Appendix B
Federal Consistency Determination

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DRAFT FEDERAL CONSISTENCY DETERMINATION FOR THE NASA WALLOPS FLIGHT FACILITY SHORELINE PROTECTION PROGRAM ENVIRONMENTAL ASSESSMENT

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VA 23337

1 Introduction

The National Aeronautics and Space Administration (NASA) has prepared an Environmental Assessment (EA) to evaluate the potential environmental effects of enhancing and protecting the shoreline on Wallops Island. NASA has prepared the EA as a document tiered from the *2010 Final Shoreline Restoration and Infrastructure Protection Program (SRIPP) Final Programmatic Environmental Impact Statement* (PEIS) with information and project components as presented in the *2013 Final Post-Hurricane Sandy Shoreline Repair EA* and the *2019 Final Shoreline Enhancement and Restoration Project EA*. The *2010 Final SRIPP PEIS, 2013 Final Wallops Island Post-Hurricane Sandy Shoreline Repair EA*, and *2019 Final Shoreline Enhancement and Restoration Project EA* are incorporated by reference with new information and analysis provided, as appropriate.

This document provides the Commonwealth of Virginia with NASA's Consistency Determination under Coastal Zone Management Act Section 307(c)(1) and Title 15 Code of Federal Regulations (CFR) part 930, Subpart C, for protecting the Wallops Island shoreline analyzed in the Shoreline Protection Program EA. The information in this Consistency Determination is provided pursuant to 15 CFR Section 930.39.

NASA requested the cooperation of Bureau of Ocean Energy Management (BOEM) and the United States (U.S.) Army Corps of Engineers (USACE), Norfolk District in preparing the Shoreline Protection Program EA and this Consistency Determination, because they possess regulatory authority or specialized expertise pertaining to the Proposed Action. NASA, as the Wallops Flight Facility (WFF) property owner and project proponent, is the lead agency and responsible for ensuring overall compliance with applicable environmental statutes, including National Environmental Policy Act (NEPA) and the Coastal Zone Management Act (CZMA).

2 Background

Some of NASA's and the Commonwealth of Virginia's most critical launch assets, including Mid-Atlantic Regional Spaceport Launch Complex and multiple sounding rocket pads are located along the Wallops Island shoreline infrastructure protection area.

On December 13, 2010, NASA issued a Record of Decision (ROD) for the WFF *2010 Final SRIPP PEIS*. The U.S. Department of the Interior's BOEM and the USACE Norfolk District were Cooperating Agencies. The primary goal of the SRIPP is to reduce direct damage to Wallops Island's infrastructure; however, its primary benefit is the continued use of the island to support the aerospace programs that are at the core of WFF's mission. The *2010 Final SRIPP PEIS* analyzed three Action Alternatives including structural and non-structural options, varying beach berm widths, and multiple sources of fill material. In

its ROD, NASA selected *Alternative 1: Full Beach Fill, Seawall Extension* and adopted a suite of mitigation and monitoring protocols to both reduce potential environmental effects and track project performance. Implementing the initial phase of Alternative 1 entailed: (1) the placement along the Wallops Island shoreline of approximately 3.2 million cubic yards of sand material dredged from Unnamed Shoal A, an offshore sand ridge located approximately 11 miles northeast of Wallops Island on the Outer Continental Shelf (OCS) in the Atlantic Ocean under BOEM jurisdiction; and (2) an initial 1,430-foot southerly extension of the Wallops Island rock seawall with future extensions completed as funds are available to a maximum length of 4,600 feet.

The *2010 Final SRIPP PEIS* ROD stated that fill material for future renourishment cycles could be taken from either OCS Unnamed Shoal A, OCS Unnamed Shoal B (another offshore sand ridge located approximately 13 miles northeast of Wallops Island), or north Wallops Island beach and left the specifics of how and when the fill material was obtained to be addressed in future action-specific NEPA documentation.

The initial beach renourishment (3.2 million cubic yards) was completed in August 2012. A second renourishment was required shortly thereafter when, in October 2012, Hurricane Sandy made landfall. Monitoring surveys following the storm event identified the need to repair a section of the seawall and the southern two-thirds of the recently nourished beach. NASA signed a Finding of No Significant Impact (FONSI) on June 6, 2013, for the *Wallops Island Post-Hurricane Sandy Shoreline Repair Final EA*. Repairs to the seawall and second beach renourishment of 650,000 cubic yards of sand were completed in September 2014. Subsequent storms in 2015 (Hurricane Joaquin), in 2016 (Winter Storm Jonas), and in 2018 (Winter Storm Riley) resulted in a reduction of over a million cubic yards of sand in the southern portion of the island as compared to volumes present after the 2014 shoreline repair.

In 2018, NASA requested the USACE Norfolk District Hydraulics and Hydrology Section to evaluate the effectiveness of constructing a breakwater or series of breakwaters along the Wallops Island shoreline to reduce the intensity of wave action and the rate of sediment transport since previous renourishments provided only temporary protection. The USACE modeled seven alternative configurations with varying placement, size, and number of breakwaters and calculated how each alternative affected shoreline stabilization and sediment transport. The analysis employed numerical modeling to determine the size and placement of breakwater(s) that would address the erosion issues. Modeling indicated the placement of detached parallel breakwater structures approximately 200 feet offshore from the mean high water (MHW) line would be most effective.

On July 16, 2019, NASA signed a FONSI for the *Final Shoreline Enhancement and Restoration Project EA* to implement a third renourishment. The project placed approximately 1.1 million cubic yards of sand sourced from the north Wallops Island beach. Prior to renourishment, a total of five breakwaters were constructed approximately 200 feet offshore from the MHW line of the Wallops Island shoreline infrastructure protection area. Two breakwaters were constructed in front of the Horizontal Integration Facility (HIF; Building X-079) and three breakwaters were constructed in front of Launch Pad 0-B.

The attached figures provide a visualization of the shoreline infrastructure protection area prior to renourishment in 2019 (**Figure 1, Enclosure 1**), post-renourishment in 2021 with the initial breakwaters in place (**Figure 2, Enclosure 1**), and in May 2023 (**Figure 3, Enclosure 1**). The recent image indicates a

noticeable retention in sand material in front of the HIF and Launch Pad 0-B north of where breakwater structures were placed in 2020/2021, and along the remaining shoreline area.

3 Description of the Proposed Action

Consistent with the Action Alternatives described in detail in the *2010 Final SRIPP PEIS*, reexamined in the *2013 Final Post-Hurricane Sandy EA*, and implemented following completion of the *2019 Final Shoreline Enhancement and Restoration Project EA*, NASA's Proposed Action would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The Proposed Action could involve a combination of the following (**Figure 4, Enclosure 1**):

- sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station;
- construction of up to 12 breakwaters in the nearshore area between the existing breakwaters; and
- repairs and extension of the existing seawall.

Shoreline stabilization activities would occur in phases, over the next seven years, depending on a number of factors, including infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in 1 year, and in another year additional renourishment, breakwaters construction, or both, could occur in another area.

3.1 Renourishment Processes

For this Proposed Action, sand material for beach renourishment would come from OCS Unnamed Shoal A. All equipment placement and laydown areas would be in areas previously surveyed.

3.1.1 Beach Fill Mobilization

The renourishment process would begin with the dredge contractor transporting equipment and materials to the project site. Offshore equipment would include several miles of discharge pipe, pump-out buoys, and multiple barges, tugboats, derricks, and smaller crew transportation vessels. It is expected that the discharge lines would be assembled inside the protected waters of Chincoteague Inlet, rafted together, and then positioned by mechanical means at their ultimate placement site, as weather conditions allow. Onshore, it is expected that sections of the discharge lines would be trucked in, staged, and placed using a front-end loader or crane. Other onshore support equipment would be trucked in and may include multiple bulldozers, several all-terrain vehicles (ATVs), an office trailer, mobile generators, construction site lighting, and mobile fuel tanks. The mobilization is expected to take 30 to 45 days. Laydown areas would be located on previously cleared areas and would not involve additional disturbance.

Once the dredge hopper is filled, the dredge would transport the material to a pump-out station that would be placed at a water depth of approximately 30 feet, approximately 2 miles offshore of the placement area. The pathway from Unnamed Shoal A to the pump-out buoy is not a straight line, but a dogleg shape with a turning point, for the purpose of avoiding Chincoteague Shoal and Blackfish Bank. The distance from the turning point to the pump-out buoy is approximately 8 miles. The one-way distance from Unnamed Shoal A to the pump-out buoy is approximately 14 miles. It is estimated that the pump-out

station would be moved up to 10 times to accommodate transit by the dredge. Booster pumps may be needed to aid the offloading of sand from the pump-out buoy to the shoreline.

3.1.2 Dredging and Sand Placement Process

Upon receipt of all necessary authorizations, the USACE (on NASA's behalf) would contract for the dredging and placement of sand. Munitions and explosives of concern (MEC) screens would be added to the drag heads of trailing hopper dredges during use. The dredging process would be cyclical in nature, with the vessel transiting to the borrow site, lowering its drag arms, filling its hopper, and returning to a discharge site. The dredge would connect to the floating end of the submerged pipeline offshore of the beach renourishment area. The sand/water slurry would be pumped from the dredge site through this pipeline to the beach. Up to several miles of submerged steel pipeline would be temporarily placed on the seafloor in areas previously cleared for cultural resources and/or on hardbottom. All dredging and equipment placement would take place in areas previously surveyed.

Nearshore, it is expected that the contractor would employ one or more anchored pump-out stations. As the sand slurry is discharged onto the shoreline, bulldozers would grade the material to the desired design template.

Dredging would be conducted in a manner consistent with the recommendations of two publications examining the effects of dredging of offshore shoals in the mid-Atlantic as presented in the *2010 Final SRIPP PEIS*. More specifically, NASA would at a minimum:

- dredge offshore sand from Unnamed Shoal A sub-area A-1 (an accretional area);
- dredge over a large area and not create deep pits;
- require that dredge cut depth not be excessive;
- require that dredging not occur over the entire length of the shoal;
- require MEC screening at the drag head;
- require a lookout bridge watch be present on the dredge at all times from April 1– November 30; and
- if a listed whale is spotted within 1 kilometer (km) (0.62 mile) of the dredge, stop dredging until the whale is farther than 1 km from the dredge.

Sand would be placed onshore along 15,000 feet of beach extending from just north of the southern property line to the north near the fire station. The tidal cycle would influence the location on the beach within which the equipment would work for a given dredge load. During low tide, the equipment would likely concentrate on the intertidal and subtidal zones, whereas, during high tide, work would be focused on the upper beach berm and dune. After each section of beach is confirmed to meet design criteria, the process would continue in the longshore direction, with sections of discharge pipe added as it progressed. At the conclusion of dredging and beach fill, the construction contractor would begin the demobilization phase of the project, the largest task of which would be the disassembly, staging, and loading of discharge piping for transport off site.

3.2 Breakwater Construction

Up to 12 breakwaters would be constructed nearshore between the two existing sets of breakwaters. Breakwaters would vary in height and width depending on the elevation of the sea bottom. Each

breakwater covers between 11,000 and 12,000 square feet of bottom, for a total of up to approximately 144,000 square feet (3.30 acres). Breakwaters could be placed in sets of 2–3 or individually, approximately 200 feet offshore. Though construction materials may vary over the life of this project, previously at Wallops Island, breakwaters have been constructed with a 6-foot layer of Type I Armor Stone, a center core of Virginia Department of Transportation (VDOT) Class II stone. Breakwaters may be placed on underlying 12-inch marine filter mattresses and/or a layer of geotextile fabric.

The specific size, number, and placement of breakwaters would be a function of available funding, local conditions, and modeling by the USACE to determine maximum effectiveness and minimizing impacts to sediment transport and hydrodynamics in the project vicinity.

Breakwater construction via barge would be consistent with that evaluated in the *2010 Final SRIPP PEIS* and *2019 Final Shoreline Enhancement and Restoration Project EA*. In 2020, fall and winter storm and surf conditions created a potential risk to personnel and equipment and the project schedule. To mitigate the risks, several breakwaters were constructed using temporary bulkheads. Under this Proposed Action, breakwater construction may include the use of barges, temporary trestle system, or temporary bulkheads. Since construction by temporary bulkhead would be the most impactful method of installing the breakwaters, this construction method has been used to analyze effects. If breakwaters are constructed by barge or temporary trestle, it is anticipated that any effects would be of a lesser magnitude than temporary bulkheads. Construction of each breakwater is estimated to take approximately 2 months. The materials and equipment would be transported by truck to and from the island via State Road 803 to South Bypass Road to a staging area. The staging area location and size would be the same as was established in 2021 and used during construction of the temporary bulkhead.

3.2.1 Build Breakwaters by Barge

The rocks and other materials for constructing each breakwater would be transported to the breakwater construction area by rail, offloaded, and then barged to the handling or placement site offshore of Wallops Island. Placement would occur in the water using a barge and heavy lifting equipment. These breakwaters would be permanent structures as removal would be impractical and cost prohibitive.

3.2.2 Build Breakwaters using Temporary Bulkheads

The equipment would be transported via truck from contractor staging sites and delivered through the Wallops Island gate into the staging area (as described above). The existing access would be maintained with gravel to minimize any effect to the NASA Erosion and Sediment Control plan. The installation of temporary bulkhead structures would be through using a steel sheet pile. Each temporary bulkhead would be roughly 130 feet long by 30 feet wide and use approximately 1,000 cubic yards of temporary sand (same as used for beach fill) per access. All equipment and remaining materials after installation would be trucked off-site to the contractor staging area. The process of building each breakwater using temporary bulkheads would include the following steps or similar:

- place equipment (e.g., crawler crane, hydraulic excavator, and vibratory hammer) and material (e.g., steel sheet piles, timber mats, high density polyethylene mats, marine mattresses, armor stone, and core stone) in the staging area;
- fill a sand template;

- install steel pilings using vibratory hammer and crane to create wall (i.e., bulkhead) at each breakwater location;
- place mats and marine mattress;
- transfer armor stone and core stone from staging area to placement site per design plan; and
- extract steel pilings using vibratory hammer and crane, move to the next breakwater location, and repeat the construction process.

3.2.3 Build Breakwaters using Temporary Trestle System

The breakwater materials and construction equipment would be transported by truck to and from the island via State Road 803 to South Bypass Road to a staging area (as described above). The process to build each breakwater using a temporary trestle system would include each of the steps listed above, with the exception of creating a bridge (i.e., trestle) at each breakwater location. Instead, a series of steel pilings would be installed and beams placed across the top of the piles to form temporary piers. Once the piers were constructed, beams would be placed and span pier to pier with the beam placement aligning with the chosen crane/lifting equipment's track or wheelbase. The system would be designed as 30 feet to 40 feet wide with decking material comprised of crane mats and would be placed next to the breakwater location. Following construction of the last breakwater, the steel pilings would be removed using vibratory hammer and crane and placed in the staging area prior to transport off site.

3.3 Seawall Repair and Extension

The existing rock seawall is located along 15,900 feet of the Wallops Island shoreline. Construction of this seawall began in 1992 and continues to protect WFF infrastructure within the eroding portion of the shoreline from damage due to storms and large waves. The wall has prevented overwash and storm damage, but erosion of the shoreline seaward of the wall has continued, resulting in an increased risk of damage to the seawall and the missions and infrastructure it protects. The SRIPP analyzed potential effects from repairing and extending the seawall to a maximum length of 4,600 feet south of its southernmost point. During the first SRIPP cycle, the seawall was extended approximately 1,430 feet south with the premise that the remaining 3,170-foot extension would be implemented with future funding. The seawall extension would consist of the placement of rocks weighing approximately 5 to 7 tons on a 1 to 1.5 slope. The top of the seawall would be approximately 14 feet above the normal high-tide water level after completion, depending on the extent of existing shoreline retreat at that time. The seawall may be repaired at any location.

3.4 Construction Monitoring

Should work be conducted between March 15 and August 31, NASA would ensure that the work site and adjacent areas would be surveyed for nesting birds and sea turtles by a biological monitor on a daily basis. Survey protocols would be the same as those developed for the initial beach fill and seawall extension. The biological monitor would coordinate directly with on-site project employees to ensure that all parties are made aware of nesting status and the potential need to suspend or relocate work activities within 1,000 feet of a nest until chicks have fledged and/or sea turtles have hatched.

Beach profile monitoring of the project site would continue to be conducted biannually, in the spring and fall (or as funding allows) of the previously constructed beach and breakwaters.

4 Consistency Determination

The Commonwealth of Virginia has developed and implemented a federally approved Virginia Coastal Resources Management Program encompassing 12 enforceable policies, which were updated as part of a program change approved by the National Oceanic and Atmospheric Administration (NOAA) on October 2, 2020. The Virginia Coastal Resources Management Program is administered by the Virginia Department of Environmental Quality (VDEQ) and consists of a network of state agencies and local governments that regulate Virginia's coastal zone lands and resources.

Full definitions and administrative agencies for each enforceable policy of the Virginia Coastal Zone Management Program are described in the *Virginia Coastal Zone Management Program Enforceable Policies* (VDEQ, 2021).

NASA finds that the project activities proposed and evaluated under the *Shoreline Protection Program EA* are consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Resources Management Program. Consistencies with each of the enforceable policies of the CZMP are addressed below:

I. Tidal and Non-Tidal Wetlands

Consistent to the Maximum Extent Practicable? N/A

Project activities would not impact wetlands with the Project Area. This enforceable policy is not applicable to the Proposed Action.

II. Subaqueous Lands

Consistent to the Maximum Extent Practicable? YES

The proposed renourishment would affect existing subaqueous areas in the nearshore ocean environment. Elevated turbidity in marine waters would occur during and immediately after beach fill and breakwater construction. Correspondence with VMRC indicated they would issue new permits for beach renourishment. The Proposed Action would be consistent with this enforceable policy.

III. Dunes and Beaches

Consistent to the Maximum Extent Practicable? YES

The project would restore the previously constructed dune system. NASA's Proposed Action would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. As discussed above under Subaqueous Lands Management, VMRC indicated they would issue new permits for beach renourishment. The Proposed Action would be consistent with this enforceable policy.

IV. Chesapeake Bay Preservation Areas

Consistent to the Maximum Extent Practicable? N/A

The project would not include land development activities that would impact the Chesapeake Bay or its tributaries. Moreover, although Accomack County has adopted the Chesapeake Bay Preservation Act

restrictions for its seaside riparian areas, NASA's Wallops Island is specifically excluded from this overlay area. This enforceable policy is not applicable to the Proposed Action.

I. Marine Fisheries

Consistent to the Maximum Extent Practicable? YES

There would be short-term site-specific adverse effects on fish habitat within the fill placement and breakwater construction areas due to temporary burial of existing benthic habitat and increased levels of turbidity during and immediately after sand placement. Benthic habitats would recover post-project. The duration of beach renourishment would be temporary in nature, with turbidity on the order of hours and benthic recovery on the order of several seasons. Recovery from breakwater construction could begin almost immediately after completion of the action. Most motile fish species are attracted to structures, and the breakwaters would likely cause localized increases in fish density. The Proposed Action would be consistent with this enforceable policy.

II. Wildlife and Inland Fisheries

Consistent to the Maximum Extent Practicable? YES

Effects on wildlife and inland fisheries would primarily occur from habitat disturbance well as disturbance and displacement by fill and construction activities.

Dredging Unnamed Shoal A would be done in a way to not substantially change shoal topography and to minimize the effect to the availability of seabird food sources. Though the additional dredging would increase the water depths at the borrow area, diving species could still effectively forage on the shoal. Sand would be removed within areas already disturbed; therefore, it would not expand the footprint of the area. Both adjacent undisturbed areas on Unnamed Shoal A and neighboring shoals would provide adequate forage should seabirds avoid the directly affected area. Additionally, effects from disturbance would be limited to that active dredging phase.

Temporary noise and visual disturbances could adversely affect beach foraging and nesting birds and sea turtles during sand excavation, seawall repair and construction, and placement and breakwater construction. Direct effects could include eliciting a startle or flee response, which could temporarily interrupt feeding activities or cause individuals to relocate to other areas of the beach. However, if activities occur during the nesting season, a biological monitor would survey the area daily and 1,000-foot nest buffers would be established around federally-listed piping plover and loggerhead sea turtle nests to prevent direct effects to nests.

The breakwaters would alter the nearshore bottom and create adverse effects from direct disturbance during construction. After construction, the breakwaters would potentially provide resting and foraging areas for avifauna. It is unlikely that the breakwaters would contribute to any lasting negative effects to wildlife.

The Proposed Action would not prevent or delay the continued propagation of any population, community, or species. The Proposed Action would be consistent with this enforceable policy.

III. Plant Pests and Noxious Weeds

Consistent to the Maximum Extent Practicable? N/A

The project would not involve violation of any quarantine established by the Board of Agriculture and Consumer Services or the Commissioner of Agriculture and Consumer Services, nor would it involve the importation of any infested regulated articles that could endanger public health. This enforceable policy is not applicable to the Proposed Action.

IV. Commonwealth Lands

Consistent to the Maximum Extent Practicable? YES

The project would be implemented within Commonwealth Lands owned, operated, or otherwise under the jurisdiction of the Virginia Marine Resources Commission (VMRC). Areas under the Proposed Action including the pumpout buoy area, the beach renourishment area, and the construction of offshore breakwaters would all occur in Commonwealth lands. However, the Proposed Action would not result in permanent loss of navigation, public access, or other authorized uses of Commonwealth Lands and the Proposed Action would be implemented in accordance with applicable standards and permit conditions. The Proposed Action would be consistent with this enforceable policy.

V. Point Source Air Pollution

Consistent to the Maximum Extent Practicable? YES

Use of fossil fuel-burning equipment for construction of the nearshore breakwaters and the movement of sand would generate emissions of both criteria pollutants and greenhouse gases. However, the project activities would not violate federal or Virginia air quality standards. Emissions would not be considered significant under the Proposed Action, as they are below major source HAP thresholds and not in violation of the NAAQS for any criteria pollutant. The Proposed Action would be consistent with this enforceable policy.

VI. Point Source Water Pollution

Consistent to the Maximum Extent Practicable? N/A

The project would not involve a new point source discharge to Virginia waters. This enforceable policy is not applicable to the Proposed Action. This enforceable policy is not applicable to the Proposed Action.

VII. Nonpoint Source Water Pollution

Consistent to the Maximum Extent Practicable? YES

Project activities have the potential to increase non-point source runoff to the Atlantic Ocean. Sand placement in the shoreline infrastructure protection area could have short-term, minor effects on nearshore water quality resulting from the accidental release of petroleum products, or other contaminants from construction vehicles and heavy equipment used to transport and deposit the sand. The potential for such construction-related effects to occur would be minimal as contractors would implement BMPs for

vehicle and equipment fueling and maintenance, as well as site-specific spill prevention and control measures. The Proposed Action would be consistent with this enforceable policy.

VIII. Shoreline Sanitation

Consistent to the Maximum Extent Practicable? N/A

The project would not involve the construction of septic tanks or sewage systems. This enforceable policy is not applicable to the Proposed Action.

According to information provided in the Federal Consistency Determination and Draft EA, the Proposed Action would have no effect on the following enforceable policies: tidal and non-tidal wetlands; Chesapeake Bay preservation areas; plant pests and noxious weeds; point source water pollution; and shoreline sanitation.

Based on the analysis presented above, and the more detailed analysis presented in the Draft EA, NASA has determined that the Proposed Action described herein would be consistent with the Enforceable Policies of the Virginia Coastal Zone Management Program. The Proposed Project is consistent with the following enforceable policies: subaqueous lands; dunes and beaches; marine fisheries; wildlife and inland fisheries; Commonwealth lands; point source air pollution; and nonpoint source water pollution.

The applicable policies are fully consistent because NASA would ensure that the project is constructed and operated in accordance with all applicable federal, state, and local laws and regulations.

Pursuant to 15 CFR section 930.41, the Virginia Coastal Resources Management Program has 60 days from the receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR section 930.41(b). Virginia's concurrence will be presumed if its response is not received by NASA on the 60th day from receipt of this determination. The Commonwealth's response should be sent to:

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division

(757) 824-2327
Shari.A.Miller@nasa.gov

References:

NASA. 2010. Final Programmatic Environmental Impact Statement for Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Programs. October. Available online at: https://www.nasa.gov/goddard/memd/nepa/shoreline/#documents.

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NASA. 2025. Preliminary Draft Environmental Assessment. NASA WFF Shoreline Protection Program. June.

USACE. 2018. Breakwater(s) Analysis, Design, and Modeling Report for National Aeronautics and Space Administration Goddard Space Flight Center Wallops Flight Facility. May.

USFWS. 2019. Wallops Flight Facility Update and Consolidation of Existing Biological Opinions, Accomack County, VA. Project # 2015-F-3317. June 7.

VDEQ. 2021. Virginia Coastal Zone Management Program Enforceable Policies.

5 Enclosure 1

Figure 1 Shoreline Infrastructure Protection Area in 2019 Before Breakwater Construction and Renourishment (Photo courtesy of Patrick J. Hendrickson)

Figure 2 Shoreline Infrastructure Protection Area in 2021 After Breakwater Construction and Renourishment (Photo courtesy of Patrick J. Hendrickson)

Figure 3 Shoreline Infrastructure Protection Area in 2023 (Photo courtesy of Patrick J. Hendrickson)

Figure 4 Project Area and Components

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

www.deq.virginia.gov

David L. Bulova
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director

March 26, 2026

Ms. Shari Miller
NASA Goddard Space Flight Center
Sent via email: gsfc-dl-nepa@mail.nasa.gov

RE: National Aeronautics and Space Administration (NASA) Draft Environmental Assessment and **Federal Consistency Determination Conditional Concurrence**: NASA Wallops Flight Facility Shoreline Protection Program (DEQ 26-015F)

Dear Ms. Miller:

The Commonwealth of Virginia has completed its review of the draft Environmental Assessment (EA) and a federal consistency determination (FCD) for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating state reviews of FCDs submitted under the Coastal Zone Management Act. This letter is in response to the above-referenced EA and FCD that were received on January 21, 2026. DEQ conditionally concurs that the project is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Zone Management (CZM) Program (see page 3). The following agencies participated in this review:

Department of Environmental Quality
Department of Wildlife Resources
Department of Conservation and Recreation
Department of Health
Department of Historic Resources
Virginia Marine Resources Commission
Virginia Institute of Marine Science

The Virginia Department of Agriculture and Consumer Services, Accomack County and Accomack-Northampton Planning District Commission also were invited to comment.

PROJECT DESCRIPTION

The National Aeronautics and Space Administration (NASA) submitted a draft EA and FCD for the construction of shoreline protection measures at NASA Wallops Flight Facility (WFF) on Wallops Island (Accomack County). The proposed action would implement the following measures to protect the beach along the Wallops Island shoreline infrastructure protection area:

- Sand renourishment within an approximate 15,000-foot long section of shoreline from the south property line on Wallops Island north to the location of the fire station
- Construction of up to 12 breakwaters in the nearshore area between the existing breakwaters
- Repairs and extension of the existing seawall

The shoreline stabilization activities would occur in phases over the next seven years, depending on infrastructure prioritized for protection, the pace and location of erosion, and the availability for funding. Sand material for beach renourishment would be dredged from Outer Continental Shelf Unnamed Shoal A. All equipment and laydown areas would be in areas previously surveyed.

The draft EA is a Tiered EA based on the 2010 Final Shoreline Restoration and Infrastructure Programmatic Environmental Impact Statement. The January 2026 draft EA evaluates the No Action Alternative, Alternative 1: Beach Renourishment and Breakwater Construction (proposed action), Alternative 2: Beach Renourishment and Alternative 3: Breakwater Construction.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

This FCD is submitted pursuant to the federal consistency regulation 15 Code of Federal Regulations Part 930 Subpart C Section 930.31. Pursuant to the Coastal Zone Management Act of 1972, as amended, 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, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Zone Management (CZM) Program. The Virginia CZM Program consists of a network of programs administered by several agencies. In order to be consistent with the Virginia CZM Program, the project activities must be consistent to the maximum extent practicable with the enforceable policies of the Virginia CZM Program and all the applicable permits and approvals listed under the enforceable policies of the Virginia CZM Program must be obtained prior to commencing the project. DEQ coordinates the review of FCDs with agencies administering the enforceable and advisory policies of the Virginia CZM Program.

Federal Consistency Public Participation

In accordance with 15 CFR §930.2, a public notice of this proposed action was published in the DEQ Office of Environmental Impact Review Program Public Notice Bulletin and on the DEQ website from January 26, 2026 to February 23, 2026. No public comments were received in response to the notice.

Federal Consistency: Conditional Concurrence

Based on DEQ's review (which commenced January 21, 2026) of the FCD and the comments submitted by agencies administering the enforceable policies, DEQ conditionally concurs that the proposal is consistent to the maximum extent practicable with the enforceable policies of the Virginia CZM Program provided it complies with all the applicable permits, approvals, and conditions of the enforceable policies of the Virginia CZM Program. DEQ's decision is due on April 5, 2026.

Conditions which must be satisfied for the project to be consistent to the maximum extent practicable with the Wildlife and Inland Fisheries Enforceable Policy, which is administered by the Department of Wildlife Resources (DWR):

1. Consult with NOAA Fisheries on the verification of the sea-turtle take calculation to ensure take is appropriately addressed.

2. Ensure the presence of onboard protected species observers (PSO) during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.

3. Ensure that the "bridge lookout" is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 kilometer, irrespective of species, and vessel speed is dropped to below 14 knots.

4. Should renourishment activities be scheduled between March 15 and August 31 of any year, adhere to the following modifications and additions to protocols in Wallops Flight Facility's Protected Species Monitoring Plan to avoid significant adverse impacts upon listed/designated Species of Greatest Conservation Need (SGCN) resulting from the proposed activities:

    a) Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.

b) All project activities within 1,000 feet of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory**.**

c) If a sea turtle crawl is detected, the biological monitor should notify DWR immediately and take close-up photographs of the crawl and all areas where the turtle appeared to dig. Allow DWR to confirm the presence of eggs based on the photographs received from the biological monitor. If eggs are found, allow DWR to provide on-site instructions on nest and hatchling management.

d) NASA will monitor Wallops Island beach twice a day during active construction events, once in the morning for nest and brood status and again in the afternoon, to the maximum extent practicable (barring bad weather events, launch hazards, etc.). Afternoon monitoring will focus on adjusting the barrier locations, if needed, based upon nest (or renest) and brood locations.

Reasons that the conditions are necessary to ensure consistency with the Wildlife and Inland Fisheries Enforceable Policy:

If the federal agency does not adhere to the above-referenced conditions, then the project would be inconsistent with the wildlife and inland fisheries enforceable policy for the following reason:

- The proposed activities, if occurring without the conditions, may adversely impact shorebirds, seabirds, marine mammals, and sea turtles, which are protected species in the Commonwealth of Virginia.

Additional Information

If the requirements of paragraphs (a)(1) through (3) of Section 930.4 of the federal consistency regulations are not met, then all parties shall treat the state agency's conditional concurrence letter as an objection pursuant to the applicable subpart.

In addition, in accordance with 15 CFR Part 930, subpart C, § 930.39(c), DEQ encourages the federal agency to consider the advisory policies of the Virginia CZM Program. Other state approvals which may apply to this project are not included in this FCD. Therefore, the federal agency must also ensure that this project is constructed and operated in accordance with all applicable federal, state and local laws and regulations.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Wildlife and Inland Fisheries. The FCD (page 8) states that effects on wildlife and inland fisheries would primarily occur from habitat disturbance as well as disturbance and displacement by fill and construction activities. If activities occur during the nesting season, a biological monitor would survey the area daily and 1,000-foot nest buffers would be established around federally listed piping plover and loggerhead sea turtle nests to prevent direct effects to nests.

1(a) Agency Jurisdiction. The Virginia Department of Wildlife Resources (DWR), as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state- or federally listed endangered or threatened species, but excluding listed insects (Virginia Code, Title 29.1). DWR is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 US Code §661 et seq.) and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DWR determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce or compensate for those impacts. For more information, see the DWR website at https://dwr.virginia.gov/.

1(b) Agency Findings.

Shoreline Stabilization Design Models

In early 2024, DWR entered into a 5-year contractual agreement with NASA to conduct ecological and geophysical shoreline studies for the specific purpose of informing future shoreline stabilization project designs. To date, the following four reports containing data collected by the geophysical team have been published:

- Bemelmans, C.B., Stalk, C.A., Ciarletta, D.J., and Miselis, J.L. (2025). Coastal multibeam bathymetry and backscatter data collected in June 2024 from Wallops and Assawoman Islands, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P14SGUMT.
- Forde, A.S., Stalk, C.A., Ciarletta, D.J., and Miselis, J.L. (2025). Chirp sub-bottom profile geophysical data collected in 2024 from Wallops Island and Assawoman Island, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P1NZ6CC2.
- Kivimaki, K.E., Hein, E.A., and Hein, C.J., (2025). Dataset: Shorelines of Wallops and Assawoman Islands, Virginia, 2016-2025: William & Mary, data release, https://doi.org/10.25773/5ys8-cs64.
- Lyons, E.O., Bernier, J.C., Nick, S.K., Ciarletta, D.J., and Miselis, J.L. (2025). Coastal single-beam bathymetry and beach elevation data collected in 2024 from Wallops and

Assawoman Islands, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P1HFYGE6.

Due to the immediacy of the upcoming project cycle, none of the newly published data was incorporated in the 2027 project design. Instead, NASA continued to rely solely on traditional models developed by the U.S. Army Corps of Engineers.

Extension of Existing Seawall

One of the proposed actions covered in this EA is the extension of the existing 15,900-foot long rock seawall by another 3,170 feet. This will increase the length of beach that will undergo severe erosion, require additional breakwaters to slow down the loss of sand, and increase the amount of shoreline in need of renourishment. It is also not clear how the seawall extension will affect Assawoman Island, which is attached to Wallops, or any of the other islands to the south.

Biological Monitoring of Offshore Project Activities

DWR states that renourishment activities will entail dredging sand from Unnamed Shoal A, which is an unvegetated, offshore sand ridge located roughly 7 miles east of Assateague Island and approximately 1,800 acres in size. If dredging occurs when water temperatures are above 50°F (10°C), there is chance sea turtles will be in the area. In lieu of having protected species observers onboard during dredging operations, NASA assumes a total take of 2.165 federally and state-listed threatened Loggerhead sea turtles and 0.24 federally and state-listed endangered Kemps Ridley sea turtles.

The presence of onboard protected species observers (PSO) is one of several reasonable and prudent measures in the most recent National Marine Fisheries Service Biological Opinion (NMFS 2018). On hopper dredges outfitted with munitions and explosives of concern, the PSO primary responsibility is to look for impinged sea turtle carcasses/parts on the draghead every time it is removed from the water. Additionally, PSO can also look for live sea turtles in the area while the dredge is operating and alert the operator if any are detected. It is not clear in the EA if PSO will be onboard during the upcoming dredging cycle.

The EA states a “bridge lookout” would be onboard the hopper dredge to look for federally listed whale species. It is not clear whether this individual will be a trained PSO or a member of the dredge crew. When a listed whale is spotted within 1 kilometer (km) (0.62 mile) of the dredge, dredging operations will cease until the whale is farther than 1 km from the dredge. Should an individual be detected within 1.60 km (1 mile) of the vessel, the vessel will be required to reduce speed to below 14 knots. Lastly, the vessel must maintain a minimum 500-foot buffer to any North Atlantic right whales.

Biological Monitoring of Onshore Project Activities

Should renourishment activities be scheduled between March 15 and August 31, NASA will ensure that a qualified biological monitor conducts daily surveys of the project site and adjacent areas to detect nesting piping plovers and sea turtles, in accordance with Wallops Flight Facility's Protected Species Monitoring Plan. If piping plover or sea turtle nests are identified, the nests will be clearly marked using exclosures or signage and rope barriers encircling each site. A qualified biological monitor would conduct daily nest inspections. All on-site personnel would be informed of the nesting status, and all project activities within 1,000 feet of a nest would be suspended or relocated until hatching is complete.

1(c) Conditions for Consistency.

1. Consult with NOAA Fisheries on the verification of the sea-turtle take calculation to ensure take is appropriately addressed.

2. Ensure the presence of onboard protected species observers (PSO) during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.

3. Ensure that the "bridge lookout" is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 kilometer, irrespective of species, and vessel speed is dropped to below 14 knots.

4. Should renourishment activities be scheduled between March 15 and August 31 of any year, adhere to the following modifications and additions to protocols in Wallops Flight Facility's Protected Species Monitoring Plan to avoid significant adverse impacts upon listed/designated Species of Greatest Conservation Need (SGCN) resulting from the proposed activities:

    a) Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.

    b) All project activities within 1,000 feet of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory**.**

    c) If a sea turtle crawl is detected, the biological monitor should notify DWR immediately and take close-up photographs of the crawl and all areas where the turtle appeared to dig. Allow DWR to confirm the presence of eggs based on the photographs received from the biological monitor. If eggs are found, allow DWR to

provide on-site instructions on nest and hatchling management.

d) NASA will monitor Wallops Island beach twice a day during active construction events, once in the morning for nest and brood status and again in the afternoon, to the maximum extent practicable (barring bad weather events, launch hazards, etc.). Afternoon monitoring will focus on adjusting the barrier locations, if needed, based upon nest (or renest) and brood locations.

1(d) Agency Recommendations. DWR has the following recommendations:

- Shoreline Stabilization Design Models: DWR strongly encourages NASA to begin engaging with both the geophysical and ecological teams immediately through a structure decision making process or similar approach to (1) establish robust channels of communication and information exchange between the shoreline studies teams and NASA project designers and (2) ensure that alternative project designs are developed and considered in forthcoming stabilization efforts covered under this EA and future assessments.

- Extension of Existing Seawall: DWR recommends delaying this action until the ecological and geophysical shoreline studies are complete and the information gathered can be incorporated into the seawall extension decision making process.

1(e) Coordination Summary. DWR requested that NASA adhere to conditions to protect wildlife, primarily shorebirds and listed sea turtles, in order for the project to be consistent to the maximum extent practicable with the wildlife and inland fisheries enforceable policy. NASA responded March 11 and accepted most of the conditions but rejected five of them. NASA said that two of them overlap with its U.S. Fish and Wildlife Service (FWS) Biological Opinion requirements and offered an alternative for the three others. In response, DWR requested clarification on delineating boundaries around nests on the beach and agreed to remove three of its conditions, rejected by NASA, if NASA accepted one new condition regarding the monitoring of brood locations. NASA provided the clarification (email, March 19, 2026, attached), as requested, and agreed to DWR's new condition with some modifications. On March 25, 2026 (email), DWR agreed to NASA's modification regarding the monitoring of brood locations, and NASA accepted the final list of conditions (Item 1(c)).

1(f) Conclusion. Assuming adherence to the conditions identified in Item 1(c) and strict adherence to best management practices for erosion and sediment control is maintained, DWR conditionally concurs that the project is consistent to the maximum extent practicable with the wildlife and inland fisheries enforceable policy.

2. Subaqueous Lands. The FCD (page 7) states that the proposed renourishment would affect existing subaqueous areas in the nearshore ocean environment. Elevated turbidity in marine waters would occur during and immediately after beach fill and breakwater construction. Correspondence with VMRC indicates that the agency would issue new permits for beach renourishment.

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission (VMRC) regulates encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia Code §28.2-1200 through 1400, as well as sharing jurisdiction for tidal wetlands with DEQ. For nontidal waterways, VMRC states that it has been the policy of the Habitat Management Division to exert jurisdiction only over the beds of perennial streams where the upstream drainage area is 5 square miles or greater. The beds of such waterways are considered public below the ordinary high water line mark. However, in nontidal waters where a Virginia Water Protection (VWP) permit or coverage is obtained issued for in-stream activities, a VMRC permit is not required in certain circumstances (Memorandum of Agreement between VMRC and DEQ for Implementation of 2023 Va. Acts Chs. 258 and 259 Regarding Permitting in Non-tidal Waters of the Commonwealth (Amd 8/23)).

2(b) Requirement. VMRC states that the placement of sand and construction of breakwaters on state-owned submerged lands will require a permit.

2(c) Comments from VIMS. It is VIMS' understanding that the subaqueous portion of the project will require a permit from the VMRC, and VIMS anticipates reviewing that application once it is submitted. More extensive comments and recommendations from VIMS are available in Item 4(c) and 4(d) below.

2(d) Conclusion. Provided the project adheres to the requirements, including any necessary special conditions, of the applicable permit, the project would be consistent to the maximum extent practicable with the subaqueous lands enforceable policy.

3. Marine Fisheries. The FCD (page 8) states that there would be short-term, site-specific adverse effects on fish habitat within the fill placement and breakwater construction areas; however, benthic habitats would recover post-project.

3(a) Agency Jurisdiction. The marine fisheries enforceable policy stresses the conservation and promotion of seafood and marine resources of the Commonwealth, including fish, shellfish and marine organisms, and manage 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*).

3(b) Agency Findings. VMRC states that no private shellfish leases or public Baylor grounds are present within or adjacent to the project area. Impacts to fisheries within Virginia's territorial waters are anticipated to be minor to negligible.

3(c) Conclusion. As proposed, the project is consistent to the maximum extent practicable with the marine fisheries enforceable policy.

4. Dunes and Beaches. The FCD (page 7) states that the project would restore the previously constructed dune system. NASA anticipates that VMRC will issue new permits for beach renourishment.

4(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*).

4(b) Requirement. While federal properties are not part of Virginia's designated Coastal Zone, a dune and beach permit may be required from VMRC since the proposed activities may affect other areas within the Coastal Zone.

4(c) Comments from VIMS. VIMS serves as an advisory agency to VMRC. VIMS scientists have been engaged by NASA (through DWR) in the ongoing Shoreline Resiliency Study (SRS; from 2024–2029), which aims to evaluate both physical and ecological responses to shoreline stabilization actions and inform future actions. The information presented here is a combination of VIMS' existing scientific knowledge and site-specific observations and data.

Wallops Island is unique among the Virginia Eastern Shore barrier islands as it is the only island to use hard structures on the open Atlantic Ocean shoreline to combat erosion. The use of hard structures is necessary to continue the safe launches of rockets from WFF while minimizing risks to nearby human populations and infrastructure. This requires that launch pads are located at the southern portion of the island, which is also where erosion is greatest. Accelerated erosion on southern Wallops Island is largely attributed to a nodal zone where longshore currents diverge, driving sediment both to the north and south. This is because the southern "hook" of Assateague Island is approximately three miles seaward of the northern approximately two miles of Wallops Island. This causes dominant northeast wind-driven waves to refract around southern Assateague to set up the nodal zone on Wallops Island. It is this longshore current divergence that has caused the greatest erosion of the island at the location of the launch pads and accretion of sediment at the northern end of the island. Preliminary analysis of SRS data indicates that the nodal zone is currently centered near the location of the southern set of existing breakwaters and that it shifts seasonally by approximately one half mile along the beach, following regional wave patterns

(see figures 1A and 1C, attached, for the shoreline evolution landward of the breakwater sets that indicates dominant longshore sediment transport to the north). This indicates that sand currently trapped by the breakwaters is mostly that which would otherwise be transported to the north rather than being transported south to Assawoman Island and beyond.

VIMS submitted scoping comments for this proposed project (February 15, 2024, attached) and while VIMS comments were adequately summarized in the EA, they were not adequately addressed as indicated in the Summary of Scoping Comments (table 1.5-1). The following is a summary of VIMS' scoping comments (in italics) and how they were/were not addressed in the EA.

1. *Evaluate the previous shoreline stabilization action to inform the proposed design:* A discussion of previous shoreline stabilization actions was discussed in section 1.0; however, only brief qualitative information and three oblique aerial photos are presented regarding the effectiveness of the previous project.

2. *Model alternatives with and without beach nourishment:* The summary table indicates this will be addressed in section 2.0 though that is not the case. Section 3.2.2. mentions that breakwaters would be located "closer to the existing shoreline" if beach nourishment did not occur, but no specific information regarding their placement or modeling of this scenario is presented.

3. *Evaluate the sand borrow area at the north end of the island to determine if restoration is warranted*: This comment is not included in the summary table. The borrow area is discussed in section 2.4.1 as an alternative that was not carried forward for this round of construction, though it may be considered for future projects. Noted in this section is that the beach borrow area was anticipated to recover in about five to six years after its use for the 2020/2021 project (as indicated in the 2019 final EA), though to date, the borrow area remains a shallow tidal lagoon fronted by a barrier beach.

4. *Evaluate breakwater alignments at the existing locations (200 feet offshore) and closer, attached breakwaters to determine optimal structure location for sediment trapping and shoreline stabilization*: The summary table indicates this comment is addressed in section 2.2.2. That section discusses the construction method alternatives for the breakwaters but does not indicate that any alignment other than 200 feet from the shoreline was considered. Modeling is mentioned but no results are presented and the citation (USACE 2025) referenced in the text is listed in the references section as "U.S. Army Corps of Engineers (USACE). 2025. TBD – design and modeling report." The information that is assumed to be included in this report is invaluable to VIMS' review of this project. Several VIMS scientists participated in the Second Annual Wallops Shoreline Studies Meeting on January 13, 2026 where USACE representatives presented an overview of the numerical modeling conducted for this project. That presentation

indicated that modeling was only conducted for breakwaters located 200 feet from the shoreline and in various groupings.

5. *Modeling of the system should be regional to more accurately represent the system:* As above, the USACE modeling report was not available, and the EA did not discuss the model setup or results; however, the January 13 presentation showed that the area modeled for waves, currents, and winds included Assawoman and southern Assateague islands.

In addition to the recommendations and concerns raised in VIMS' scoping comments, VIMS offers the following comments based on the information presented in the documentation provided.

A. As reported in the EA, the median grain size found on the Wallops beach in 2007 and 2009 was 0.18–0.27 mm and immediately after nourishment from unnamed shoal A, the median grain size was coarser at 0.28–0.54 mm. SRS quarterly sampling along the mid-beach from October 2024 to July 2025 shows a median grain size of 0.26 mm with a range of 0.19–0.40 mm. Taking the post-nourishment values as proxy for the sediment composition of the shoal, that sediment remains slightly coarser than what is currently on the beach and is therefore appropriate for nourishment at this site.

B. In October 2025 a section of the dune field proximal to the fire station was graded flat to allow for the Navy to install an antenna array (figure 2, attached). The southwest corner of this area extends through the primary dune and into the upper beach. This lower elevation could act as a surge channel during high water events.

C. The detached breakwaters are functioning to hold sand in salients and have resulted in a wider beach landward of them.

D. The revetment extension to the south is likely to result in continued narrowing of that portion of the beach, as has occurred in the area between the breakwater sets (figure 1C, attached).

E. Longshore sediment transport occurs predominantly from south to north beginning near the southern breakwater set and continuing northward.

F. As Wallops Island continues to be held in place, Assawoman Island continues to move landward through natural overwash processes. Over time, Assawoman is likely to become offset landward from Wallops at the southernmost extent of the revetment, similar to the southern end of Long Beach Island, NJ at the northern end of Forsythe National Wildlife Refuge. Currently, the beach seaward of camera Z-100 has narrowed such that it is not typically exposed at high tide. As Assawoman migrates, Hog Creek

> may again connect to the ocean, recreating a tidal inlet between the islands that was last open in 1986.

In summary, VIMS states that the proposed shoreline protection strategy does not adequately consider lessons learned from the previous project built 2020–2021, and while the SRS is not complete, there are preliminary findings regarding both the physical and ecological current conditions and response to the previous project that can help inform this seven-year project.

4(d) Recommendations from VIMS.

Regarding Item B above, to reduce risk, VIMS recommends building and planting dunes along this wider section of beach to prevent waves/water from reaching the antenna array or the existing revetment.

Regarding Item C above, VIMS recommends that future structures are aligned closer to shore to both reduce the footprint required (and therefore the volume of rock needed) and increase their shoreline stabilization functionality. Attached breakwaters that are nourished at the time of construction reduce the wave energy that reaches the shoreline and more effectively hold sediment in tombolos as compared with detached breakwaters. This means subsequent beach nourishment cycles can be extended or eliminated, reducing future impacts.

Regarding Item D above, as the nodal zone of divergent sediment transport likely extends into that area, at least seasonally, VIMS recommends careful monitoring after the revetment is extended to determine if additional breakwaters are warranted to the south of the existing southern set to adequately protect this reach while still minimizing impacts to sediment transport to Assawoman Island.

Regarding Item E above, VIMS recommends breakwaters be constructed from south to north to best retain beach nourishment material over time if they are not constructed at the same time.

4(e) Conclusion. Provided the project adheres to the requirements or any special conditions of a VMRC permit, the project would be consistent to the maximum extent practicable with the dunes and beaches enforceable policy.

5. Water Quality and Wetlands. The FCD (page 7) states that the project would not affect wetlands. Under the proposed action, the draft EA (page 3-7) states that beach replenishment activities would have temporary, minor effects on offshore water quality. Construction-related effects from breakwaters would be considered temporary and not likely to be adverse. Seawall repair and extension activities would have short-term, minor effects on nearshore water quality.

5(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 activities in state surface waters including wetlands, and certain surface water withdrawals, diversion, and impoundments. It also may serve as Section 401 Water Quality Certification of the federal licenses and permits under the Clean Water Act. The VWP Permit Program is under the Office of Wetlands and Stream Protection, within the DEQ Division of Water Permitting. Six DEQ regional offices perform permit application reviews and issue permits or coverages for the covered activities.

- Clean Water Act Sections 404 and 401 (33 U.S.C. § 1251 *et seq*.);
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90) (40 CFR Part 230);
- State Water Control Law, Chapter 3.1 of Title 62.1 of the Code of Virginia; and
- State Water Control Board regulations 9VAC25-210 *et seq*.; 9VAC25-660 *et seq*.; 9VAC25-670 *et seq*.; 9VAC25-680 *et seq*; and 9VAC25-690 *et seq*.

5(b) Requirements. The DEQ Tidewater Regional Office (TRO) states that potential adverse impacts to water quality and wetlands resulting from surface runoff due to construction activities must be minimized, which 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*.

DEQ TRO Wallops Flight Facility currently discharges stormwater under VPDES Permit Number VA0024457. There does not appear to be any point source discharges of processed water or wastewater associated with this project that would necessitate a change to the VPDES permit.

5(c) VMRC Comments. VMRC states that there are no tidal or non-tidal wetlands in close proximity to the project area.

5(d) Conclusion. Provided adherence any applicable requirements, the project would be consistent to the maximum extent practicable with the tidal and non-tidal wetlands enforceable policy and point source water pollution enforceable policy of the Virginia CZM Program.

6. Point Source Air Pollution. The FCD (page 9) states that fuel-burning equipment for construction of the breakwaters and movement of sand would generate emissions. However, project activities would not violate federal or state air quality standards.

6(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, environmental impact reviews (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 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*.

6(b) Requirements. The following requirements may be applicable to the proposed project.

6(b)(i) Fugitive Dust. During land-disturbing activities, fugitive dust must be kept to a minimum by using control methods outlined in 9VAC5-50-60 *et seq.* of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or suitable chemicals for dust control during the proposed demolition and construction operations and from material stockpiles;
- Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

6(b)(ii) Fuel-Burning Equipment. Fuel-burning equipment (generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements.

6(c) Conclusion. Provided the project complies with applicable requirements, it would be consistent to the maximum extent practicable with the point source air pollution enforceable policy.

7. Chesapeake Bay Preservation Areas. The FCD (page 7) states that Wallop's Island is specifically excluded from the locality's Chesapeake Bay Preservation Act overlay area.

7(a) Agency Jurisdiction. The DEQ Office of Watershed and Local Government Assistance administers the Chesapeake Bay Preservation Act (Virginia Code §62.1-44.15:67 *et seq*.) and Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830-10 *et seq*.). Each Tidewater locality must adopt a program based on the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations. The Act and regulations recognize local government responsibility for land use decisions and are designed to establish a framework for compliance without dictating precisely what local programs must look like. Local governments have flexibility to develop water quality preservation programs that reflect unique local characteristics and embody other community goals. Such flexibility also facilitates innovative and creative approaches in achieving program objectives. The regulations address nonpoint source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The regulations use a resource-based approach that recognizes differences between various land forms and treats them differently.

7(b) Agency Findings. The DEQ Office of Watersheds and Local Government Assistance (OWLGA) states that Wallops Island is not subject to the Chesapeake Bay Preservation Act.

7(c) Conclusion. As proposed, the project is consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy.

8. Erosion and Sediment Control and Stormwater Management. The FCD (pages 9-10) states that the proposed action has the potential to increase nonpoint source runoff to the Atlantic Ocean. However, construction would implement best management practices for vehicle and equipment fueling and maintenance as well as site-specific spill prevention and control measures.

8(a) Agency Jurisdiction. The DEQ Office of Stormwater Management (OSM) administers the following laws and regulations governing construction activities:

- Virginia Erosion and Sediment Control Law (VESCL) (§ 62.1-44.15:51 *et seq.*);

- Virginia Stormwater Management Act (VSMA) (§ 62.1-44.15:24 *et seq.*);
- Virginia Erosion and Stormwater Management Regulation (9VAC25-875 *et. seq.*) and
- General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (9VAC25-875 *et. seq.*).

In addition, DEQ is responsible for VSMP General Permit for Stormwater Discharges from Construction Activities related to Municipal Separate Storm Sewer Systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (9VAC25-890-40).

8(b) Requirements.

8(b)(i) Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R) and Virginia Stormwater Management Law and Regulations (VSWML&R), including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,00 square feet would be regulated by Virginia Erosion and Stormwater Management Regulation.

Accordingly, the applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet would be regulated by the Virginia Erosion and Stormwater Management Regulation and associated laws. Accordingly, the applicant must prepare and implement a stormwater management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan should be submitted to the DEQ regional office that serves the area where the project is located for review and compliance. The applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy (Reference: VESCL 62.1-44.15 *et seq*.).

8(b)(ii) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations (Reference: Virginia Stormwater Management Act 62.1-44.15 *et seq*.; Consolidated ESC/SWM Regulations 9VAC25-880 *et seq.*).

8(c) Conclusion. Assuming adherence to the applicable above-reference requirements, the project would be consistent to the maximum extent practicable with the nonpoint source pollution control management enforceable policy.

9. Solid and Hazardous Waste Management. The draft EA (page 3-2) states that the 2010 Final Shoreline Restoration and Infrastructure Programmatic Environmental Impact Statement addressed hazardous materials and waste, so the draft EA does not contain an analysis.

9(a) Agency Jurisdiction. On behalf of the Virginia Waste Management Board, the DEQ Division of Land Protection and Revitalization is responsible for carrying out the mandates of the Virginia Waste Management Act (Virginia Code §10.1-1400 *et seq*.), as well as meeting Virginia's federal obligations under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation Liability Act (CERCLA), commonly known as Superfund. The DEQ Division of Land Protection and Revitalization also administers those laws and regulations on behalf of the State Water Control Board that govern Petroleum Storage Tanks (Virginia Code §62.1-44.34:8 *et seq*.), including Aboveground Storage Tanks (9VAC25-91 *et seq*.) and Underground Storage Tanks (9VAC25-580 *et seq*. and 9VAC25-580-370 *et seq*.), also known as Virginia Tank Regulations, and § 62.1-44.34:14 *et seq*. which covers oil spills.
Virginia:

- Virginia Waste Management Act, Virginia Code § 10.1-1400 *et seq*.
- Virginia Solid Waste Management Regulations, 9VAC20-81
    - (9VAC20-81-620 applies to asbestos-containing materials)
- Virginia Hazardous Waste Management Regulations, 9VAC20-60
    - (9VAC20-60-261 applies to lead-based paints)
- Virginia Regulations for the Transportation of Hazardous Materials, 9VAC20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq*.
- U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107
- Applicable rules contained in Title 40, Code of Federal Regulations.

9(b) Database Search. The DEQ Division of Land Protection and Revitalization (DLPR) conducted a search (200-foot radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area.

DLPR identified one CERCLA site within the project area which might impact the project:

- EPA ID VA8800010763, NASA Wallops Flight Facility, 32400 Fulton Street, Wallops Island, VA 23337, Not on the NPL

9(c) Agency Recommendations. DEQ encourages all projects to implement pollution prevention principles, including:

- the reduction, reuse and recycling of all solid wastes generated; and
- the minimization and proper handling of generated hazardous wastes.

9(d) Requirements.

- The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the project manager would follow applicable federal, state, and local regulations for their disposal.
- The removal, relocation or closure or installation/operation of any regulated petroleum storage tanks, aboveground storage tank (AST) or underground storage tank (UST), must be conducted in accordance with the requirements of the Virginia Tank Regulations 9 VAC 25-91-10 *et seq.* (AST) and / or 9 VAC 25-580-10 *et seq*. (UST). Submit appropriate documentation to DEQ.
- Test and dispose of any soil/sediment that is suspected of contamination or wastes that are generated during construction-related activities in accordance with applicable federal, state, and local laws and regulations.
- Any future site activities involving excavation or disturbance of formerly petroleum contaminated soils and/or groundwater must be reported to DEQ, as authorized by Virginia Code § 62.1-44.34.8 through 9 and 9 VAC 25-580-10 *et seq*.
- Petroleum-contaminated soils and ground water generated during implementation of this project must be properly characterized and disposed of properly.

- 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.
- If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by Code of Virginia 62.1-44.34.8 through 19 and 9VAC 25-580-10 *et seq*.
- All structures being demolished or removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM and LBP are found, in addition to the federal waste-related regulations mentioned above, state regulations 9VAC20-81-640 for ACM and 9VAC20-60-261 for LBP must be followed.

10. Natural Heritage Resources. The EA (pages 3-20 to 3-40) evaluates impacts to bottom dwelling invertebrates, wildlife, fisheries and habitat, marine mammals, and special status species.

10(a) Agency Jurisdiction.

10(a)(i) Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH): 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), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and the 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).

10(a)(ii) Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

10(b) Agency Findings – Natural Heritage. According to the information in DCR's files, the Wallops - Assawoman Islands Conservation Site is located within the project area.

Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation

sites are given a biodiversity significance ranking (B-rank) based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant.

The Wallops - Assawoman Islands Conservation Site has been assigned a B-rank of B1, which represents a site of outstanding significance. The natural heritage resources associated with this site are:

- *Ammospiza caudacuta* Saltmarsh Sparrow G2/S2B,S3N/SOC/NL
- *Caretta caretta* Loggerhead (Sea Turtle) G2G4/S1B,S1N/LT/LT
- *Charadrius melodus* Piping Plover G3/S2B,S1N/LT/LT
- *Charadrius wilsonia* Wilson's Plover G5/S1B/NL/LE
- *Circus hudsonius* Northern Harrier G5/S1S2B,S3N/NL/NL
- *Eupatorium maritimum* Seaside Thoroughwort G2?/S1/SOC/NL
- *Euphorbia bombensis* Southern seaside spurge G4G5/S2/NL/NL
- *Falco peregrinus* Peregrine Falcon G4/S1B,S2N/NL/LT
- *Juncus megacephalus* Big-headed rush G4G5/S2/NL/NL
- *Papaipema araliae* Aralia Shoot Borer Moth G3G4/S2S3/NL/NL
- *Papaipema duovata* Seaside Goldenrod Stem Borer G2G3/S2S3/SOC/NL
- *Rynchops niger* Black Skimmer G5/S2B,S1N/NL/NL
- *Sternula antillarum* Least Tern G4/S2B/NL/NL
- Black Cherry Xeric Dune Woodland G1G2/S1/NL/NL
- Interdune Swale (Northern Mixed Grassland Type) G1G2/S1?/NL/NL
- Interdune Swale / Pond G2/S2/NL/NL
- Low Salt Marsh (Salt Panne Type) GNR/S3?/NL/NL
- Wax Myrtle Interdune Shrubland G3G4/S2S3/NL/NL
- Xeric Backdune Grassland G2/S2/NL/NL
- Bird Nesting Colony G5/SNR/NL/NL

DCR supports the planned mitigation measures to reduce the probability and intensity of potential effects to protected species.

DCR also supports the VMRC permit terms to reduce the effects on special status species that were issued during the 2021 permit and consultation modifications to revise breakwater construction from in-water barge to temporary bulkheads.

DCR requests the opportunity to review specific reasonably foreseeable future actions and mitigation measures for this project as they are developed.

In addition, according to DCR's predicted suitable habitat modeling and review by a DCR biologist, there is a potential for sea-beach amaranth (*Amaranthus pumilus*, G2/S1/LT/LT) to occur in the project area if suitable habitat exists on site.

10(c) Agency Findings – Threatened and Endangered Plant and Insect Species. 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. See the attached tables from DCR for additional information.

10(d) Agency Findings – State Natural Area Preserves. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

10(e) Agency Recommendations.

- Due to the legal status of some of the identified natural heritage resources, DCR recommends continued coordination with the U.S Fish and Wildlife Service and NOAA Fisheries to ensure compliance with protected species legislation.

- Coordinate with DCR if any occurrences of sea-beach amaranth are documented.

- Contact the DCR DNH and resubmit project information and a map if the scope of the project changes and/or six months have passed before it is utilized.

11. Floodplain Management. The draft EA (page 3-2) states that the 2010 Final Shoreline Restoration and Infrastructure Programmatic Environmental Impact Statement addressed floodplains, so the draft EA does not contain a detailed analysis.

11(a) Agency Jurisdiction. DCR is the lead coordinating agency for the Commonwealth's floodplain management program and the National Flood Insurance Program (Code of Virginia § 10.1-602).

11(b) Agency Findings. DCR states that the National Flood Insurance Program (NFIP) is administered by Federal Emergency Management Agency (FEMA) and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

The DCR Floodplain Management Program does not have regulatory authority for projects in the Special Flood Hazard Area (SFHA). For federal projects, the applicant/developer is encouraged to contact the local floodplain administrator and comply with the community's local floodplain ordinance.

11(c) Requirements. DCR's comments indicate that the following may be applicable:

- All development within a SFHA, as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.
- Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

12. Public Drinking Water Sources. The draft EA (page 3-2) states that the 2010 Final Shoreline Restoration and Infrastructure Programmatic Environmental Impact Statement addressed utilities, so the draft EA does not contain a detailed analysis.

12(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water reviews projects for the potential to impact drinking water sources (groundwater wells, springs, and surface water intakes) serving waterworks. VDH administers the Virginia Waterworks Regulations (12VAC5-590) governing waterworks operation and construction, and has primacy for the National Primary Drinking Water Regulations (40 CFR § 141) and implements the National Secondary Drinking Water Regulations (40 CFR § 143).

12(b) Agency Findings. VDH ODW provides comments as they relate to proximity to public drinking water sources (groundwater wells, springs and surface water intakes). There are no apparent impacts to public drinking water sources due to this project.

13. Pollution Prevention. DEQ's Office of Pollution of Prevention hosts a number of programs and initiatives that serve for non-regulatory assistance to businesses, institutions, and communities including the Virginia Environmental Excellence Program and Virginia Green.

DEQ's Office of Pollution Prevention provides information and technical assistance relating to pollution prevention techniques and EMS. If interested, please contact DEQ (Meghann Quinn at Meghann.Quinn@deq.virginia.gov or 804-774-9076).

14. Pesticides and Herbicides. In general, when pesticides or herbicides must be used, their use should be strictly in accordance with manufacturers' recommendations. In addition, DEQ recommends that the responsible agent use the least toxic pesticides or herbicides effective in controlling the target species. For more information on pesticide or herbicide use, please contact the Virginia Department of Agriculture and Consumer Services (804- 371-6560).

15. Historic and Archaeological Resources. The EA (page 3-41) states that previous surveys did not identify any archaeological resources in the area of potential effect. Inadvertent discovery of unidentified archaeological resources would result in immediate cessation of work and notification to the Wallops cultural resources manager.

15(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. For state projects or activities on state lands, DHR is afforded an opportunity to review and comment on (1) the demolition of state property; (2) major state projects requiring an EIR; (3) archaeological investigations on state-controlled land; (4) projects that involve a landmark listed in the Virginia Landmarks Register; (5) the sale or lease of surplus state property; (6) exploration and recovery of underwater historic properties; and (7) excavation or removal of archaeological or historic features from caves. Please see DHR's website for more information about applicable state and federal laws and how to submit an application for review: https://www.dhr.virginia.gov/programs/federal-state-review/.

15(b) Agency Findings. DHR has been in direct consultation with NASA and reached consensus that the proposed project will not affect historic properties.

REGULATORY AND COORDINATION NEEDS

1. Wildlife and Inland Fisheries. Coordinate with DWR (Hannah Schul at Hannah.Schul@dwr.virginia.gov) regarding its recommendations and conditions for concurrence, as necessary.

2. Subaqueous Lands, Dunes and Beaches. Coordinate with VMRC (Claire Gorman at Claire.Gorman@mrc.virignia.gov or 757-247-2285) on requirements related to subaqueous lands and dune and beach permits. Coordinate with VIMS (Emily Hein at eahein@vims.edu) regarding its comments and recommendations, as necessary.

3. Water Quality and Wetlands. If activities are proposed to occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant should contact the DEQ TRO VWP Permit Program (Jeff Hannah at 757-407-2510) to determine the need for any permits prior to commencing work that could impact surface waters or wetlands.

4. Air Quality Regulations. The following regulations may apply during construction or operation:

- fugitive dust and emissions control (9VAC5-50-60 *et seq.*)
- permits for fuel-burning equipment (9VAC5-80-110 *et seq*.)

Contact DEQ TRO (Mariama Ouedraogo at 757-407-2855 or wendbebe.savadogo@deq.virginia.gov) if the use of fuel-burning equipment is proposed

5. Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with Virginia Erosion and Stormwater Management Regulation, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Submit the ESC and SWM plans to DEQ TRO (Reference: Virginia Erosion and Stormwater Management Regulation, 9VAC25-875 *et. seq.*). Coordinate with DEQ TRO (Courtney Smith at 757-493-1072 or Courtney.Smith@deq.virginia.gov), as necessary.

6. General Permit for Stormwater Discharges from Construction Activities (VAR10). The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). Coordinate with DEQ TRO (Courtney Smith at 757-493-1072 or Courtney.Smith@deq.virginia.gov), as necessary.

7. Solid Waste and Hazardous Substances. All solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. If free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ TRO (Melinda Woodruff at melinda.woodruff@deq.virginia.gov). Any future site activities involving excavation or disturbance of formerly petroleum contaminated soils and/or groundwater must be reported to DEQ, as authorized by Code of Virginia 62.1-44.34.8 through 19 and 9VAC25-580-10 *et seq*.

8. Natural Heritage Resources. Contact the DCR DNH (804-371-2708) about its recommendations and to re-submit project information and a map for an update on natural heritage information if the scope of the project changes and/or six months have passed before it is utilized. Due to the legal status of some of the identified natural heritage resources, DCR recommends continued coordination with the U.S Fish and Wildlife Service and NOAA Fisheries to ensure compliance with protected species legislation.

9. Floodplain. As applicable, the federal agency should ensure compliance with applicable floodplain requirements. To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory.

Thank you for the opportunity to comment on this EA and FCD. The detailed comments of reviewers are attached. If you have questions, please feel free to contact me or Julia Wellman at 804-774-8237.

Sincerely,

Bettina Rayfield, Manager
Office of Environmental Impact Review and Renewable Energy Programs
Virginia Department of Environmental Quality
804-659-1915
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ec: Nicole Stawderman, DWR
Keith Tignor, VDACS
Allison Tillett, DCR
Arlene Warren, VDH
Samantha Henderson, DHR
Claire Gorman, VMRC
Emily Hein, VIMS
Michael Mason, Accomack County
Elaine Meil, Accomack-Northampton PDC
Shari Miller, NASA

Outlook

ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

From Doucette, Tamara (DWR) <Tamara.Doucette@dwr.virginia.gov>
Date Thu 2/26/2026 10:41 AM
To Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Cc Boettcher, Ruth (DWR) <Ruth.Boettcher@dwr.virginia.gov>

Julia,

We have reviewed the draft NASA Wallops Flight Facility Shoreline Protection Program EA. This tiered EA covers the following proposed actions to be undertaken on Wallops Island: beach renourishment with sand dredged from Unnamed Shoal A; the construction of up to 12 new parallel breakwaters approximately 200 feet offshore from the renourishment area; and the repair and extension of the existing seawall by an additional 3,170 ft. The next cycle of beach stabilization activities is expected to begin sometime in 2027 and at a minimum will likely include beach renourishment and the construction of two new sets of breakwaters somewhere between the two existing breakwaters.

Shoreline Stabilization Design Models
In early 2024, DWR entered into a 5-year contractual agreement with NASA to conduct ecological and geophysical shoreline studies for the specific purpose of informing future shoreline stabilization project designs. To date, the following four reports containing data collected by the geophysical team have been published:

- Bemelmans, C.B., Stalk, C.A., Ciarletta, D.J., and Miselis, J.L. (2025). Coastal multibeam bathymetry and backscatter data collected in June 2024 from Wallops and Assawoman Islands, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P14SGUMT.
- Forde, A.S., Stalk, C.A., Ciarletta, D.J., and Miselis, J.L. (2025). Chirp sub-bottom profile geophysical data collected in 2024 from Wallops Island and Assawoman Island, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P1NZ6CC2.
- Kivimaki, K.E., Hein, E.A., and Hein, C.J., (2025). Dataset: Shorelines of Wallops and Assawoman Islands, Virginia, 2016-2025: William & Mary, data release, https://doi.org/10.25773/5ys8-cs64.
- Lyons, E.O., Bernier, J.C., Nick, S.K., Ciarletta, D.J., and Miselis, J.L. (2025). Coastal single-beam bathymetry and beach elevation data collected in 2024 from Wallops and Assawoman Islands, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P1HFYGE6.

Due to the immediacy of the upcoming project cycle, none of the newly published data was incorporated in the 2027 project design. Instead, NASA continued to rely solely on traditional models developed by the US Army Corps of Engineers. DWR strongly encourages NASA to begin engaging with both the geophysical and ecological teams immediately through a structure decision making process or similar approach to (1) establish robust channels of communication and information exchange between the shoreline studies teams and NASA project designers and (2) ensure that alternative project designs are developed and considered in forthcoming stabilization efforts covered under this EA and future assessments.

Extension of Existing Seawall

One of the proposed actions covered in this EA is the extension of the existing 15,900 long rock seawall by another 3,170 ft. This will increase the length of beach that will undergo severe erosion, require additional breakwaters to slow down the loss of sand, and increase the amount of shoreline in need of renourishment. It is also not clear how the seawall extension will affect Assawoman Island, which is attached to Wallops, or any of the other islands to the south. The VDWR recommends delaying this action until the ecological and geophysical shoreline studies are complete and the information gathered can be incorporated into the seawall extension decision making process.

Biological Monitoring of Offshore Project Activities

Renourishment activities will entail dredging sand from Unnamed Shoal A, which is an unvegetated, offshore sand ridge located roughly 7 miles east of Assateague Island and approximately 1,800 acres in size. If dredging occurs when water temperatures are above 50°F (10°C), there is chance sea turtles will be in the area. In lieu of having protected species observers onboard during dredging operations, NASA assumes a total take of 2.165 federally and state threatened Loggerhead sea turtles and 0.24 federally and state endangered Kemps Ridley sea turtles. **DWR strongly recommends consultation with NOAA Fisheries on the verification of this calculation to ensure take is appropriately addressed.**

The presence of onboard protected species observers (PSO) is one of several reasonable and prudent measures in the most recent National Marine Fisheries Service Biological Opinion (NMFS 2018). On hopper dredges outfitted with munitions and explosives of concern, the PSO primary responsibility is to look for impinged sea turtle carcasses/parts on the draghead every time it is removed from the water. Additionally, PSO can also look for live sea turtles in the area while the dredge is operating and alert the operator if any are detected. It is not clear in the EA if PSO will be onboard during the upcoming dredging cycle. **DWR strongly recommends the presence of onboard PSO during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.**

The EA states a “bridge lookout” would be onboard the hopper dredge to look for federally listed whale species. It is not clear whether this individual will be a trained PSO or a member of the dredge crew. When a listed whale is spotted within 1 km (0.62 mile) of the dredge, dredging operations will cease until the whale is farther than 1 km from the dredge. Should an individual be detected within 1.60 km (1 mile) of the vessel, the vessel will be required to reduce speed to below 14 knots. Lastly, the vessel must maintain a minimum 500-foot buffer to any North Atlantic right whales. **DWR recommends that the “bridge lookout” is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 km, irrespective of species, and vessel speed is dropped to below 14 knots.**

Biological Monitoring of Onshore Project Activities

Should renourishment activities be scheduled between March 15 and August 31, NASA will ensure that a qualified biological monitor conducts daily surveys of the project site and adjacent areas to detect nesting piping plovers and sea turtles, in accordance with Wallops Flight Facility’s Protected Species Monitoring Plan. If piping plover or sea turtle nests are identified, the nests will be clearly marked using exclosures or signage and rope barriers encircling each site. A qualified biological monitor would conduct daily nest inspections. All on-site personnel would be informed of the nesting status, and all project activities within 1,000 feet of a nest would be suspended or relocated until hatching is complete. **DWR recommends the following modifications and additions to these protocols to avoid significant adverse impacts upon listed/designated SGCN species resulting from the proposed activities:**

1. **All federally and state threatened piping plover, state endangered Wilson’s plover, Tier IIa American oystercatcher nests (hereafter collectively referred to as shorebird nests) and sea turtle nests should be clearly marked with a 25 ft. diameter rope barrier encircling each nest.**

2. **Seabird colonies should be clearly marked with signage and/or rope barriers.**
3. **Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.**
4. **All project activities within 1,000 ft of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory.**
5. **When shorebird and seabird nests hatch, the biological monitor will be responsible for locating broods and reporting their locations to all on-site personnel daily.**
6. **All project activities within 1,500 feet of a shorebird or seabird brood should be suspended or relocated until the chicks have fledged or died *and* the adults have abandoned the territory.**
7. **Project activities should *not* be allowed to resume when a brood moves beyond the 1,500 ft buffer on any given day.**
8. **If a sea turtle crawl is detected, the biological monitor should notify the VDWR immediately and take close-up photos of the crawl and all areas where the turtle appeared to dig. The VDWR will send staff to confirm the presence of eggs based on the photos received from the biological monitor. If eggs are found, the VDWR will provide on-site instructions on nest and hatchling management.**

Assuming adherence to our recommendations for the protection of listed species and/or designated resources under our jurisdiction, as depicted in **bolded font** above, and assuming strict adherence to best management practices for erosion and sediment control is maintained, we find this project to be consistent with the Wildlife and Inland Fisheries and Commonwealth Lands Enforceable Policies of the Coastal Zone Management Program.

If the applicant does not adhere to the above-referenced condition, then the project would be inconsistent with the wildlife and inland fisheries enforceable policy for the following reason:

- The proposed activities, if occurring without the above bolded conservation measures, may adversely impact shorebirds, seabirds, marine mammals, and sea turtles, which are protected species in the Commonwealth of Virginia.

Thank you,

Tamara

Tamara Doucette
Environmental Services Biologist
P **804.367.8364**
Virginia Department of Wildlife Resources
CONSERVE. CONNECT. PROTECT.
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Outlook

RE: [EXTERNAL] Re: Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

From Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Date Thu 3/26/2026 2:09 PM
To Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Thanks, Julia. NASA agrees with that addition.

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center
o: 757.864.5662
shari.a.miller@nasa.gov

From: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Sent: Thursday, March 26, 2026 2:00 PM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Subject: Re: [EXTERNAL] Re: Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Hi Shari,

Regarding the fourth condition, "of any year" has been added; see red/bold font below.

"Should renourishment activities be scheduled between March 15 and August 31 **of any year**, adhere to the following modifications and additions to protocols in Wallops Flight Facility's Protected Species Monitoring Plan to avoid significant adverse impacts upon listed/designated Species of Greatest Conservation Need (SGCN) resulting from the proposed activities:"

While implied, we added it for clarity.

If you have any concerns, please email me today.

Thanks.

Julia Wellman
Environmental Impact Review Coordinator
Office of Environmental Impact Review
Division of Environmental Enhancement
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219
804-774-8237

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From: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Sent: Wednesday, March 25, 2026 2:17 PM
To: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Cc: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Deyo, Brendan G. (GSFC-LD020) <brendan.g.deyo@nasa.gov>
Subject: RE: [EXTERNAL] Re: Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Hi, Julia,

This looks accurate to me. NASA agrees to abide by these conditions.

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center
o: 757.864.5662
shari.a.miller@nasa.gov

From: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Sent: Wednesday, March 25, 2026 1:33 PM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Subject: [EXTERNAL] Re: Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Hi Shari,

Thank you for the additional clarification and modifications. DWR is in agreement with the NASA's modifications to the new brood location condition (see below) and appreciates NASA's clarification.

Based on our coordination, I believe that the following is the final list of DWR's conditions:

1. Consult with NOAA Fisheries on the verification of the sea-turtle take calculation to ensure take is appropriately addressed.
2. Ensure the presence of onboard protected species observers (PSO) during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.
3. Ensure that the “bridge lookout” is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 kilometer, irrespective of species, and vessel speed is dropped to below 14 knots.
4. Should renourishment activities be scheduled between March 15 and August 31, adhere to the following modifications and additions to protocols in Wallops Flight Facility’s Protected Species Monitoring Plan to avoid significant adverse impacts upon listed/designated Species of Greatest Conservation Need (SGCN) resulting from the proposed activities:
    1. Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.
    2. All project activities within 1,000 ft of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory**.**
    3. If a sea turtle crawl is detected, the biological monitor should notify the Virginia Department of Wildlife Resources (DWR) immediately and take close-up photographs of the crawl and all areas where the turtle appeared to dig. Allow DWR to confirm the presence of eggs based on the photographs received from the biological monitor. If eggs are found, allow DWR to provide on-site instructions on nest and hatchling management.
    4. NASA will monitor Wallops Island beach twice a day during active construction events, once in the morning for nest and brood status and again in the afternoon, to the maximum extent practicable (barring bad weather events, launch hazards, etc.). Afternoon monitoring will focus on adjusting the barrier locations, if needed, based upon nest (or renest) and brood locations.

Does the list look accurate to you? Given the degree of coordination, I just want to double check that we are on the same page.

If you could get back to me by tomorrow morning, I would appreciate it. We're hoping to finish this one this week.

Thank you, Julia

Julia Wellman
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From: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Sent: Thursday, March 19, 2026 4:53 PM

To: Wellman, Julia (DEQ) <julia.wellman@deq.virginia.gov>; Boettcher, Ruth (DWR) <ruth.boettcher@dwr.virginia.gov>
Cc: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Deyo, Brendan G. (GSFC-LD020) <brendan.g.deyo@nasa.gov>
Subject: FW: Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Good afternoon, Julia and Ruth,

Thank you to DWR for agreeing to remove conditions 4a and 4b.

Let me try to clarify NASA's proposed mitigation plan for conditions 4e, 4f, and 4g.

NASA proposes to clearly delineate a boundary extending from the eastern toe of the rock seawall, 1,000 feet south of the southernmost (on the north end) and 1,000 feet north of the northernmost piping plover nests (on the south end) using staked rope or similar markers, such that no buffer area extends across or westward of the seawall (see figure attached). NASA agrees to move the delineated boundary accordingly each time a new Piping Plover (PIPL), Wilson's Plover (WIPL) or American Oystercatcher (AMOY) nest, irrespective of species, is laid within the project area and south of the previous southernmost PIPL, WIPL or AMOY nest (on the north end of Wallops Island) or north of the previous northernmost PIPL, WIPL or AMOY nest (on the south end of Wallops Island). For example, if a new PIPL nest (or renest) is laid within in the project area 100 feet south of the existing southernmost nest (on the north end of the island), regardless of whether the existing nest is a PIPL, WIPL or AMOY nest, the new delineated boundary, using staked rope or similar markers, will be placed 1,000 feet south of the new nest (or renest). With regard to least tern (LETE) nests, NASA will provide a minimum 100-foot buffer (Smith, Gallagher, & Danner 2025) north and south of the entire colony even if only a portion of the colony is in the project area. When LETE nests are within PIPL, WIPL or AMOY protected buffers, then a 1,000-foot buffer to the north or south of the northernmost or southernmost nest, irrespective of species, applies.

> Alexander O Smith, Erin E Gallagher, Raymond M Danner, Breeding *Sternula antillarum* (Least Terns) disturbance distances and duration of escape behaviors: Pedestrians necessitate larger conservation buffers than do passing vehicles, *Ornithological Applications*, Volume 127, Issue 3, 5 August 2025, duaf026, https://doi.org/10.1093/ornithapp/duaf026. Access 18 Mar. 2026."

NASA agrees to the condition to monitor Wallops Island beach twice a day during active construction events, once in the morning for nest and brood status and again in the afternoon, to the maximum extent practicable (barring bad weather events, launch hazards, etc.). Afternoon monitoring will focus on adjusting the barrier locations, if needed, based upon nest (or renest) and brood locations.

I hope that helps. Please let me know if this plan is still not clear.

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center
o: 757.864.5662
shari.a.miller@nasa.gov

From: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Sent: Tuesday, March 17, 2026 2:49 PM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Boettcher, Ruth (DWR) <Ruth.Boettcher@dwr.virginia.gov>
Subject: Re: [EXTERNAL] Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Hi Shari,

Thank you for the response.

DWR agrees to remove conditions 4a and 4b.

DWR would like NASA to clarify that delineating a boundary, as originally described by NASA in the March 11, 2026 email below, includes the following details:

> NASA agrees to move the delineated boundary accordingly each time a new Piping Plover (PIPL), Wilson's Plover (WIPL) or American Oystercatcher (AMOY) nest, irrespective of species, is laid within the project area and south of the previous southernmost PIPL, WIPL or AMOY nest or north of the previous northernmost PIPL, WIPL or AMOY nest. For example, if a new PIPL nest (or renest) is laid within in the project area 100 feet south of the existing southernmost nest, regardless of whether the existing nest is a PIPL, WIPL or AMOY nest, the new delineated boundary, using staked rope or similar markers, will be placed 1,000 feet south of the new nest (or renest). With regard to least tern (LETE) nests, NASA will provide a 1,000-foot buffer north and south of the entire colony even if only a portion of the colony is in the project area. When LETE nests are within PIPL, WIPL or AMOY protected buffers, then a 1,000-foot buffer to the north or south of the northernmost or southernmost nest, irrespective of species, applies.

Question 1: Is the above-referenced explanation NASA's interpretation as well? DWR thinks that DWR/NASA are on the same page but would prefer clarification.

DWR will remove conditions 4e, 4f, and 4g if NASA accepts the following new condition: All brood locations will be monitored a minimum of two times per day: in the morning before construction work begins in the project area and in the afternoon between 1 p.m. and 3 p.m.

Question 2: Does NASA accept the new condition?

If you could respond by March 20, I would appreciate it.

Regards, Julia

Julia Wellman
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Richmond, Virginia 23219
804-774-8237

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From: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Sent: Wednesday, March 11, 2026 12:38 PM
To: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Cc: Doucette, Tamara (DWR) <Tamara.Doucette@dwr.virginia.gov>; Boettcher, Ruth (DWR) <Ruth.Boettcher@dwr.virginia.gov>; Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Deyo, Brendan G. (GSFC-LD020) <brendan.g.deyo@nasa.gov>
Subject: RE: [EXTERNAL] Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Hi, Julia,

My apologies for the delay in responding. NASA is willing to adhere to all conditions stated with the exception of 4a, 4b, 4e, 4f, and 4g, which are addressed below.

Regarding conditions 4a and 4b, NASA already employs protective exclosures around each piping plover nest site in accordance with its Biological Opinion (BO) from the U.S. Fish and Wildlife Service (USFWS). To further supplement these protections, NASA proposes to clearly delineate a boundary extending 1,000 feet south of the southernmost and 1,000 feet north of the northernmost piping plover nests using staked rope or similar markers. Any American oystercatcher or least tern nest located outside that boundary but within the project area will likewise be delineated with rope or other visible marking to identify restricted areas for project personnel until the chicks hatch. The attached map identifies the full project area and documents all known nesting locations of piping plovers, American oystercatchers, and least terns (i.e., seabird colonies) recorded during the 2025 nesting season. It is also worth noting that historical data consistently shows the number of nest sites falling within the project area to be low.

Regarding conditions 4e, 4f, and 4g, NASA respectfully disagrees with the proposed requirement to maintain a moving 1,500-foot buffer around each nesting brood, as doing so is not operationally feasible. In lieu of this requirement, NASA proposes maintaining a fixed 1,000-foot perimeter around the nest areas, supplemented by the visible markings described above. NASA believes this approach provides equivalent protection for state-listed species while remaining operationally practicable.

The Department of Wildlife Resources (DWR) has requested a conditional concurrence under the federal consistency regulations for the above-referenced project based on the following conditions:

1. Consult with NOAA Fisheries on the verification of the sea-turtle take calculation to ensure take is appropriately addressed.
2. Ensure the presence of onboard protected species observers (PSO) during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.
3. Ensure that the “bridge lookout” is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 kilometer, irrespective of species, and vessel speed is dropped to below 14 knots.
4. Should renourishment activities be scheduled between March 15 and August 31, adhere to the following modifications and additions to protocols in Wallops Flight Facility’s Protected Species Monitoring Plan to avoid significant adverse impacts upon listed/designated Species of Greatest Conservation Need (SGCN) resulting from the proposed activities:

    a. All federally and state threatened piping plover, state endangered Wilson’s plover, Tier IIa American oystercatcher nests (hereafter collectively referred to as shorebird nests) and sea turtle nests should be clearly marked with a 25 ft. diameter rope barrier encircling each nest.

    b. Seabird colonies should be clearly marked with signage and/or rope barriers.

    c. Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.

    d. All project activities within 1,000 ft of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory.

    e. When shorebird and seabird nests hatch, the biological monitor will be responsible for locating broods and reporting their locations to all on-site personnel daily.

    f. All project activities within 1,500 feet of a shorebird or seabird brood should be suspended or relocated until the chicks have fledged or died *and* the adults have abandoned the territory.

g. Project activities should *not* be allowed to resume when a brood moves beyond the 1,500 ft buffer on any given day.

h. If a sea turtle crawl is detected, the biological monitor should notify the Virginia Department of Wildlife Resources (DWR) immediately and take close-up photographs of the crawl and all areas where the turtle appeared to dig. Allow DWR to confirm the presence of eggs based on the photographs received from the biological monitor. If eggs are found, allow DWR to provide on-site instructions on nest and hatchling management.

Shari Miller

Environmental Planning Group Lead

Medical and Environmental Management Division

Goddard Space Flight Center

o: 757.864.5662

shari.a.miller@nasa.gov

From: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Sent: Tuesday, March 3, 2026 9:50 AM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Doucette, Tamara (DWR) <Tamara.Doucette@dwr.virginia.gov>; Boettcher, Ruth (DWR) <Ruth.Boettcher@dwr.virginia.gov>
Subject: [EXTERNAL] Requesting response: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Hi Shari,

The Department of Wildlife Resources (DWR) has requested a conditional concurrence under the federal consistency regulations for the above-referenced project based on the following conditions:

1. Consult with NOAA Fisheries on the verification of the sea-turtle take calculation to ensure take is appropriately addressed.

2. Ensure the presence of onboard protected species observers (PSO) during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.

3. Ensure that the “bridge lookout” is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 kilometer, irrespective of species, and vessel speed is dropped to below 14 knots.

4. Should renourishment activities be scheduled between March 15 and August 31, adhere to the following modifications and additions to protocols in Wallops Flight Facility’s Protected Species Monitoring Plan to avoid significant adverse impacts upon listed/designated Species of Greatest Conservation Need (SGCN) resulting from the proposed activities:

    - All federally and state threatened piping plover, state endangered Wilson’s plover, Tier IIa American oystercatcher nests (hereafter collectively referred to as shorebird nests) and sea turtle nests should be clearly marked with a 25 ft. diameter rope barrier encircling each nest.
    - Seabird colonies should be clearly marked with signage and/or rope barriers.
    - Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.
    - All project activities within 1,000 ft of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory**.**
    - When shorebird and seabird nests hatch, the biological monitor will be responsible for locating broods and reporting their locations to all on-site personnel daily.
    - All project activities within 1,500 feet of a shorebird or seabird brood should be suspended or relocated until the chicks have fledged or died *and* the adults have abandoned the territory.
    - Project activities should *not* be allowed to resume when a brood moves beyond the 1,500 ft buffer on any given day.
    - If a sea turtle crawl is detected, the biological monitor should notify the Virginia Department of Wildlife Resources (DWR) immediately and take close-up photographs of the crawl and all areas where the turtle appeared to dig. Allow DWR to confirm the

presence of eggs based on the photographs received from the biological monitor. If eggs are found, allow DWR to provide on-site instructions on nest and hatchling management.

Is NASA willing to adhere to these conditions when implementing the Shoreline Protection Program?

If you could respond by March 10, I would appreciate it. In the meantime, please feel free to reach out with any questions about these conditions or the conditional concurrence. If you have questions about the conditions, please include Tamara and Ruth, copied, from DWR in your response.

Regards, Julia

Julia Wellman
Environmental Impact Review Coordinator
Office of Environmental Impact Review
Division of Environmental Enhancement
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219
804-774-8237

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From: Doucette, Tamara (DWR) <Tamara.Doucette@dwr.virginia.gov>
Sent: Thursday, February 26, 2026 10:40 AM
To: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Cc: Boettcher, Ruth (DWR) <Ruth.Boettcher@dwr.virginia.gov>
Subject: ESSLog 39481_26-015F_Draft EA/FCD NASA Wallops Flight Facility Shoreline Protection Program Accomack County_DWR_TMD20260226

Julia,

We have reviewed the draft NASA Wallops Flight Facility Shoreline Protection Program EA. This tiered EA covers the following proposed actions to be undertaken on Wallops Island: beach renourishment with sand dredged from Unnamed Shoal A; the construction of up to 12 new parallel breakwaters approximately 200 feet offshore from the renourishment area; and the repair and extension of the existing seawall by an additional 3,170 ft. The next cycle of beach stabilization activities is expected to begin sometime in 2027 and at a minimum will likely include beach renourishment and the construction of two new sets of breakwaters somewhere between the two existing breakwaters.

Shoreline Stabilization Design Models

In early 2024, DWR entered into a 5-year contractual agreement with NASA to conduct ecological and geophysical shoreline studies for the specific purpose of informing future shoreline stabilization project designs. To date, the following four reports containing data collected by the geophysical team have been published:

- Bemelmans, C.B., Stalk, C.A., Ciarletta, D.J., and Miselis, J.L. (2025). Coastal multibeam bathymetry and backscatter data collected in June 2024 from Wallops and Assawoman Islands, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P14SGUMT.
- Forde, A.S., Stalk, C.A., Ciarletta, D.J., and Miselis, J.L. (2025). Chirp sub-bottom profile geophysical data collected in 2024 from Wallops Island and Assawoman Island, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P1NZ6CC2.
- Kivimaki, K.E., Hein, E.A., and Hein, C.J., (2025). Dataset: Shorelines of Wallops and Assawoman Islands, Virginia, 2016-2025: William & Mary, data release, https://doi.org/10.25773/5ys8-cs64.
- Lyons, E.O., Bernier, J.C., Nick, S.K., Ciarletta, D.J., and Miselis, J.L. (2025). Coastal single-beam bathymetry and beach elevation data collected in 2024 from Wallops and Assawoman Islands, Virginia: U.S. Geological Survey data release, https://doi.org/10.5066/P1HFYGE6.

Due to the immediacy of the upcoming project cycle, none of the newly published data was incorporated in the 2027 project design. Instead, NASA continued to rely solely on traditional models developed by the US Army Corps of Engineers. DWR strongly encourages NASA to begin engaging with both the geophysical and ecological teams immediately through a structure decision making process or similar approach to (1) establish robust channels of communication and information exchange between the shoreline studies teams and NASA project designers and (2) ensure that alternative project designs are developed and considered in forthcoming stabilization efforts covered under this EA and future assessments.

Extension of Existing Seawall

One of the proposed actions covered in this EA is the extension of the existing 15,900 long rock seawall by another 3,170 ft. This will increase the length of beach that will undergo severe erosion, require additional breakwaters to slow down the loss of sand, and increase the amount of shoreline in

need of renourishment. It is also not clear how the seawall extension will affect Assawoman Island, which is attached to Wallops, or any of the other islands to the south. The VDWR recommends delaying this action until the ecological and geophysical shoreline studies are complete and the information gathered can be incorporated into the seawall extension decision making process.

Biological Monitoring of Offshore Project Activities

Renourishment activities will entail dredging sand from Unnamed Shoal A, which is an unvegetated, offshore sand ridge located roughly 7 miles east of Assateague Island and approximately 1,800 acres in size. If dredging occurs when water temperatures are above 50°F (10°C), there is chance sea turtles will be in the area. In lieu of having protected species observers onboard during dredging operations, NASA assumes a total take of 2.165 federally and state threatened Loggerhead sea turtles and 0.24 federally and state endangered Kemps Ridley sea turtles. **DWR strongly recommends consultation with NOAA Fisheries on the verification of this calculation to ensure take is appropriately addressed.**

The presence of onboard protected species observers (PSO) is one of several reasonable and prudent measures in the most recent National Marine Fisheries Service Biological Opinion (NMFS 2018). On hopper dredges outfitted with munitions and explosives of concern, the PSO primary responsibility is to look for impinged sea turtle carcasses/parts on the draghead every time it is removed from the water. Additionally, PSO can also look for live sea turtles in the area while the dredge is operating and alert the operator if any are detected. It is not clear in the EA if PSO will be onboard during the upcoming dredging cycle. **DWR strongly recommends the presence of onboard PSO during all dredging operations to mitigate impacts upon sea turtles resulting from the proposed activity.**

The EA states a "bridge lookout" would be onboard the hopper dredge to look for federally listed whale species. It is not clear whether this individual will be a trained PSO or a member of the dredge crew. When a listed whale is spotted within 1 km (0.62 mile) of the dredge, dredging operations will cease until the whale is farther than 1 km from the dredge. Should an individual be detected within 1.60 km (1 mile) of the vessel, the vessel will be required to reduce speed to below 14 knots. Lastly, the vessel must maintain a minimum 500-foot buffer to any North Atlantic right whales. **DWR recommends that the "bridge lookout" is a trained PSO able to identify all sea turtle and marine mammal species known to occur in the area and that all dredging operations cease any time a marine mammal (or sea turtle) is detected within 1 km, irrespective of species, and vessel speed is dropped to below 14 knots.**

Biological Monitoring of Onshore Project Activities

Should renourishment activities be scheduled between March 15 and August 31, NASA will ensure that a qualified biological monitor conducts daily surveys of the project site and adjacent areas to detect nesting piping plovers and sea turtles, in accordance with Wallops Flight Facility's Protected Species Monitoring Plan. If piping plover or sea turtle nests are identified, the nests will be clearly marked using exclosures or signage and rope barriers encircling each site. A qualified biological monitor would

conduct daily nest inspections. All on-site personnel would be informed of the nesting status, and all project activities within 1,000 feet of a nest would be suspended or relocated until hatching is complete. **DWR recommends the following modifications and additions to these protocols to avoid significant adverse impacts upon listed/designated SGCN species resulting from the proposed activities:**

1. **All federally and state threatened piping plover, state endangered Wilson's plover, Tier IIa American oystercatcher nests (hereafter collectively referred to as shorebird nests) and sea turtle nests should be clearly marked with a 25 ft. diameter rope barrier encircling each nest.**
2. **Seabird colonies should be clearly marked with signage and/or rope barriers.**
3. **Exact locations of individual shorebird nests, sea turtle nests and seabird colonies should be conveyed to all on-site personnel immediately upon detection.**
4. **All project activities within 1,000 ft of a shorebird nest or seabird colony should be suspended or relocated until the nests have hatched *or* the adults abandoned the territory.**
5. **When shorebird and seabird nests hatch, the biological monitor will be responsible for locating broods and reporting their locations to all on-site personnel daily.**
6. **All project activities within 1,500 feet of a shorebird or seabird brood should be suspended or relocated until the chicks have fledged or died *and* the adults have abandoned the territory.**
7. **Project activities should *not* be allowed to resume when a brood moves beyond the 1,500 ft buffer on any given day.**
8. **If a sea turtle crawl is detected, the biological monitor should notify the VDWR immediately and take close-up photos of the crawl and all areas where the turtle appeared to dig. The VDWR will send staff to confirm the presence of eggs based on the photos received from the biological monitor. If eggs are found, the VDWR will provide on-site instructions on nest and hatchling management.**

Assuming adherence to our recommendations for the protection of listed species and/or designated resources under our jurisdiction, as depicted in **bolded font** above, and assuming strict adherence to best management practices for erosion and sediment control is maintained, we find this project to be consistent with the Wildlife and Inland Fisheries and Commonwealth Lands Enforceable Policies of the Coastal Zone Management Program.

If the applicant does not adhere to the above-referenced condition, then the project would be inconsistent with the wildlife and inland fisheries enforceable policy for the following reason:

- The proposed activities, if occurring without the above bolded conservation measures, may adversely impact shorebirds, seabirds, marine mammals, and sea turtles, which are protected species in the Commonwealth of Virginia.

Thank you,

Tamara

Tamara Doucette

Environmental Services Biologist

P 804.367.8364

Virginia Department of Wildlife Resources

CONSERVE. CONNECT. PROTECT.

A 7870 Villa Park Dr., P.O. Box 90778, Henrico, VA 23228-0778

www.virginiawildlife.gov


N
W
E
S
Atlantic Ocean
2025 Wallops Island Nesting
Piping Plover
Least Tern
American Oystercatcher
Approximate Sand Renourishment Area
0 0.25 0.5 1 Miles
VGIN, Vantor


N
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Atlantic Ocean
American Oystercatcher
Piping Plover
Least Tern
Nesting Barrier
American Oystercatcher 1000 ft. Buffer
Least Tern 100 ft. Buffer
Approximate Sand Renourishment Area
0
0.25
0.5
1 Miles
VGIN, Vantor

COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Building 96
Fort Monroe, VA 23651

David L. Bulova
Secretary of Natural
and Historic Resources

Joseph D. Grist
Acting Commissioner

March 2, 2026

Department of Environmental Quality
Attn: Julia Wellman
1111 East Main Street
Richmond, VA 23219

Re: NASA Wallops Flight Facility Shoreline Protection Program, DEQ 26-015F, Federal Consistency Certification

Dear Ms. Wellman:

This will respond to the request for comments regarding the Federal Consistency Certification for the National Aeronautics and Space Administration (NASA) Wallops Flight Facility Shoreline Protection Program project (DEQ #26-015F), prepared by NASA. Specifically, NASA has proposed to construct up to 12 stone breakwaters, place sand for beach nourishment, and to extend an existing riprap seawall at their facility on Wallops Island situated along the Atlantic Ocean. The project is located in Accomack County.

We reviewed the provided documents and found the proposed project is within the jurisdictional areas of the Virginia Marine Resources Commission (VMRC) and will require a permit from this agency. Please be advised that the 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. Additionally, 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:

Marine Fisheries: No private shellfish leases or public Baylor grounds are present within or adjacent to the project area. Impacts to fisheries within Virginia's territorial waters are anticipated to be minor to negligible.

Subaqueous Lands: The placement of sand and construction of breakwaters on state-owned submerged lands will require a permit from this agency.

Tidal and Non-Tidal Wetlands: None in close proximity to the project area.

Dunes and Beaches: While Federal properties are not part of Virginia's designated Coastal Zone, since the proposed activities may affect other areas within the Coastal Zone, a dune and beach permit may be required from this agency.

While we have no objection to the consistency findings provided by the applicant, our final consistency recommendation cannot be reached until completion of our permit review process. Any permit issued by the VMRC will specify necessary special conditions for the project. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

Please contact me at (757) 247-2285 or by email at claire.gorman@mrc.virginia.gov if you have questions. Thank you for the opportunity to comment.

Sincerely,

Claire Gorman
Environmental Engineer, Habitat Management

CG/ou
HM

Ms. Julia Wellman
Office of Environmental Impact Reviews
Department of Environmental Quality
PO Box 1105
Richmond, VA 23218

27 February 2026

Dear Ms. Wellman:

We have reviewed the documentation for the Federal Consistency Determination and draft Environmental Assessment (EA) for the NASA Wallops Flight Facility (WFF) Shoreline Protection Program (DEQ #26-015F). VIMS scientists have been engaged by NASA (through the Virginia Department of Wildlife Resources) in the ongoing Shoreline Resiliency Study (SRS; from 2024–2029), which aims to evaluate both physical and ecological responses to shoreline stabilization actions and inform future actions. The information presented here is a combination of our existing scientific knowledge and site-specific observations and data.

Wallops Island is unique among the Virginia Eastern Shore barrier islands as it is the only island to use hard structures on the open Atlantic Ocean shoreline to combat erosion. This is necessary to continue the safe launches of rockets from WFF while minimizing risks to nearby human populations and infrastructure. This requires that launch pads are located at the southern portion of the island, which is also where erosion is greatest. Accelerated erosion on southern Wallops Island is largely attributed to a nodal zone where longshore currents diverge, driving sediment both to the north and south. This is because the southern "hook" of Assateague Island is approximately three miles seaward of the northern approximately two miles of Wallops Island. This causes dominant northeast wind-driven waves to refract around southern Assateague to set up the nodal zone on Wallops Island. It is this longshore current divergence that has caused the greatest erosion of the island at the location of the launch pads and accretion of sediment at the northern end of the island. Preliminary analysis of SRS data indicates that the nodal zone is currently centered near the location of the southern set of existing breakwaters and that it shifts seasonally by approximately one half mile along the beach, following regional wave patterns (see figures 1A and 1C for the shoreline evolution landward of the breakwater sets that indicates dominant longshore sediment transport to the north). This indicates that sand currently trapped by the breakwaters is mostly that which would otherwise be transported to the north rather than being transported south to Assawoman Island and beyond.

The stated goal of the WFF Shoreline Protection Program is to reduce direct damage to the infrastructure on the island. The proposed method for doing so is some combination of sand nourishment from an offshore shoal, constructing up to 12 additional breakwaters between the two existing sets, and/or repairing and extending the large rock revetment to the south. This work is proposed over the next seven years and will be done as funds become available. We submitted scoping comments for this proposed project (15 February 2024, attached for reference) and while our comments were adequately summarized in the EA, they were not adequately addressed as indicated in the Summary of Scoping Comments (table 1.5-1). The following is a summary of our scoping comments (in italics) and how they were/were not addressed in the EA.

1. *Evaluate the previous shoreline stabilization action to inform the proposed design:* A discussion of previous shoreline stabilization actions was discussed in section 1.0; however,

only brief qualitative information and three oblique aerial photos are presented regarding the effectiveness of the previous project.

2. *Model alternatives with and without beach nourishment:* The summary table indicates this will be addressed in section 2.0 though that is not the case. Section 3.2.2. mentions that breakwaters would be located "closer to the existing shoreline" if beach nourishment did not occur, but no specific information regarding their placement or modeling of this scenario is presented.
3. *Evaluate the sand borrow area at the north end of the island to determine if restoration is warranted*: This comment is not included in the summary table. The borrow area is discussed in section 2.4.1 as an alternative that was not carried forward for this round of construction, though it may be considered for future projects. Noted in this section is that the beach borrow area was anticipated to recover in about five to six years after its use for the 2020/2021 project (as indicated in the 2019 final EA), though to date, the borrow area remains a shallow tidal lagoon fronted by a barrier beach.
4. *Evaluate breakwater alignments at the existing locations (200 feet offshore) and closer, attached breakwaters to determine optimal structure location for sediment trapping and shoreline stabilization*: The summary table indicates this comment is addressed in section 2.2.2. That section discusses the construction method alternatives for the breakwaters but does not indicate that any alignment other than 200 feet from the shoreline was considered. Modeling is mentioned but no results are presented and the citation (USACE 2025) referenced in the text is listed in the references section as "U.S. Army Corps of Engineers (USACE). 2025. TBD – design and modeling report." The information that is assumed to be included in this report is invaluable to our review of this project. Several VIMS scientists participated in the 2nd Annual Wallops Shoreline Studies Meeting on 13 January 2026 where USACE representatives presented an overview of the numerical modeling conducted for this project. That presentation indicated that modeling was only conducted for breakwaters located 200 feet from the shoreline and in various groupings.
5. *Modeling of the system should be regional to more accurately represent the system:* As above, the USACE modeling report was not available and the EA did not discuss the model setup or results; however, the 13 January presentation showed that the area modeled for waves, currents, and winds included Assawoman and southern Assateague islands.

In addition to the recommendations and concerns raised in our scoping comments, we offer the following recommendations and comments based on the information presented in the documentation provided.

A. As reported in the EA, the median grain size found on the Wallops beach in 2007 and 2009 was 0.18–0.27 mm and immediately after nourishment from unnamed shoal A, the median grain size was coarser at 0.28–0.54 mm. SRS quarterly sampling along the mid-beach from October 2024 to July 2025 shows a median grain size of 0.26 mm with a range of 0.19–0.40 mm. Taking the post-nourishment values as proxy for the sediment composition of the shoal, that sediment remains slightly coarser than what is currently on the beach and is therefore appropriate for nourishment at this site.
B. In October 2025 a section of the dune field proximal to the fire station was graded flat to allow for the Navy to install an antenna array (figure 2). The southwest corner of this area extends through the primary dune and into the upper beach. This lower elevation could act as a surge

channel during high water events. To reduce this risk, we recommend building and planting dunes along this wider section of beach to prevent waves/water from reaching the antenna array or the existing revetment.

C. The detached breakwaters are functioning to hold sand in salients and have resulted in a wider beach landward of them. However, we recommend that future structures are aligned closer to shore to both reduce the footprint required (and therefore the volume of rock needed) and increase their shoreline stabilization functionality. Attached breakwaters that are nourished at the time of construction reduce the wave energy that reaches the shoreline and more effectively hold sediment in tombolos as compared with detached breakwaters. This means subsequent beach nourishment cycles can be extended or eliminated, reducing future impacts.

D. The revetment extension to the south is likely to result in continued narrowing of that portion of the beach, as has occurred in the area between the breakwater sets (figure 1C). As the nodal zone of divergent sediment transport likely extends into that area, at least seasonally, we recommend careful monitoring after the revetment is extended to determine if additional breakwaters are warranted to the south of the existing southern set to adequately protect this reach while still minimizing impacts to sediment transport to Assawoman Island.

E. Longshore sediment transport occurs predominantly from south to north beginning near the southern breakwater set and continuing northward. Therefore, we recommend breakwaters are constructed from south to north to best retain beach nourishment material over time if they are not constructed at the same time.

F. As Wallops Island continues to be held in place, Assawoman Island continues to move landward through natural overwash processes. Over time, Assawoman is likely to become offset landward from Wallops at the southernmost extent of the revetment, similar to the southern end of Long Beach Island, NJ at the northern end of Forsythe National Wildlife Refuge. Currently, the beach seaward of camera Z-100 has narrowed such that it is not typically exposed at high tide. As Assawoman migrates, Hog Creek may again connect to the ocean, recreating a tidal inlet between the islands that was last open in 1986.

In summary, the shoreline protection strategy proposed here does not adequately consider lessons learned from the previous project built 2020–2021, and while the SRS is not complete, there are preliminary findings regarding both the physical and ecological current conditions and response to the previous project that can help inform this seven-year project. It is our understanding that the subaqueous portion of the project will require a permit from the Virginia Marine Resources Commission, and we anticipate reviewing that application once it is submitted. Please let me know if you have any questions or require additional information.

Sincerely,

Emily Hein

Emily Hein
Assistant Director for Advisory Services

Copy: VMRC Habitat Management Division

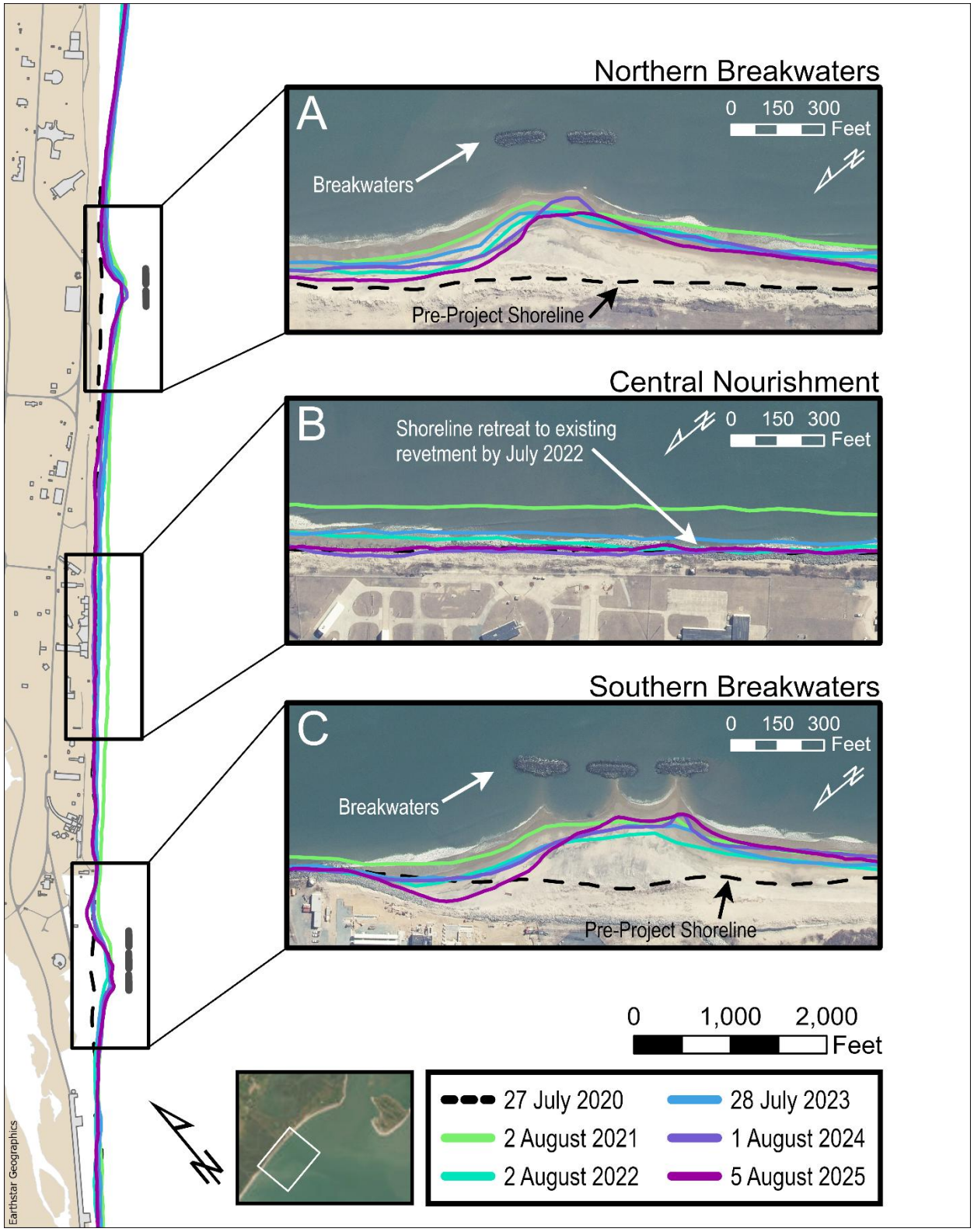

Figure 1: Yearly mid-tide shoreline locations along the area of potential breakwater construction. Insets A and C depict the northern and southern breakwaters sets, respectively, and inset B shows the revetted area between the breakwaters. Insets use Virginia Geographic Information Services spring 2025 background imagery. Data from: Kivimaki, Katherine E.; Hein, Emily A.; and Hein, Christopher J., "Dataset: Shorelines of Wallops and Assawoman islands, Virginia, 2016-2025" (2025). Data. William & Mary. https://doi.org/10.25773/5ys8-cs64. Figure: Katherine Kivimaki.

Figure 2: Oblique aerial image of Wallops Island taken 12 January 2026 looking south with the graded antenna array area in the right foreground. The two pairs of breakwater sets and launch pad infrastructure can be seen in the background. Image: Emily Hein.

VIMS | William & Mary
Virginia Institute of Marine Science

Office of Research and Advisory Services

15 February 2024

Ms. Shari Miller
Center NEPA Manager
NASA Wallops Flight Facility

Dear Ms. Miller:

This letter is in response to your request for scoping comments regarding the Environmental Assessment for the proposed Shoreline Protection Program at Wallops Island. The actions under consideration include dredging sand from Unnamed Shoal A, constructing a series of offshore breakwaters, and extending the existing seawall to the south.

The previous shoreline stabilization project at this site involved mining approximately 1.1 million cubic feet of sand from the beach at the north end of Wallops Island to nourish the beach to the south of the borrow site and construction of five offshore breakwaters. To adequately assess the anticipated environmental impacts of the potential proposed actions, it is first necessary to evaluate the actual impacts of this similar existing project. The existing project was completed in 2020, so while the breakwaters are at the beginning of their anticipated 50-year design life, two- and three-dimensional shoreline and beach change timeseries data in addition to biological recovery data can provide insights into how the system has and will continue to evolve. The sand borrow area at the north of the island remains largely flooded and we recommend evaluation of that area and the potential need for restoration also be included.

We recommend that alternatives with and without continued beach nourishment cycles are evaluated to assess how impacts beyond the project footprint differ if such nourishment activities are not funded in the future. An assessment of the efficacy of the breakwaters at the proposed 200 feet offshore (i.e. the alignment of the existing breakwaters) and closer to the beach would also prove valuable to assess their optimal location for sediment trapping and shoreline stabilization. Additionally, as Wallops Island is part of a larger complex system, the study area for any numerical modeling efforts should extend beyond the island to capture those areas that influence sediment transport and hydrodynamics in the project vicinity. This area should include Chincoteague Inlet to the north, Fishing Point of Assateague Island to the east, and, at minimum, Assawoman Island to the south.

Please let me know if you have any questions.

Sincerely,

Emily Hein
Assistant Director
for Advisory Services

P. O. Box 1346 • 1370 Greate Road • Gloucester Point, Virginia 23062 USA
804.684.7381 • oras@vims.edu • www.vims.edu

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: February 13, 2026

Project: NASA Wallops Flight Facility Shoreline Protection Program, DEQ #26-015F

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 Mariama Ouedraogo, DEQ-TRO at (757) 407-2855 or wendbebe.savadogo@deq.virginia.gov .

Land Program (Solid and Hazardous Waste):
All construction and demolition waste, including any excess soil, must be characterized in accordance with the Virginia Solid and 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:
A construction general permit (CGP) is required prior to commencement of land disturbing activities greater than 1 acre for the discharge of sediment from construction activities. An approved Erosion and Sediment Control Plan (<1 acre of land disturbance) or an approved Stormwater Management Plan (>1 acre of land disturbance) is required prior to commencement of any land disturbing activities. In addition, DEQ is the review authority for state and federal plan review and approval, within the Tidewater Region, to coincide with permit application processing. For additional information, contact Courtney Smith, DEQ-TRO at (757) 493-1072.

Virginia Water Protection Permit Program (VWPP):
Potential adverse impacts to water quality and wetlands resulting from surface runoff due to construction 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):

Wallops Flight Facility currently discharges stormwater under VPDES Permit Number VA0024457. There does not appear to be any point source discharges of processed water or wastewater associated with this project that would necessitate a change to the VPDES permit. For additional information, please contact Loan Pham, DEQ-TRO at Loan.Pham@deq.virginia.gov.

Petroleum Storage Tank Program:

DEQ records do not indicate any reported 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.

Outlook

Fw: reminder: NEW PROJECT NASA WFF Shoreline Protection Program, DEQ 26-015F

From Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>
Date Thu 2/26/2026 8:48 AM
To Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Wallops Island is not subject to the Bay Act.

Daniel Moore
Principal Environmental Planner
Office of Watersheds and Local Government Assistance
Virginia Department of Environmental Quality
1111 E. Main Street
Richmond, VA 23219
(804) 774-9577
daniel.moore@deq.virginia.gov

From: Christian, Maura (DEQ) <Maura.Christian@deq.virginia.gov>
Sent: Wednesday, February 25, 2026 2:48 PM
To: Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>
Subject: Re: reminder: NEW PROJECT NASA WFF Shoreline Protection Program, DEQ 26-015F

I don't have this one in my inbox, but if it is at Wallops Island that is outside the bay watershed anyways.

Maura Christian
Chesapeake Bay Outreach Coordinator, Office of Watersheds and Local Government Assistance
Virginia Department of Environmental Quality
1111 E Main Street, Richmond 23219
804-845-6882

From: Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>
Sent: Wednesday, February 25, 2026 2:39 PM
To: Christian, Maura (DEQ) <Maura.Christian@deq.virginia.gov>
Subject: Fw: reminder: NEW PROJECT NASA WFF Shoreline Protection Program, DEQ 26-015F

Did I assign this one to you?

Outlook

RE: NEW PROJECT NASA WFF Shoreline Protection Program, DEQ 26-015F

From Baber, Mickey (DEQ) <Mickey.A.Baber@deq.virginia.gov>
Date Mon 2/23/2026 9:58 AM
To Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Cc Angueira, Antony (DEQ) <Antony.Angueira@deq.virginia.gov>; DEQ-OSWM <StandardsAndSpecs@deq.virginia.gov>

Good Morning,

Here are the OSWM comments for DEQ 26-015F. Thank you.

a. **Non-point Source Water Pollution**. The policy addresses the control of stormwater runoff to protect the quality and quantity of state waters from the potential harm of unmanaged stormwater. Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by DEQ (*Virginia Code §§ 62.1-44.15:25, 62.1-44.15:52; 9VAC25-875-10 et. seq.*).

b. **Erosion and Sediment Control and Stormwater Management Plans.** The Applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in Virginia must comply with *VESCL&R* and *VSWML&R*, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of ≥10,000 square feet (≥2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of ≥1 acre (≥2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Applicant must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for compliance review. The Applicant is ultimately responsible for achieving project compliance through oversight of onsite contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [ref: VESCL §62.1-44.15 et seq.; consolidated ESC/SWM regs 9VAC25-875-10 et. seq.]

c. **General Permit for Stormwater Discharges from Construction Activities (VAR10).** DEQ is responsible for the issuance, denial, revocation, termination, and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm

sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the VSMP.

The owner or operator of projects involving land-disturbing activities of ≥1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan (SWPPP). Construction activities requiring registration also include land disturbance of <1 acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb ≥1 acre The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the *VSMP Permit Regulations*. [ref: Virginia Stormwater Management Act 62.1-44.15 et seq.; VSMP Permit Regulations *9*VAC25-880 *et seq.*]

V/R,

Mickey Baber
Standards and Specifications Coordinator
Office of Stormwater Management
Virginia Department of Environmental Quality
1111 E. Main St., Suite 1400
Richmond, VA 23219
804-659-1535

From: Fulcher, Valerie (DEQ) <Valerie.Fulcher@deq.virginia.gov>
Sent: Thursday, January 22, 2026 2:27 PM
To: dgif-ESS Projects (DWR) <ESSProjects@dwr.virginia.gov>; Tignor, Keith (VDACS) <Keith.Tignor@vdacs.virginia.gov>; DCR-PRR Environmental Review (DCR) <envreview@dcr.virginia.gov>; odwreview (VDH) <odwreview@vdh.virginia.gov>; Churchill, Nikolas (DEQ) <Nikolas.Churchill@deq.virginia.gov>; Frantz, Allyson (DEQ) <Allyson.B.Frantz@deq.virginia.gov>; Lovain, Ava (DEQ) <Anna.Lovain@deq.virginia.gov>; Angueira, Antony (DEQ) <Antony.Angueira@deq.virginia.gov>; Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>; Hannah, Jeffrey (DEQ) <Jeffrey.Hannah@deq.virginia.gov>; Henderson, Samantha (DHR) <Samantha.Henderson@dhr.virginia.gov>; advisory@vims.edu; MRC - Scoping (MRC) <Scoping@mrc.virginia.gov>; Meil, Elaine <emeil@a-npdc.org>; administration@co.accomack.va.us
Cc: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Subject: NEW PROJECT NASA WFF Shoreline Protection Program, DEQ 26-015F

Good afternoon- this is a new OEIR review request/project:

Document Type: Draft Environmental Assessment/Federal Consistency Determination

Project Sponsor: National Aeronautics and Space Administration

Project Title: NASA Wallops Flight Facility Shoreline Protection Program

Location: Accomack County

Project Number: DEQ #26-015F

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

TO: Julia Wellman, DEQ/EIR Environmental Program Planner

FROM: Nikolas I. Churchill, Division of Land Protection & Revitalization Review Coordinator

DATE: February 6, 2026

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; file

SUBJECT: Environmental Impact Review: 26-015F NASA Wallops Flight Facility Shoreline Protection Program in Accomack County, Virginia.

The Division of Land Protection & Revitalization (DLPR) has completed its review of the National Aeronautics and Space Administration's January 22, 2026 EIR for 26-015F NASA Wallops Flight Facility Shoreline Protection Program in Accomack County, Virginia.

DLPR staff conducted a search (200 ft. radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified one (1) CERCLA site within the project area which might impact the project.

DLPR staff has reviewed the submittal and offers the following comments:

***Hazardous Waste/RCRA Facilities* – none in close proximity to the project area.**

***CERCLA Sites* – One (1) found in close proximity to the project area.**

1. ***EPA ID VA8800010763, NASA Wallops Flight Facility, 32400 Fulton Street, Wallops Island, VA 23337, Not on the NPL***

***Formerly Used Defense Sites (FUDS)* – none in close proximity to the project area.**

***Solid Waste* – none in close proximity to the project area.**

***Virginia Remediation Program (VRP)* – none in close proximity to the project area.**

***Petroleum Releases* – none in close proximity to the project area.**

PROJECT SPECIFIC COMMENTS

None

GENERAL COMMENTS

Soil, Sediment, Groundwater, and Waste Management

Any soil, sediment or groundwater that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

All structures being demolished/renovated/removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and 9VAC 20-60-261 for LBP must be followed. Questions may be directed to the DEQ's Tidewater Regional Office at (757) 518-2000.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Nikolas Churchill by phone at (804) 659-2663 or email nikolas.churchill@deq.virginia.gov.

David L. Bulova
Secretary of Natural and Historic Resources

Nikki Rovner
Director

Sarah Spota
Deputy Director

Frank N. Stovall
Deputy Director for Operations

Darryl Glover
Deputy Director for Dam Safety, Floodplain Management and Soil and Water Conservation

Laura Ellis
Deputy Director for Administration and Finance

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

MEMORANDUM

DATE: February 23, 2026

TO: Julia Wellman, DEQ

FROM: Allison Tillett, Environmental Impact Review Coordinator

SUBJECT: DEQ 26-015F, NASA Wallops Flight Facility Shoreline Protection Program Draft EA

Division of Planning and Recreation Resources

DCR's Division of Planning and Recreational Resources (DCR-PRR) administers the Virginia Scenic Rivers (Virginia Code § 10.1-200), state trails programs (Virginia Code §10.1-204), and the state park master planning process (Virginia Code §10.1-200.1). DCR-PRR develops the Virginia Outdoors Plan (VOP), the state's comprehensive outdoor recreation and open space plan (Virginia Code §10.1-200) and administers the state-assistance side of the Land and Water Conservation Fund (LWCF). The VOP recognizes the importance of scenery, natural landscapes, and access to recreational opportunities for Virginians.

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 in our files, the Wallops - Assawoman Islands Conservation Site is located within the project area. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking (B-rank) based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. The Wallops - Assawoman Islands Conservation Site has been assigned a B-rank of B1, which represents a site of outstanding significance. The natural heritage resources associated with this site are:

Ammospiza caudacuta	Saltmarsh Sparrow	G2/S2B,S3N/SOC/NL
Caretta caretta	Loggerhead (Sea Turtle)	G2G4/S1B,S1N/LT/LT
Charadrius melodus	Piping Plover	G3/S2B,S1N/LT/LT
Charadrius wilsonia	Wilson's Plover	G5/S1B/NL/LE

Circus hudsonius	Northern Harrier	G5/S1S2B,S3N/NL/NL
Eupatorium maritimum	Seaside Thoroughwort	G2?/S1/SOC/NL
Euphorbia bombensis	Southern seaside spurge	G4G5/S2/NL/NL
Falco peregrinus	Peregrine Falcon	G4/S1B,S2N/NL/LT
Juncus megacephalus	Big-headed rush	G4G5/S2/NL/NL
Papaipema araliae	Aralia Shoot Borer Moth	G3G4/S2S3/NL/NL
Papaipema duovata	Seaside Goldenrod Stem Borer	G2G3/S2S3/SOC/NL
Rynchops niger	Black Skimmer	G5/S2B,S1N/NL/NL
Sternula antillarum	Least Tern	G4/S2B/NL/NL
Black Cherry Xeric Dune Woodland		G1G2/S1/NL/NL
Interdune Swale (Northern Mixed Grassland Type)		G1G2/S1?/NL/NL
Interdune Swale / Pond		G2/S2/NL/NL
Low Salt Marsh (Salt Panne Type)		GNR/S3?/NL/NL
Wax Myrtle Interdune Shrubland		G3G4/S2S3/NL/NL
Xeric Backdune Grassland		G2/S2/NL/NL
Bird Nesting Colony		G5/SNR/NL/NL

Due to the legal status of some of the species listed above, DCR recommends continued coordination with the U.S Fish and Wildlife Service (USFWS), NOAA Fisheries, and the Virginia Department of Wildlife Resources (VDWR) to ensure compliance with protected species legislation. DCR supports the planned mitigation measures to reduce the probability and intensity of potential effects to protected species. DCR also supports the VMRC permit terms to reduce the effects on special status species that were issued during the 2021 permit and consultation modifications to revise breakwater construction from in-water barge to temporary bulkheads. DCR requests the opportunity to review specific reasonably foreseeable future actions and mitigation measures for this project as they are developed.

In addition, according to DCR's predicted suitable habitat modeling and review by a DCR biologist, there is a potential for sea-beach amaranth (*Amaranthus pumilus*, G2/S1/LT/LT) to occur in the project area if suitable habitat exists on site. Please coordinate with DCR if any occurrences of sea-beach amaranth are documented.

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 Virginia Department of Conservation and Recreation (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.

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 Virginia Department of Wildlife Resources (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 at https://services.dwr.virginia.gov/fwis/ or contact Susan Watson at Susan.Watson@dwr.virginia.gov.

The U.S. Fish and Wildlife Service (USFWS) utilizes an online project review process (https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process) to facilitate compliance with the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884) (ESA), as amended. The

process enables users to 1) follow step-by-step guidance; 2) access information that will allow them to identify threatened and endangered species, designated critical habitat, and other Federal trust resources that may be affected by their project; and 3) accurately reach determinations regarding the potential effects of their project on these resources as required under the ESA. If you have questions regarding the online review process, please contact virginiafieldoffice@fws.gov.

For additional information about species under NOAA's jurisdiction in Virginia, please see https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultations-greater-atlantic-region.

Division of State Parks

DCR's Division of State Parks is responsible for acquiring and managing state parks. Park development and master planning are managed by the Division of Planning and Recreation Resources. Master plans are required prior to a parks opening and are updated every ten years (Virginia Code § 10.1-200 *et seq.*).

Division of Dam Safety and Floodplain Management

Dam Safety Program:
The Dam Safety program was established to provide proper and safe design, construction, operation and maintenance of dams to protect public safety. Authority is bestowed upon the program according to *The Virginia Dam Safety Act*, Article 2, Chapter 6, Title 10.1 (10.1-604 et seq) of the Code of Virginia and Dam Safety Impounding Structure Regulations (Dam Safety Regulations), established and published by the Virginia Soil and Water Conservation Board (VSWCB).

Floodplain Management Program:

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

State Agency Projects Only

All agencies and departments of the Commonwealth shall comply with the Code of Virginia § 10.1-603. State agency compliance.

Federal Agency Projects Only
Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

DCR's Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must reach out to the local floodplain administrator for an official floodplain determination and comply with the community's local floodplain ordinance, including receiving a local permit. Failure to comply

with the local floodplain ordinance could result in enforcement action from the locality. For state projects, DCR recommends that compliance documentation be provided prior to the project being funded. For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS): www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Cc: Hannah Schul, VDWR

Outlook

RE: NEW PROJECT NASA WFF Shoreline Protection Program, DEQ 26-015F

From Fields, Arlene (VDH) <Arlene.Fields@vdh.virginia.gov>
Date Thu 1/29/2026 3:30 PM
To Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Project: 25-015F
Project Name: NASA Wallops Flight Facility Shoreline Protection Program
UPC #: N/A
Location: Accomack County

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.

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 Fields
GIS Program Support Technician
Mobile 686-203-3867 (office/cell/text)
Email arlene.fields@vdh.virginia.gov
VDH, Office of Drinking Water
109 Governor Street, 7th Floor
Richmond, VA 23219

From: Fulcher, Valerie (DEQ) <Valerie.Fulcher@deq.virginia.gov>
Sent: Thursday, January 22, 2026 2:27 PM
To: dgif-ESS Projects (DWR) <ESSProjects@dwr.virginia.gov>; Tignor, Keith (VDACS) <Keith.Tignor@vdacs.virginia.gov>; DCR-PRR Environmental Review (DCR) <envreview@dcr.virginia.gov>; odwreview (VDH) <odwreview@vdh.virginia.gov>; Churchill, Nikolas (DEQ) <Nikolas.Churchill@deq.virginia.gov>; Frantz, Allyson (DEQ) <Allyson.B.Frantz@deq.virginia.gov>; Lovain, Ava (DEQ) <Anna.Lovain@deq.virginia.gov>;

Outlook

WFF Shoreline Protection Program, DEQ 26-015F (DHR File No. 2026-3107) | e-Mail #04548

From Chelsea Jeffries <Chelsea.Jeffries@dhr.virginia.gov>
Date Fri 2/20/2026 12:29 PM
To Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Dear Ms. Wellman,

DHR has been in direct consultation with NASA regarding this project and reached consensus that the Shoreline Protection Program Project will result in no historic properties affected. DHR has no further comment at this time.

Sincerely,

Chelsea Jeffries, Architectural Historian
Department of Historic Resources
Review and Compliance Division
Phone: (804) 482-8097
Chelsea.Jeffries@dhr.virginia.gov

Appendix C
Air Quality Calculations

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TAB A.

Emissions Summary for Alternative 1

This summary assumes breakwater and seawall stone delivery via rail

Alternative 1 includes beach renourishment, construction of 4 breakwaters, and seawall extension

Activity	Location	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
Beach Renourishment	Onsite	13.3	41.4	253.5	0.28	6.69	6.47	28,905
	Offsite	0.3	0.8	5.0	0.01	0.13	0.13	558
Breakwater Construction	Onsite	0.7	2.2	9.3	0.01	0.44	0.42	3,476
	Offsite	0.1	0.3	1.3	0.00	0.09	0.04	118
Seawall Extension	Onsite	0.1	0.4	1.3	0.00	0.07	0.07	1,126
	Offsite	17.6	96.5	435.5	0.34	11.41	10.74	33,693
Subtotal Onsite		14.1	44.0	264.1	0.30	7.19	6.96	33,507
Subtotal Offsite		17.9	97.6	441.9	0.35	11.6	10.9	34,370
Total		32.0	141.6	705.9	0.64	18.83	17.88	67,877

Emissions Summary for Alternative 2

This summary assumes seawall stone delivery via rail

Alternative 2 includes beach renourishment and seawall extension

Activity	Location	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
Beach Renourishment	Onsite	13.3	41.4	253.5	0.28	6.69	6.47	28,905
	Offsite	0.3	0.8	5.0	0.01	0.13	0.13	558
Seawall Extension	Onsite	0.1	0.4	1.3	0.00	0.07	0.07	1,126
	Offsite	17.6	96.5	435.5	0.34	11.41	10.74	33,693
Subtotal Onsite		13.4	41.8	254.8	0.29	6.76	6.54	30,031
Subtotal Offsite		17.9	97.3	440.5	0.35	11.54	10.87	34,252
Total		31.2	139.1	695.4	0.63	18.30	17.41	64,283

Emissions Summary for Alternative 3

This summary assumes breakwater and seawall stone delivery via rail

Alternative 3 includes construction of 4 breakwaters and seawall extension

Activity	Location	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
Breakwater Construction	Onsite	0.7	2.2	9.3	0.01	0.44	0.42	3,476
	Offsite	0.1	0.3	1.3	0.00	0.09	0.04	118
Seawall Extension	Onsite	0.1	0.4	1.3	0.00	0.07	0.07	1,126
	Offsite	17.6	96.5	435.5	0.34	11.41	10.74	33,693
Subtotal Onsite		0.8	2.6	10.6	0.01	0.51	0.49	4,602
Subtotal Offsite		17.6	96.8	436.8	0.34	11.50	10.78	33,811
Total		18.4	99.4	447.4	0.36	12.01	11.27	38,413

HAP emissions for Alternative 1

Activity	Location	Formaldehyde	Benzene	Total HAPs
Beach Renourishment	Onsite	0.57	0.07	0.64
	Offsite	0.01	0.00	0.01
Breakwater Construction	Onsite	0.03	0.17	0.20
	Offsite	0.00	0.00	0.00
Seawall Extension	Onsite	0.00	0.02	0.02
	Offsite	0.01	0.00	0.01
Subtotal Onsite		0.60	0.26	0.86
Onsite exceed 10-ton individual HAP comparative threshold?		No	No	NA
Onsite exceed 25-ton total HAP comparative threshold?		NA	NA	No
Subtotal Offsite		0.02	0.00	0.02
Total		0.62	0.26	0.88

HAP emissions for Alternative 2

Activity	Location	Formaldehyde	Benzene	Total HAPs
Beach Renourishment	Onsite	0.57	0.07	0.64
	Offsite	0.01	0.00	0.01
Seawall Extension	Onsite	0.00	0.02	0.02
	Offsite	0.01	0.00	0.01
Subtotal Onsite		0.57	0.09	0.66
Onsite exceed 10-ton individual HAP comparative threshold?		No	No	NA
Onsite exceed 25-ton total HAP comparative threshold?		NA	NA	No
Subtotal Offsite		0.02	0.00	0.02
Total		0.59	0.09	0.68

HAP emissions for Alternative 3

Activity	Location	Formaldehyde	Benzene	Total HAPs
Breakwater Construction	Onsite	0.03	0.17	0.20
	Offsite	0.00	0.00	0.00
Seawall Extension	Onsite	0.00	0.02	0.02
	Offsite	0.01	0.00	0.01
Subtotal Onsite		0.03	0.19	0.22
Onsite exceed 10-ton individual HAP comparative threshold?		No	No	NA
Onsite exceed 25-ton total HAP comparative threshold?		NA	NA	No
Subtotal Offsite		0.01	0.00	0.01
Total		0.04	0.19	0.23

TAB B.

Emissions Summary for Alternative 1

This summary assumes breakwater and seawall stone delivery via barge

Alternative 1 includes beach renourishment, construction of 4 breakwaters, and seawall extension

Activity	Location	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Total HAPs
Beach Renourishment	Onsite	13.30	41.43	253.51	0.28	6.69	6.47	28,905	0.64
	Offsite	0.26	0.82	5.05	0.01	0.13	0.13	558	0.01
Breakwater Construction	Onsite	0.22	0.85	3.78	0.01	0.14	0.13	1,279	0.03
	Offsite	0.34	1.05	6.44	0.01	0.17	0.16	713	0.02
Seawall Extension	Onsite	0.07	0.38	1.30	0.00	0.07	0.07	1,126	0.02
	Offsite	1.59	4.96	30.43	0.03	0.80	0.77	3,368	0.08
Total		15.78	49.48	300.51	0.34	7.99	7.74	35,949	0.79

Emissions Summary for Alternative 2

This summary assumes seawall stone delivery via barge

Alternative 2 includes beach renourishment and seawall extension

Activity	Location	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Total HAPs
Beach Renourishment	Onsite	13.30	41.43	253.51	0.28	6.69	6.47	28,905	0.64
	Offsite	0.26	0.82	5.05	0.01	0.13	0.13	558	0.01
Seawall Extension	Onsite	0.07	0.38	1.30	0.00	0.07	0.07	1,126	0.02
	Offsite	1.59	4.96	30.43	0.03	0.80	0.77	3,368	0.08
Total		15.23	47.58	290.29	0.33	7.69	7.45	33,958	0.75

Emissions Summary for Alternative 3

This summary assumes breakwater and seawall stone delivery via barge

Alternative 3 includes construction of 4 breakwaters and seawall extension

Activity	Location	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Total HAPs
Breakwater Construction	Onsite	0.22	0.85	3.78	0.01	0.14	0.13	1,279	0.03
	Offsite	0.34	1.05	6.44	0.01	0.17	0.16	713	0.02
Seawall Extension	Onsite	0.07	0.38	1.30	0.00	0.07	0.07	1,126	0.02
	Offsite	1.59	4.96	30.43	0.03	0.80	0.77	3,368	0.08
Total		2.22	7.23	41.95	0.05	1.17	1.14	6,486	0.14

TAB C.

Emission Calculations for Beach Renourishment 1,500,000 CY of sand + 50% for loss 750,000 2,250,000 Total CY

90 days

Material	Source Location	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled
Mobilization - supplies via truck	Newport News	114	5.1	90	456	20,520
Tug & barge - mob supplies	Norfolk	100	40	10	400	2,000

	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	N2O lb/mile	CH4 lb/mile	CO2 lb/mile	Formaldehyde lb/mile	Benzene lb/mile
Dump/Supply Trucks	1.87E-03	9.87E-03	1.62E-02	1.28E-05	2.18E-03	1.00E-03	1.82E-05	9.62E-05	3.75	0.00	0.00
	VOCs Ton	**CO** Ton	**NOx** Ton	**SO_2** Ton	**PM_{10}** Ton	**$PM_{2.5}$** Ton	**N2O** Ton	**CH4** Ton	**CO2** Ton	**Formaldehyde** Ton	**Benzene** Ton
Dump/Supply Trucks	0.02	0.10	0.17	0.00	0.02	0.01	0.00	0.00	38.48	0.00	0.00
									CO2e in metric tons/year	**35**	

Deliveries	**Engine HP**	**# Engines**	**Load Factor**	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM10** g/hp-hr	**PM2.5** g/hp-hr	**N2O** g/hp-hr	**CH4** g/hp-hr	**CO2** g/hp-hr	**BSFC** lb/hp-hr	**Formaldehyde** g/hp-hr	**Benzene** g/hp-hr
Tugboat - propulsion	2000	2	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.304	0.01	0.00
				VOC Ton	**CO** Ton	**NOx** Ton	**SO2** Ton	**PM10** Ton	**PM2.5** Ton	**N2O** Ton	**CH4** Ton	**CO2** Ton		**Formaldehyde** Ton	**Benzene** Ton
			Tugboat Annual Emissions	0.26	0.82	5.05	0.01	0.13	0.13	0.03	0.00	607.68		0.01	0.00
											CO2e in metric tons/year	**558**			

Equipment Usage	Hours
Derrick barge	332
Work barge	332
Work Tug	6,978
Bulldozer	13,292
Trailing Suction Dredge-propulsion	13,292
Trailing Suction Dredge - pumps	9,305

Equipment and hours are from the 2019 SERP EA. Hours are factored due to increased material usage in this project.

Hours factor: this project will dredge 2,250,000 CY of sand, the 2019 EA calculations were based on 1,625,000 CY of sand.

2,250,000 / 1,625,000 = 1.38

Equipment Emissions

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	N2O g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	BSFC lb/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Derrick barge	332	2,500	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.350	0.01	0.00
Work barge	332	1,000	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.350	0.01	0.00
Work Tug	6,978	500	0.5	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.350	0.01	0.00
Trailing Suction Dredge-propulsion	13,292	4,000	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.350	0.01	0.00
Trailing Suction Dredge - pumps	9,305	2,500	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.350	0.01	0.00

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	N2O lb	CH4 lb	CO2 lb	Formaldehyde lb	Benzene lb
Derrick barge	275	853	5,240	6	137	133	31	2	631,055	12	1
Work barge	110	341	2,096	2	55	53	12	1	252,422	5	1
Work Tug	848	2,635	16,183	18	425	412	95	8	1,948,847	36	4
Trailing Suction Dredge-propulsion	17,571	54,609	335,375	371	8,800	8,536	1,975	159	40,387,533	750	83
Trailing Suction Dredge - pumps	7,687	23,892	146,727	162	3,850	3,735	864	70	17,669,546	328	36
Tons/year:	**13.2**	**41.2**	**252.8**	**0.3**	**6.6**	**6.4**	**1.5**	**0.1**	**30,444.7**	**0.6**	**0.1**
								CO2e in metric tons/year	**27,980**		

Vessel emission factors from page 3-22 of Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder, USEPA 2008.

All vessels are presumed to use 2 propulsion engines, table lists total HP.

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Bulldozer	13,292	215	0.58	0.02	0.09	0.29	0.00	0.02	0.02	0.00	536.77	0.00	0.00

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CH4 lb	CO2 lb	Formaldehyde lb	Benzene lb
Bulldozer	71	323	1,071	5	61	59	6	1,961,522	3	16
Tons/year:	**0.0**	**0.2**	**0.5**	**0.0**	**0.0**	**0.0**	**0.00**	**980.8**	**0.00**	**0.01**
							CO2e in metric tons/year	**890**		

Total Onsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	13.30	41.43	253.51	0.28	6.69	6.47	28,905	0.57	0.07

Total Offsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	0.26	0.82	5.05	0.01	0.13	0.13	558	0.01	0.00

Total Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	13.56	42.25	258.56	0.29	6.82	6.60	29,463	0.58	0.07

TAB D.

Emission Calculations for Breakwater Construction using Temporary Bulkhead

This is the highest emissions case among the three options for building breakwaters.
Assume all stones come via train, and are moved from the railhead to the beach by truck.

Bulkhead construction
Pile driving - vibratory hammer
construction of bulkhead - will be filled with sand, which will be spread on the beach after the bulkhead is removed.
pile removal - vibratory hammer

Equipment
crawler crane
hydraulic excavator
vibratory hammer
dozer

130	ft long			
12	ft wide at top	Type 2 stone (core stone)	300	average lb
14	ft depth		2.3	ft long
65	ft width at base (assumed all breakwaters are the maximum size)		0.78	ft wide
21.5	ft width of long sides		1.45	ft thickness type 2
2,595	CY volume of one breakwater (minus ends)		0.10	CY volume of 1 Type 2 stone
202	CY volume of one breakwater end		3114	lb/cy
3,000	CY Total volume of one breakwater	Type 1 stone (breakwater armor stone)	5300	average lb
4	total	tons	2.65	
1	month construction period per breakwater	Stone Density	165	lb/cf
Rocks brought by rail from quarry			4455	lb/cy
10,000	tons ave train capacity	CY per stone	1.190	
66,667	Type 2 stone capacity for 1 train			
3,774	Type 1 armor stone capacity for 1 train			

2,830	CY of Type 2 stone required for breakwater	Stone percentages from June 2019 Final Environmental Assessment for the Wallops facility, Appendix E
29,369	Total Type 2 stones for 1 breakwater	
0	barges to bring this number of Type 2 stone	
4,405	Total weight of Type 2 stones for 1 breakwater (tons)	
170	CY volume of Type 1 stone in 1 breakwater	Stone percentages from June 2019 Final Environmental Assessment for the Wallops facility, Appendix E
0	barges to bring this number of Type 1 stone	
143	Total Type 1 stones for 1 breakwater	
379	Total weight of Type 1 stones for 1 breakwater (tons)	
4,784	Total weight of all stones for 1 breakwater (tons)	

Truck capacity	12	cy
Number of truck trips	250	
One way truck distance	10	miles

Sand required to fill the temporary bulkhead:

Length	130	feet	
Width	30	feet	
Depth	14	feet	Assumed linear depth progression from 0 at beach to 14 feet at breakwater (same height as breakwater)
Volume of temporary bulkhead	27,300	cubic feet	
	1,011	cubic yards of sand required to fill bulkhead	

Rail delivery from quarry to LeCato railhead

Material	Source Location	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled	
Stone	Quarry	250	14	0	7	239	Per breakwater

	VOC	CO	NOx	SO2	PM10	PM2.5	N2O	CH4	CO2
Stone Deliveries	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal
Rail - propulsion	4.85	26.62	120.50	0.09	3.04	2.95	0.26	0.80	10150
	VOC	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**N2O**	**CH4**	**CO2**
	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Rail Annual Emissions	0.01	0.07	0.30	0.00	0.01	0.01	0.00	0.00	26
								CO2e in metric tons/year	**23**

0.002 gal/ton-miles of freight transported from EPA 2021 SmartWay Rail Carrier Partner Tool: Technical Documentation.

Truck hauling from LeCato railhead to beach

Material	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled
Stone	10	0.57	250	143	4,999

	VOC	CO	NOx	SO2	PM10	PM2.5	N2O	CH4	CO2	Benzene	Formaldehyde
	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT
Highway	0.31	1.74	3.19	0.00	1.37	0.33	0.00	0.01	972.79	0.00	0.02
Side streets	0.61	3.40	5.80	0.00	4.37	0.89	0.01	0.03	1445.15	0.00	0.05
Idle	5.23	21.99	34.17	0.02	2.54	2.34	0.08	0.27	5727.82	0.04	0.41
	VOC	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**N2O**	**CH4**	**CO2**	**Benzene**	**Formaldehyde**
	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Annual Emissions	0.00	0.01	0.03	0.00	0.02	0.00	0.00	0.00	6.75	0.00	0.00
									CO2e in metric tons/year	**6**	

Equipment Usage	Hours
Crawler Crane	1,920
Vibratory Hammer	1,920
Dozer	1,920
Excavator	1,920

Assuming 60 days construction per breakwater, 2 8 hour shifts, and 2 units of each equipment

Equipment Emissions

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Crawler Crane	1,920	150	1	0.04	0.18	0.86	0.00	0.04	0.04	0.00	531	0.002	0.010
Vibratory Hammer	1,920	300	1	0.21	0.56	2.62	0.00	0.12	0.11	0.01	530	0.009	0.055
Dozer	1,920	275	0.58	0.02	0.09	0.29	0.00	0.02	0.02	0.00	537	0.001	0.004
Excavator	1,920	450	0.53	0.03	0.20	0.55	0.00	0.03	0.03	0.00	537	0.001	0.008

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CH4 lb	CO2 lb	Formaldehyde lb	Benzene lb
Crawler Crane	26	111	548	1	26	25	2	337,103	1	6
Vibratory Hammer	268	711	3,331	2	148	144	16	673,592	11	70
Dozer	13	60	198	1	11	11	1	362,400	1	3
Excavator	32	205	554	1	33	32	3	541,859	1	8
Tons/year:	**0.2**	**0.5**	**2.3**	**0.0**	**0.1**	**0.1**	**0.0**	**957.5**	**0.007**	**0.044**
							CO2e in metric tons/year	**869**		

Total Onsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
One Breakwater	0.17	0.54	2.32	0.00	0.11	0.11	869	0.01	0.04
4 Breakwaters	0.68	2.17	9.26	0.01	0.44	0.42	3,476	0.03	0.17

Total Offsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
One Breakwater	0.01	0.08	0.33	0.00	0.02	0.01	30	0.00	0.00
4 Breakwaters	0.06	0.33	1.32	0.00	0.09	0.04	118	0.00	0.00

Total Emissions (tons per year)

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
One Breakwater	0.18	0.63	2.64	0.00	0.13	0.12	898	0.01	0.04
4 Breakwaters	0.74	2.50	10.58	0.01	0.53	0.47	3,594	0.03	0.17

TAB E.

Length	3170	feet
Stone weight	5-7	tons
Average Stone weight	6	tons
Height of wall	17.31	14 feet above MHWL (1.31), plus 2 feet excavation
Top width	14	feet
Bottom width	65.93	feet
Area	691.79415	square feet
Volume	2,192,987	cubic feet
	81,222	cubic yards
Stone density	165	lb/cf
	4455	lb/cy
	2.23	ton/cy
Stone volume	2.69	cy/stone
Number of stones required	30,154	
Total weight of stones	180,921.47	tons
10,000	tons avg train capacity with one engine	
18	Number of trains to deliver all stones	

Truck capacity	12	cy
Number of truck trips	6,768	
One way truck distance	10	miles

tracked excavator
bulldozer

Rail delivery from quarry to LeCato railhead

Material	Source Location	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled
Stone	Quarry	250	14	18	258	9,046

	VOC	CO	NOx	SO2	PM10	PM2.5	N2O	CH4	CO2
Stone Deliveries	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal	g/gal
Rail - propulsion	4.85	26.62	120.50	0.09	3.04	2.95	0.26	0.80	10150
	VOC	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**N2O**	**CH4**	**CO2**
	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Rail Annual Emissions	17.52	96.06	434.78	0.34	10.98	10.65	0.94	2.89	36,623
								CO2e in metric tons/year	**33,523**

0.002 gal/ton-miles of freight transported from EPA 2021 SmartWay Rail Carrier Partner Tool: Technical Documentation.

Truck hauling from LeCato railhead to beach

Material	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled
Stone	10	0.57	6,768	3,868	135,370

	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	N2O g/VMT	CH4 g/VMT	CO2 g/VMT	Benzene g/VMT	Formaldehyde g/VMT
Highway	0.31	1.74	3.19	0.00	1.37	0.33	0.00	0.01	972.79	0.00	0.02
Side streets	0.61	3.40	5.80	0.00	4.37	0.89	0.01	0.03	1445.15	0.00	0.05
Idle	5.23	21.99	34.17	0.02	2.54	2.34	0.08	0.27	5727.82	0.04	0.41
	VOC	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**N2O**	**CH4**	**CO2**	**Benzene**	**Formaldehyde**
	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Annual Emissions	0.07	0.41	0.71	0.00	0.43	0.09	0.00	0.00	187.73	0.00	0.01
									CO2e in metric tons/year	**171**	

Equipment Usage	Hours
Crawler Crane	3,840
Dozer	3,840
Excavator	3,840

Assuming 120 days construction, 2 8 hour shifts, and 2 units of each equipment

Equipment Emissions

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Crawler Crane	3,840	150	1	0.0414138	0.1753584	0.8636454	0.0014719	0.040731732	0.0395098	3.58E-03	530.93	0.002	0.010
Dozer	3,840	275	0.58	0.0195561	0.0883136	0.2930742	0.0014402	0.016561595	0.0160647	1.58E-03	536.77	0.001	0.004
Excavator	3,840	450	0.53	0.0319626	0.2032897	0.5487676	0.0014798	0.032563556	0.0315866	2.82E-03	536.74	0.001	0.008
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM10** lb	**PM2.5** lb	**CH4** lb	**CO2** lb	**Formaldehyde** lb	**Benzene** lb
			Crawler Crane	53	223	1,097	2	52	50	5	674,206	2	12
			Dozer	26	119	396	2	22	22	2	724,800	1	6
			Excavator	65	410	1,108	3	66	64	6	1,083,718	3	16
			Tons/year:	**0.1**	**0.4**	**1.3**	**0.0**	**0.1**	**0.1**	**0.0**	**1,241.4**	**0.00**	**0.02**
											CO2e in metric tons/year	**1,126**	

Total Onsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	0.07	0.38	1.30	0.00	0.07	0.07	1,126	0.00	0.02

Total Offsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	17.59	96.48	435.50	0.34	11.41	10.74	33,693	0.01	0.00

Total Emissions (tons per year)

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Seawall Extension	17.66	96.85	436.80	0.34	11.48	10.81	34,819	0.01	0.02

TAB F.

Emission Calculations for Breakwater Construction

130 ft long
12 ft wide at top
14 ft depth
65 ft width at base (assumed all breakwaters are the maximum size)
21.5 ft width of long sides
2,595 CY volume of one breakwater (minus ends)
202 CY volume of one breakwater end
3,000 CY Total volume of one breakwater
12 total
1 month construction period

Rocks brought by water from Norfolk

1,500 tons ave barge capacity
10,000 Type 2 stone capacity for 1 barge
566 Type 1 armor stone capacity for 1 barge

Deposited using barge excavator

2,830 CY of Type 2 stone required for breakwater
29,369 Total Type 2 stones for 1 breakwater
3 barges to bring this number of Type 2 stone
170 CY volume of Type 1 stone in 1 breakwater
0 barges to bring this number of Type 1 stone
143 Total Type 1 stones for 1 breakwater

Type 2 stone (core stone)
300 average lb
2.3 ft long
0.78 ft wide
1.45 ft thickness type 2
0.10 CY volume of 1 Type 2 stone

Type 1 stone (breakwater armor stone)
5300 average lb
tons 2.65
Stone Density 165 lb/cf
4455 lb/cy
CY per stone 1.190

Stone percentages from June 2019 Final Environmental Assessment for the Wallops facility, Appendix E

Stone percentages from June 2019 Final Environmental Assessment for the Wallops facility, Appendix E

Material	Source Location	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled
Tug & barge - riprap	Norfolk	100	40	3	128	638

Per breakwater

Deliveries	Engine HP	# Engines	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	N2O g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	BSFC lb/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Tugboat - propulsion	2000	2	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.350	0.01	0.00

	VOC Ton	CO Ton	NOx Ton	SO2 Ton	PM10 Ton	PM2.5 Ton	N2O Ton	CH4 Ton	CO2 Ton	Formaldehyde Ton	Benzene Ton
Tugboat Emissions	0.08	0.26	1.61	0.00	0.04	0.04	0.01	0.00	194	0.00	0.00
CO2e in metric tons/year									**178**		

Equipment Usage	Hours
Work Tug	1,920
Excavator	1,920

assumed 2 units of each equipment, working 16 hours per day for 60 days

Equipment Emissions

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	N2O g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Work Tug	1,920	150	0.50	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	506.69	0.01	0.00
Excavator	1,920	450	0.53	0.03	0.20	0.55	0.00	0.03	0.03		0.00	536.74	0.00	0.01

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	N2O lb	CH4 lb	CO2 lb	Formaldehyde lb	Benzene lb
Work Tug	74	218	1,337	1	35	34	8	1	161,063	4	0
Excavator	34	205	554	1	33	32	0	3	541,859	1	8
Tons/year:	**0.1**	**0.2**	**0.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**351.5**	**0.00**	**0.00**
CO2e in metric tons/year									**320**		

All vessels are presumed to use 2 propulsion engines, table lists total HP.

Total Onsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
One Breakwater	0.05	0.21	0.95	0.00	0.03	0.03	320	0.00	0.00
4 Breakwaters	0.22	0.85	3.78	0.01	0.14	0.13	1279.32	0.01	0.02

Total Offsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
One Breakwater	0.08	0.26	1.61	0.00	0.04	0.04	178	0.00	0.00
4 Breakwaters	0.34	1.05	6.44	0.01	0.17	0.16	712.51	0.01	0.00

Total Emissions (tons per year)

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
One breakwater	0.14	0.47	2.56	0.00	0.08	0.07	498	0.01	0.00
4 breakwaters	0.55	1.89	10.22	0.01	0.30	0.30	1991.83	0.03	0.02

TAB G.

Length	3170	feet
Stone weight	5-7	tons
Average Stone weight	6	tons
Height of wall	17.31	14 feet above MHWL (1.31), plus 2 feet excavation
Top width	14	feet
Bottom width	65.93	feet
Area	691.79415	square feet
Volume	2,192,987	cubic feet
	81,222	cubic yards
Stone density	165	lb/cf
	4455	lb/cy
	2.23	ton/cy
Stone volume	2.69	cy/stone
Number of stones required	30,154	
Total weight of stones	180,921.47	
1,500	tons avg barge capacity	
121	Number of barges to deliver all stones	

Truck capacity	12	cy
number of stones per truck	4	
Number of truck trips	7,538	

tracked excavator
bulldozer

Material deliveries via barge

Material	Source Location	One way distance (mi)	Total Round Trip Time (hrs)	Total # of trips	Computed Total time (hrs)	Total mi traveled
Stone	Norfolk	100	20	121	2,412	24,123

Deliveries	**Engine HP**	**# Engines**	**Load Factor**	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM10** g/hp-hr	**PM2.5** g/hp-hr	**N2O** g/hp-hr	**CH4** g/hp-hr	**CO2** g/hp-hr	**BSFC** lb/hp-hr	**Formaldehyde** g/hp-hr	**Benzene** g/hp-hr
Tugboat - propulsion	2000	2	0.68	0.22	0.69	4.21	0.00	0.11	0.11	0.02	0.00	507	0.350	0.01	0.00
				VOC Ton	**CO** Ton	**NOx** Ton	**SO2** Ton	**PM10** Ton	**PM2.5** Ton	**N2O** Ton	**CH4** Ton	**CO2** Ton		**Formaldehyde** Ton	**Benzene** Ton
		Tugboat Annual Emissions		1.59	4.96	30.43	0.03	0.80	0.77	0.18	0.01	3,665		0.07	0.01
											CO2e in metric tons/year			**3,368**	

Equipment Usage	Hours
Crawler Crane	3,840
Dozer	3,840
Excavator	3,840

Assuming 120 days construction, 2 8 hour shifts, and 2 units of each equipment

Equipment Emissions

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CH4 g/hp-hr	CO2 g/hp-hr	Formaldehyde g/hp-hr	Benzene g/hp-hr
Crawler Crane	3,840	150	1	0.0414138	0.1753584	0.8636454	0.0014719	0.040731732	0.0395098	3.58E-03	530.93	0.00	0.01
Dozer	3,840	275	0.58	0.0195561	0.0883136	0.2930742	0.0014402	0.016561595	0.0160647	1.58E-03	536.77	0.00	0.00
Excavator	3,840	450	0.53	0.0319626	0.2032897	0.5487676	0.0014798	0.032563556	0.0315866	2.82E-03	536.74	0.00	0.01

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CH4 lb	CO2 lb	Formaldehyde lb	Benzene lb
Crawler Crane	53	223	1,097	2	52	50	5	674,206	2	12
Dozer	26	119	396	2	22	22	2	724,800	1	6
Excavator	65	410	1,108	3	66	64	6	1,083,718	3	16
Tons/year:	**0.1**	**0.4**	**1.3**	**0.0**	**0.1**	**0.1**	**0.0**	**1,241.4**	**0.00**	**0.02**
								CO2e in metric tons/year		**1,126**

Total Onsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	0.07	0.38	1.30	0.00	0.07	0.07	1,126	0.00	0.02

Total Offsite Emissions

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Tons per Year	1.59	4.96	30.43	0.03	0.80	0.77	3,368	0.07	0.01

Total Emissions (tons per year)

	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	Formaldehyde	Benzene
Seawall Extension	1.67	5.33	31.73	0.04	0.87	0.84	4,494	0.07	0.03

TAB H.

average passenger vehicle

	400 grams of CO_2 per mile		Source: https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle#driving
	0.88 lb of CO_2 per mile		
	CO_2e		
	Tons/yr	154,045,762	miles
Alt 1	67,877	13,280	cars driving 11,600 miles in a single year (annual mileage source: Virginia DMV)
		1,897	cars driving 11,600 miles per year (annual mileage source: Virginia DMV) for seven years
		145,889,506	miles
Alt 2	64,283	12,577	cars driving 11,600 miles per year (annual mileage source: Virginia DMV)
		87,179,015	miles
Alt 3	38,413	7,515	cars driving 11,600 miles per year (annual mileage source: Virginia DMV)

TAB I.

EQUIPMENT DATA AND EMISSION FACTORS

Construction			Emissions Factors									
		Load	VOC	CO	NOx	SO_2	PM10	PM2.5	CO_2	CH4	Formaldehyde	Benzene
Equipment	HP	Factor	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr
Dozer	275	0.58	0.02	0.09	0.29	1.44E-03	0.02	0.02	536.77	1.58E-03	0.001	0.00
Excavator	450	0.53	0.03	0.20	0.55	1.48E-03	0.03	0.03	536.74	2.82E-03	0.001	0.01
MOBILE CRANE	150	1	0.04	0.18	0.86	1.47E-03	0.04	0.04	530.93	3.58E-03	0.002	0.01
Pile Driver/Extractor	300	1	0.21	0.56	2.62	1.70E-03	0.12	0.11	530.44	0.01	0.009	0.05

Note: The MOVES model does not include emission factors for N2O for nonroad equipment. N2O for nonroad equipment is estimated using ratio N2O/CH4 ratio of 0.26/0.57 from EPA (2016), Table B-8.

Construction Trucks	Emissions Factors										
	VOC	CO	NOx	SO2	PM10	PM2.5	CO2	CH4	N2O	Formaldehyde	Benzene
	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle	g/hr-vehicle
Onsite trucks - Idle	5.23	21.99	34.17	0.02	2.54	2.34	5,727.82	0.27	0.08	3.88E-02	4.06E-01
	VOC	CO	NOx	SO2	PM10	PM2.5	CO2	CH4	N2O	Formaldehyde	Benzene
	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT
Onsite trucks - 10 MPH	0.85	4.48	7.34	0.01	0.99	0.46	1,701.05	0.04	0.01	4.52E-03	4.74E-02

Boat Equipment	Engine kW	Load	Emissions Factors											
			VOC	CO	NOx	SO_2	PM10	PM2.5	CO_2	CH4	N_2O	BSFC	Formaldehyde	Benzene
		Factor	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)	(g/kWh)
Work tug - propulsion	112	0.5	0.30	0.92	5.64	6.25E-03	0.15	0.14	679	2.68E-03	0.03	213	0.013	0.0014
Ocean Tug- propulsion	1118	0.68	0.30	0.92	5.64	6.25E-03	0.15	0.14	679	2.68E-03	0.03	213	0.013	0.0014
Derrick Barge	2500	0.68	0.30	0.92	5.64	6.25E-03	0.15	0.14	679	2.68E-03	0.03	213	0.013	0.0014
Work Barge	1000	0.68	0.30	0.92	5.64	6.25E-03	0.15	0.14	679	2.68E-03	0.03	213	0.013	0.0014
Trailing Suction Dredge - Propulsion	4000	0.68	0.30	0.92	5.64	6.25E-03	0.15	0.14	679	2.68E-03	0.03	213	0.013	0.0014
Trailing Suction Dredge - Pumps	2500	0.68	0.30	0.92	5.64	6.25E-03	0.15	0.14	679	2.68E-03	0.03	213	0.013	0.0014

Hazardous Air Pollutant (HAP) Speciation Profiles/Emission Factors from USEPA Port Emissions Inventory Guidance (2020), Appendix D.

Benzene = 0.004739 X VOC

Formaldehyde = 0.042696 X VOC

For Harborcraft:

SO2 Emission factor calculated based on equation 4.5 in EPA (2020), Port Emission Guidance

CO2 Emission factor calculated based on equation 4.4 in EPA (2020)

CH4 Emission factor calculated based on 4.5.4 in EPA (2020)

N2O Emission factor calculated based on equation 4.3 in EPA (2020)

For ocean going vessels:

CO2 Emission factor calculated based on equation 3.4 in EPA (2020)

PM2.5 calculated as 92% of PM10 as per 3.5.3 in EPA (2020)

Rail Movement of Materials

Locomotives - EPA Tier 1 engines assumed

	g/gal								
	VOC	CO	Nox	SO2	PM10	PM2.5	CO2	CH4	N20
Large Line Haul, Tier 1+	4.85	26.62	120.5	0.0939	3.042	2.951	10,150	0.8	0.26

diesel fuel density assumed at 3200 g/gal.

Sulfur content assumed at 15 ppm

Carbon content assumed at 87 % by mass

Emission data from EPA, 2020 National Emissions Inventory: 453.59 g/lb

Locomotive Component, Table 5. ERG 2022.

No EFs for formaldehyde or benzene

0.002 gal/ton-miles of freight transported from EPA 2021 SmartWay Rail Carrier Partner Tool: Technical Documentation.

Truck/Transit Emission Factors

Road Type	Vehicle Type	Speed (MPH)	Emission Factor Units	Maximum Emission Factor											
				VOC	CO	NOx	SO2	PM10	PM2.5	CO2	CH4	N2O	Total GHGs (CO2e)	Benzene	Formaldehyde
Highway	SUSH Truck	35	g/VMT	3.07E-01	1.74E+00	3.19E+00	3.31E-03	1.37E+00	3.33E-01	9.73E+02	1.46E-02	2.36E-03	9.74E+02	2.30E-03	2.41E-02
Sidestreets	SUSH Truck	15	g/VMT	6.07E-01	3.40E+00	5.80E+00	4.92E-03	4.37E+00	8.88E-01	1.45E+03	3.12E-02	5.52E-03	1.45E+03	4.52E-03	4.74E-02
Idle	SUSH Truck	0	g/hr	5.23E+00	2.20E+01	3.42E+01	1.95E-02	2.54E+00	2.34E+00	5.73E+03	2.70E-01	8.27E-02	5.76E+03	3.88E-02	4.06E-01

SUSH = Single Unit Short Haul

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Appendix D
Essential Fish Habitat Consultation Documents

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Final

NASA WFF Shoreline Protection Program Essential Fish Habitat Assessment

Prepared for:

National Aeronautics and Space Administration

Goddard Space Flight Center

Wallops Flight Facility

Wallops Island, VA

March 2026

In Cooperation with:
Bureau of Ocean Energy Management
U.S. Army Corps of Engineers

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulation
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFHA	Essential Fish Habitat Assessment
FMC	Fishery Management Council
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
ft	foot/feet
HAPC	Habitat Area of Particular Concern
HIF	Horizontal Integration Facility
MAB	Mid-Atlantic Bight
mi	mile(s)
MHW	mean high water
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
PEIS	Programmatic Environmental Impact Statement
ppt	parts per thousand
SAV	submerged aquatic vegetation
SERP	Shoreline Enhancement and Restoration Project
SPP	Shoreline Protection Program
SRIPP	Shoreline Restoration and Infrastructure Protection Program
ROD	Record of Decision
U.S.	United States
USACE	U.S. Army Corps of Engineers
VDOT	Virginia Department of Transportation
VSA MARS	Virginia Spaceport Authority Mid-Atlantic Regional Spaceport
WFF	Wallops Flight Facility
yd^3	cubic yard(s)

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1.0 BACKGROUND AND INITIAL CONSIDERATIONS

1.1 INTRODUCTION

This correspondence serves as the National Aeronautics and Space Administration's (NASA's) notification to the National Oceanographic and Atmospheric Administration (NOAA) Fisheries of its proposed Shoreline Protection Program at Wallops Flight Facility (WFF), Wallops Island, Virginia. This project tiers to the 50-year Shoreline Restoration and Infrastructure Protection Program (SRIPP). The goal of the SRIPP is to reduce direct damage to Wallops Island's infrastructure, allowing WFF to continue its mission of supporting aerospace programs.

Under Section 404 of the Clean Water Act, the United States (U.S.) Army Corps of Engineers (USACE) Regulatory Program has jurisdiction over the disposal of dredged and fill material in Waters of the U.S. Similarly, under Section 10 of the Rivers and Harbors Act of 1899, the USACE has jurisdiction over the placement of structures and work conducted in navigable waters of the U.S. and would issue a permit to enable the proposed project. Additionally, the USACE Norfolk District is overseeing project design, construction, and monitoring on NASA's behalf. The U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) has jurisdiction over mineral resources on the Federal Outer Continental Shelf and would enter into a negotiated agreement with NASA and USACE pursuant to section 8(k)(2)(d) of the Outer Continental Shelf Lands Act. Therefore, both BOEM and USACE are serving as cooperating agencies on this project.

To this end, NASA has assumed the role of Lead Federal Agency and has prepared this Essential Fish Habitat Assessment (EFHA) as an attachment to the *2025 Draft Wallops Flight Facility (WFF) Shoreline Protection Program (SPP) Environmental Assessment (EA)* to evaluate the potential environmental impacts of both enhancing and protecting the shoreline on Wallops Island. Both BOEM and USACE are participating in NASA's Essential Fish Habitat (EFH) consultation. The effects of their actions are considered in all project documents, including this correspondence.

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976, federal agencies must consult with the U.S. Department of Commerce's National Oceanic and NOAA Fisheries for activities that may adversely influence EFH that is designated in a Federal Fisheries Management Plan. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Both the offshore borrow area and the nearshore renourishment and breakwater locations are designated EFH for 27 managed species of all life stages ([variously] eggs, larvae, juveniles, adults, and spawning adults). The Project Area coincides with no Habitat Area of Particular Concern (HAPC). Therefore, the EFH consultation requirement applies to the Proposed Action.

This EFHA is part of the tiered consultations from the *2010 Final Shoreline Restoration and Infrastructure Protection Program (SRIPP) Final Programmatic Environmental Impact Statement* (*PEIS)* (NASA 2010), with information and project components as presented in the *2013 Final Wallops Island Post-Hurricane Sandy Shoreline Repair EA* (NASA 2013), the *2019 Final Shoreline Enhancement and Restoration Project (SERP) EA* (NASA 2019), and the *2018 NASA WFF Shoreline Enhancement and Restoration Project Essential Fish Habitat Assessment* (NASA 2018). The *2010 Final SRIPP PEIS* presented a complete description of all project-related resource areas with relevant, updated descriptions and information presented in the Post-Hurricane Sandy EA. These documents are incorporated by reference with new information and analysis provided, as appropriate. Elements of three Action

Alternatives that would be relevant to EFH and managed species are summarized in the following abridged sections. Full details are in the *2025 Draft WFF SPP EA*, incorporated by reference.

1.2 BACKGROUND

On December 13, 2010, NASA issued a Record of Decision (ROD) for *WFF SRIPP PEIS*, hereafter referred to as the *2010 Final SRIPP PEIS*. The U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM)[1] and the U.S. Army Corps of Engineers (USACE), Norfolk District were Cooperating Agencies. The primary goal of the SRIPP is to reduce direct damage to Wallops Island's infrastructure; however, its primary benefit is the continued use of the island to support the aerospace programs that are at the core of WFF's mission (NASA, 2010a). The *2010 Final SRIPP PEIS* analyzed three Action Alternatives including structural and non-structural options, varying beach berm widths, and multiple sources of fill material. In its ROD, NASA selected *Alternative 1: Full Beach Fill, Seawall Extension* and adopted a suite of mitigation and monitoring protocols to both reduce potential environmental impacts and track project performance. Implementing the initial phase of Alternative 1 entailed: 1) the placement along the Wallops Island shoreline of approximately 3.2 million cubic yards (yd^3) of sand material dredged from Unnamed Shoal A, an offshore sand ridge located approximately 11 miles northeast of Wallops Island on the Outer Continental Shelf (OCS) under BOEM jurisdiction; and 2) an initial 1,430-foot (ft) southerly extension of the Wallops Island rock seawall with future extensions completed as funds are available to a maximum length of 4,600 ft (Figure 1-1).

The *2010 Final SRIPP PEIS* ROD stated that fill material for future renourishment cycles could be taken from either OCS Unnamed Shoal A, OCS Unnamed Shoal B (another offshore sand ridge located approximately 13 miles northeast of Wallops Island), or north Wallops Island beach. The initial nourishment, plus up to nine renourishment cycles at approximately five-year intervals over the 50-year life of the SRIPP, would be anticipated (NASA 2010).

The initial beach renourishment (3.2 million cubic yards) was completed in August 2012. A second renourishment was required shortly thereafter when, in October 2012, Hurricane Sandy made landfall. Monitoring surveys following the storm event identified the need to repair a section of the seawall and the southern two-thirds of the recently nourished beach. NASA signed a Finding of No Significant Impact (FONSI) on June 6, 2013, for the *Wallops Island Post-Hurricane Sandy Shoreline Repair Final EA* (NASA 2013). Repairs to the seawall and second beach renourishment of 650,000 cubic yards of sand were completed in September 2014[2] (Figure 1-2). Subsequent storms in 2015 (Hurricane Joaquin), in 2016 (Winter Storm Jonas), and in 2018 (Winter Storm Riley) resulted in a reduction of over a million cubic yards of sand in the southern portion of the island as compared to volumes present after the 2014 shoreline repair (USACE 2018a).

[1] BOEM adopted the 2010 Final SRIPP PEIS ROD and signed its own ROD on March 2, 2011. The BOEM ROD authorized the use of OCS sand for the initial beach fill and stated each subsequent beach fill proposal would require a new negotiated contract and an updated environmental analysis (BOEM 2011).

[2] BOEM, as a cooperating agency, signed a FONSI on July 5, 2013, supporting the decision to issue a negotiated agreement for use of OCS sand supporting nourishment in 2014 (BOEM 2013).

Figure 1-1 2012 Wallops Shoreline Protection Project

Figure 1-2 2014 Post-Hurricane Sandy Replenishment

In 2018, NASA requested the USACE Norfolk District Hydraulics and Hydrology Section to evaluate the effectiveness of constructing a breakwater or series of breakwaters along the Wallops Island shoreline to reduce the intensity of wave action and the rate of sediment transport since previous renourishments provided only temporary protection. The USACE modeled seven alternative configurations with varying placement, size, and number of breakwaters and projected how each alternative would affect shoreline stabilization and sediment transport. The analysis employed numerical modeling to determine the size and placement of breakwater(s) that would address the erosion issues. Modeling indicated the placement of detached parallel breakwater structures approximately 200 feet (ft) offshore from the mean high water (MHW) line would be most effective (USACE 2018b).

On July 16, 2019, NASA signed a FONSI for the *Final SERP EA* (NASA 2019) to implement a third renourishment[3]. The project placed approximately 1.1 million cubic yards of sand sourced from the north Wallops Island beach. Prior to renourishment, a total of five breakwaters were constructed approximately 200 ft offshore from the MHW line of the Wallops Island shoreline infrastructure protection area. Two breakwaters were constructed in front of the Horizontal Integration Facility (HIF; Building X-079) and three breakwaters were constructed in front of Launch Pad 0-B (Figures 1-3 and 1-4).

[3] BOEM, as a cooperating agency, signed a FONSI on February 6, 2019, supporting the decision to issue a negotiated agreement for use of OCS sand supporting nourishment in 2020. However, sand was transferred from North Wallops Island Beach, and OCS sand was never required.

Figure 1-3 2019 Pre-Replenishment versus Post 2020/2021 Beach Replenishment

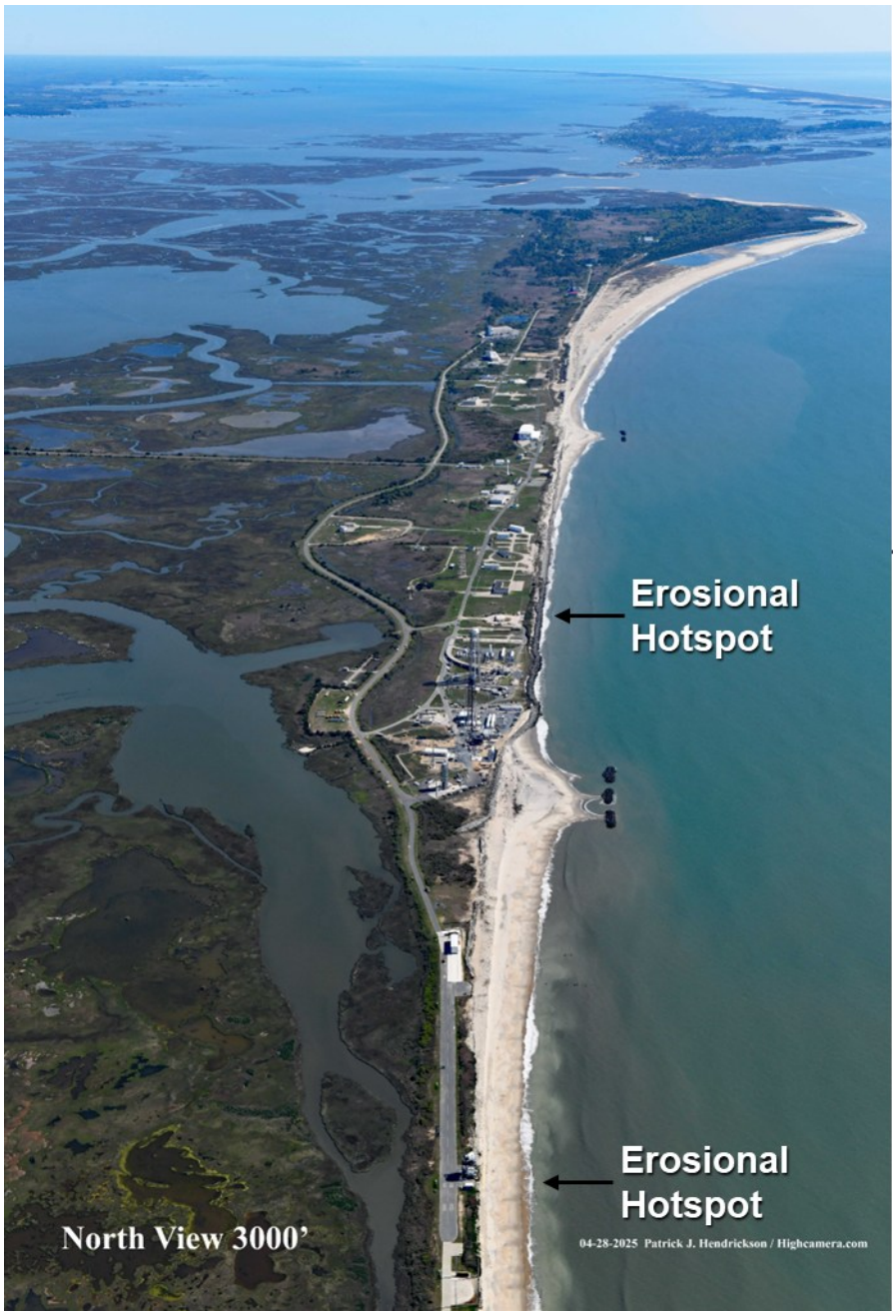

Figure 1-4 2025 Current Condition

1.3 REGULATORY CONTEXT

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 and the 1996 Sustainable Fisheries Act defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." *Waters* consist of aquatic areas and their associated physical, chemical, and biological properties that are currently utilized by fishes and may include areas historically used by fishes. *Substrate* is defined as sediment, hardbottom, structures beneath the waters, and any associated biological communities. *Necessary* means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. *Spawning, breeding, feeding*, or *growth to*

maturity includes all habitat types used by a species throughout its life cycle. Only species managed under a Federal Fishery Management Plan (FMP) are protected under 50 Code of Federal Regulations (CFR) 600. The act requires federal agencies to consult on activities that may adversely influence EFH designated in the FMPs.

The purpose of this assessment is to describe and evaluate activities that may have direct (e.g., physical disruption) or indirect (e.g., loss of prey species) effects on EFH and may be site-specific or habitat-wide. Potential adverse impacts are evaluated individually and cumulatively.

1.4 ESSENTIAL FISH HABITAT CONSULTATION HISTORY

Previous EFH consultations concurred that beach restoration and breakwater construction would not substantially adversely affect EFH. With implementation of NOAA Fisheries' Conservation Recommendations, effects to EFH were expected to be localized and short-term. The most recent SERP EFHA consultation from September 2018, analyzed the effects from three different beach restoration Action Alternatives for up to 21 managed species of all life stages (eggs, larvae, juveniles, adults, and spawning adults), 11 EFH designations, and no HAPCs (nearest HAPC is approximately 60 miles (mi) north and south, at Delaware Bay and the Chesapeake Bay). This Assessment focuses on EFH that may occur within the proposed project areas, those resources and habitat that have meaningfully changed since the 2018 analysis. The previous conclusions and regulatory findings are carried forward with new information and analysis provided as appropriate.

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2.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to ensure the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

The initial cycle of the 50-year SRIPP project was completed in August 2012, the second cycle that repaired the damaging effects from Hurricane Sandy was completed in September 2014, and the third and most recent cycle was completed in 2021. The current Proposed Action is to perform additional beach renourishment, breakwater construction, and/or seawall repair and extension taking into consideration new information. This Action is needed to maintain the function of the Wallops Island beach berm and dune system, which is vital to protecting critical NASA, Navy, Air Force, and Virginia Spaceport Authority Mid-Atlantic Regional Spaceport (VSA MARS) assets.

Consistent with the Action Alternatives described in detail in the *2010 Final SRIPP PEIS* (NASA 2010), reexamined in the *2013 Final Post-Hurricane Sandy EA* (NASA 2013), and implemented following completion of the *2019 Final Shoreline Enhancement and Restoration Project EA* (NASA 2019), NASA's Proposed Action would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The Proposed Action could involve a combination of the following (**Figure 2-1**):

- sand renourishment within an approximate 15,000-ft section of shoreline from the south property line on Wallops Island north to the location of the fire station;
- construction of up to six breakwaters in the nearshore area between the existing breakwaters; as well as
- repairs and extension of the existing seawall.

Shoreline stabilization activities would occur in phases depending on a number of factors, including infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction, or both, could occur in another area.

Elements of three Action Alternatives that would be relevant to EFH and managed species are summarized in the following abridged sections. Full details are in the *2025 Draft WFF SPP EA*, incorporated by reference. Beach and breakwater fill designs may be found in Appendix A.

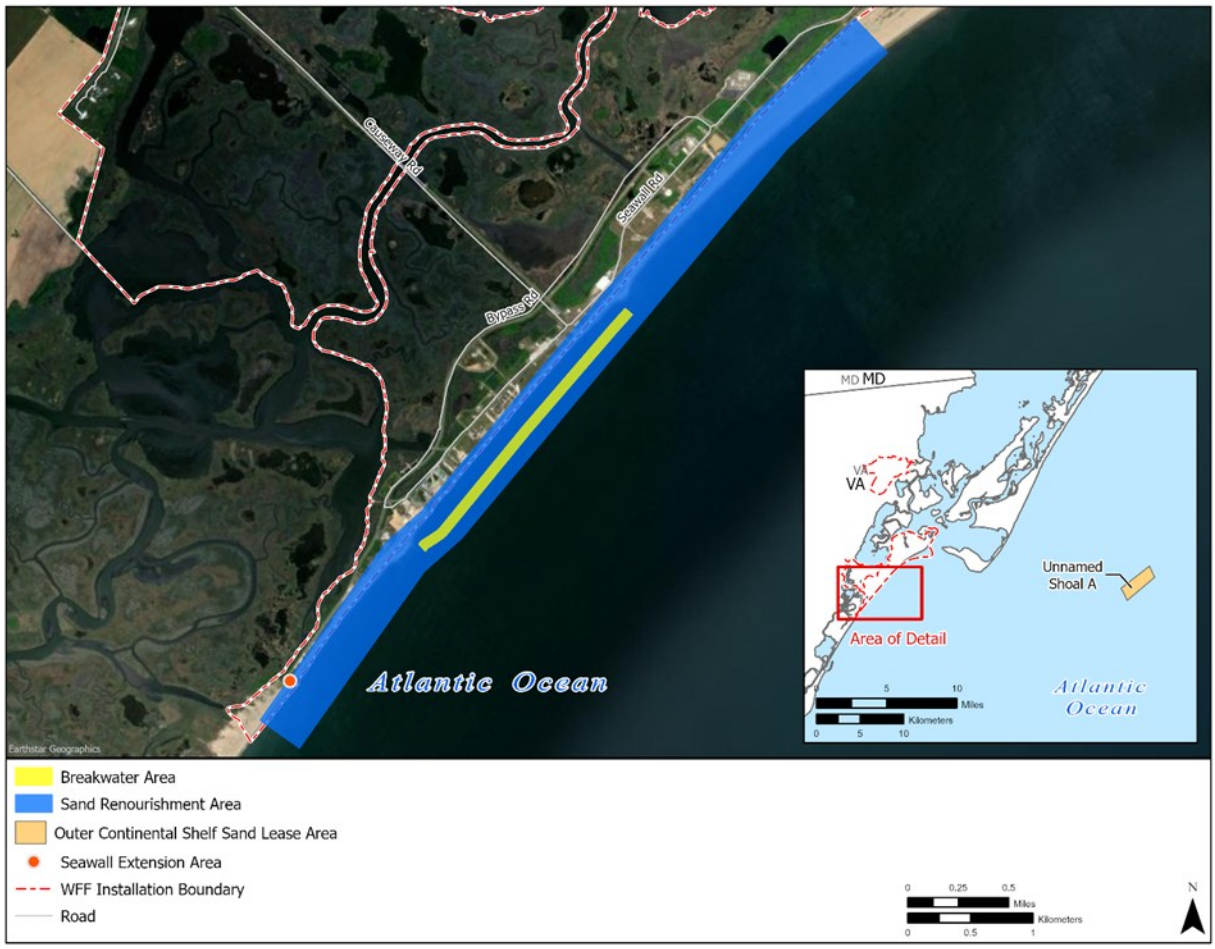

Figure 2-1 Project Area and Components

Alternative 1: Beach Renourishment and Breakwater Construction

Alternative 1 would renourish the beach along the Wallops Island shoreline infrastructure protection area using sand material sourced from Unnamed Shoal A. Beach renourishment would involve employing the steps for preparing, executing, and completing a renourishment cycle as described in the *2025 Draft WFF SPP EA*. All dredging and equipment placement would take place in areas previously surveyed.

Under Alternative 1, approximately 3 million cubic yards of sand material from Unnamed Shoal A may be placed in the shoreline areas, over the next seven years. Because of overflow from the hopper dredge at the borrow site during dredging and losses during discharge and placement, a larger volume of material would need to be dredged to meet the targeted fill volume. Sediment losses during dredging and placement operations are assumed to be up to 50 percent. Using this estimate, the dredged volume for the proposed renourishment would be approximately 4.5 million cubic yards of sand, and it is anticipated that 2 to 3 million cubic yards would be moved per renourishment event. The dredging and beach fill portion of the project would take approximately 3 months. Pre- and post-dredging surveys and regular beach profile monitoring of the project site would be conducted, and periodic monitoring of the previously constructed breakwaters would continue to be conducted, as funding allows.

Alternative 1 would also involve constructing up to six new detached breakwaters and repair and extension of the seawall. The breakwaters would be positioned offshore along the shoreline infrastructure protection area.

Alternative 2: Beach Renourishment

Alternative 2 would renourish the beach along the Wallops Island shoreline infrastructure protection area using material from Unnamed Shoal A. This alternative would involve up to 3 million cubic yards of sand material from Unnamed Shoal A being placed in the shoreline areas over the next seven years. Because of overflow from the hopper dredge at the borrow site during dredging and losses during discharge and placement, a larger volume of material would need to be dredged to meet the targeted fill volume. Sediment losses during dredging and placement operations are assumed to be up to 50 percent. Using this estimate, the dredged volume for the proposed renourishment under Alternative 2 would be approximately 6 million cubic yards of sand. The dredging and beach fill portion of the project would take approximately three months. Pre- and post-dredging surveys and regular beach profile monitoring of the project site would be conducted, and periodic monitoring of the previously constructed breakwaters would continue to be conducted as funding allows. Alternative 2 would also involve repair and extension of the seawall.

Alternative 3: Breakwater Construction

Alternative 3 would involve the construction of up to six new breakwaters, over the next seven years, without beach renourishment. The breakwaters would be positioned offshore along the shoreline infrastructure protection area between the existing sets of breakwaters. Periodic monitoring of the constructed breakwaters would be conducted as funding allows. Alternative 3 would also involve repair and extension of the seawall.

No Action Alternative

Under the No Action Alternative for the *2025 Draft SPP Tiered EA*, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and erosion; or repair or extend the existing seawall.

2.1 ELEMENTS OF THE ALTERNATIVES RELEVANT TO ESSENTIAL FISH HABITAT

2.1.1 RENOURISHMENT PROCESSES

Beach renourishment-related stressors imposed on EFH and managed species include nearshore turbidity and water quality, and physical strike and disturbance. All other stressors imposed by renourishment processes are not relevant because their nature and intensity is discountable, stressor and receptor are not co-located, and EFH and managed species have little-to-no meaningful susceptibilities in this context (i.e., artificial lighting, noise, ingestion, entanglement, electromagnetic, and chemical stressors). These other stressors were discounted in previous SRIPP and Post-Sandy EFHAs and were discounted or determined to be negligible in similar recent EFH consultations in the region.

Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post-dredging surveys) under the Proposed Action are described in **Section 2.2** in the *2025 WFF SPP EA* and are hereby incorporated by reference. These processes would be consistent with those described in detail in previous National Environmental Policy Act (NEPA) analyses (NASA 2010; NASA 2013; NASA

2019). For this Proposed Action, sand material for beach renourishment would come from OCS Unnamed Shoal A. All equipment placement and laydown areas would be in areas previously surveyed.

Beach Fill Mobilization

The renourishment process would begin with the dredge contractor transporting equipment and materials to the project site. Offshore equipment (**Figure 2-2**) would include several miles of discharge pipe, pump-out buoys, and multiple barges, tugboats, derricks, and smaller crew transportation vessels. It is expected that the discharge lines would be assembled inside the protected waters of Chincoteague Inlet, rafted together, and then positioned by mechanical means at their ultimate placement site, as weather conditions allow. Onshore, it is expected that sections of the discharge lines would be trucked in, staged, and placed using a front-end loader or crane. Other onshore support equipment would be trucked in and may include multiple bulldozers, several all-terrain vehicles (ATVs), an office trailer, mobile generators, construction site lighting, and mobile fuel tanks. The mobilization is expected to take 30 to 45 days. Laydown areas would be located on previously cleared areas and would not involve additional disturbance.

Figure 2-2 Beach Fill Offshore Equipment

Once the dredge hopper is filled, the dredge would transport the material to a pump-out station that would be placed at a water depth of approximately 30 ft, approximately two miles offshore of the placement area. The pathway from Unnamed Shoal A to the pump-out buoy is not a straight line, but a dogleg shape with a turning point, for the purpose of avoiding Chincoteague Shoal and Blackfish Bank. The distance from the turning point to the pump-out buoy is approximately 8 miles. The one-way distance from Unnamed Shoal A to the theoretical pump-out buoy is approximately 14 miles. It is estimated that the pump-out station would be moved up to 10 times to accommodate transit by the dredge. Booster pumps may be needed to aid the offloading of sand from the pump-out buoy to the shoreline.

Dredging and Sand Placement Process

Upon receipt of all necessary authorizations, the USACE (on NASA's behalf) would contract for the dredging and placement of sand. Munitions and explosives of concern (MEC) screens would be added to the dragheads of trailing hopper dredges during use. The dredging process would be cyclical in nature, with the vessel transiting to the borrow site, lowering its drag arms, filling its hopper, and returning to a

discharge site. The dredge would connect to the floating end of the submerged pipeline offshore of the beach renourishment area. The sand/water slurry would be pumped from the dredge site through this pipeline to the beach (**Figure 2-3**). Up to several miles of submerged steel pipeline would be temporarily placed on the seafloor in areas previously cleared for cultural resources and/or on hardbottom. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019a).

Dredging would be conducted in a manner consistent with the recommendations from published literature examining the effects of dredging of offshore shoals in the Mid-Atlantic as presented in the *2010 Final SRIPP PEIS* (CSA International Inc. et al. 2009; Dibajnia and Nairn 2010). More specifically, NASA would at a minimum:

- Dredge offshore sand from Unnamed Shoal A sub-area A-1 (an accretional area);
- Dredge over a large area and not create deep pits;
- Require that dredge cut depth not be excessive;
- Require that dredging not occur over the entire length of the shoal;
- Require MEC screening at the drag head;
- Require a lookout bridge watch be present on the dredge at all times from April 1–November 30; and
- If a listed whale is spotted within 1 kilometer (km) (0.62 mile) of the dredge, stop dredging until the whale is farther than 1 km from the dredge.

Figure 2-3 Dredging and Sand Placement Process with Trailing Suction Hopper (left) and Bulldozers Grading Discharged Sand (right)

Sand would be placed onshore along 15,000 ft of beach extending from just north of the southern property line to the north near the fire station. The tidal cycle would influence the location on the beach within which the equipment would work for a given dredge load. During low tide, the equipment would likely concentrate on the intertidal and sub-tidal zones, whereas, during high tide, work would be focused on the upper beach berm and dune. After each section of beach is confirmed to meet design criteria, the process would continue in the longshore direction, with sections of discharge pipe added as it progressed. At the conclusion of dredging and beach fill, the construction contractor would begin the demobilization phase of the project, the largest task of which would be the disassembly, staging, and loading of discharge piping for transport off-site.

2.1.2 BREAKWATER CONSTRUCTION

Up to six breakwaters would be constructed nearshore between the two existing sets of breakwaters. Breakwaters would vary in height and width depending on the elevation of the sea bottom. Each would cover between 16,000 and 18,000 square ft of bottom, for a total of up to 108,000 square ft (~2.5 acres). Breakwaters could be placed in sets of 2-3 or individually, approximately 200 ft offshore (USACE 2025). Though construction materials may vary over the life of this project, previously at Wallops Island breakwaters have been constructed with a 9-foot layer of Type II Armor Stone, a center core of Virginia Department of Transportation (VDOT) Class III stone. Breakwaters may be placed on underlying 12-inch marine filter mattresses and/or a layer of geotextile fabric.

The specific size, number, and placement of breakwaters would be a function of available funding, local conditions, and modeling by the USACE to determine maximum effectiveness and minimizing impacts to sediment transport and hydrodynamics in the project vicinity.

Breakwater construction via barge would be consistent with that evaluated in the *2010 Final SRIPP PEIS* and *2019 Final Shoreline Enhancement and Restoration Project EA*. In 2020, fall and winter storm and surf conditions created a potential risk to personnel and equipment and the project schedule. To mitigate the risks, several breakwaters were constructed using temporary bulkheads. Under this Proposed Action, breakwater construction may include the use of barges, temporary trestle system, or temporary bulkheads. Since construction by temporary bulkhead would be the most impactful method of installing the breakwaters, this construction method has been used to analyze effects. If breakwaters are constructed by barge or temporary trestle, it is anticipated that any effects would be of a lesser magnitude than temporary bulkheads. Construction of each breakwater is estimated to take approximately two months. The materials and equipment would be transported by truck to and from the island via State Road 803 to South Bypass Road to a staging area. The staging area location and size would be the same as was established in 2021 and used during construction of the temporary bulkhead.

Build Breakwaters by Barge

The rocks and other materials for constructing each breakwater would be transported to the breakwater construction area by rail, offloaded, and then barged to the handling or placement site offshore of Wallops Island. Placement would occur in the water using a barge and heavy lifting equipment. These breakwaters would be permanent structures as removal would be impractical and cost prohibitive (NASA 2010).

Build Breakwaters Using Temporary Bulkheads

The equipment would be transported via truck from contractor staging sites and delivered through the Wallops Island gate into the staging area (as described above). The existing access would be maintained with gravel to minimize any effect to the NASA Erosion and Sediment Control plan. The installation of temporary bulkhead structures would be through using a steel sheet pile. Each temporary bulkhead would be 130 ft long by 30 ft wide and use approximately 1,000 cubic yards of temporary sand (either clean compatible sand from an offsite source or from the beach fill template) per access. All equipment and remaining materials after installation would be trucked off-site to the contractor staging area.

Build Breakwaters Using Temporary Trestle System

The breakwater materials and construction equipment would be transported by truck to and from the island via State Road 803 to South Bypass Road to a staging area (as described above). The process to build each breakwater using a temporary trestle system would include each of the steps listed above, with

the exception of creating a bridge (i.e., trestle) at each breakwater location. Instead, a series of steel pilings would be installed and beams placed across the top of the piles to form temporary piers. Once the piers were constructed, beams would be placed and span pier to pier with the beam placement aligning with the chosen crane/lifting equipment's track or wheelbase. The system would be designed as 30 ft to 40 ft wide with decking material comprised of crane mats and would be placed next to the breakwater location.

Following construction of the last breakwater, the steel pilings would be removed using vibratory hammer and crane and placed in the staging area prior to transport off-site. Regular beach profile monitoring of the project site and biannual monitoring of the constructed breakwaters would be conducted.

2.1.3 ELEMENTS COMMON TO ALL ALTERNATIVES

Seawall Repair and Extension

The existing rock seawall is located along 15,900 ft of the Wallops Island shoreline. Construction of this seawall began in 1992 and continues to protect WFF infrastructure within the eroding portion of the shoreline from damage due to storms and large waves. The wall has prevented overwash and storm damage, but erosion of the shoreline seaward of the wall has continued, resulting in an increased risk of damage to the seawall and the missions and infrastructure it protects. The SRIPP analyzed potential effects from repairing and extending the seawall to a maximum length of 4,600 ft south of its southernmost point (NASA 2010). During the first SRIPP cycle, the seawall was extended approximately 1,430 ft south with the premise that the remaining 3,170 ft extension would be implemented with future funding. The seawall extension would consist of the placement of rocks weighing approximately 5 to 7 tons on a 1 to 1.5 slope. The top of the seawall would be approximately 14 ft above the normal high-tide water level after completion, depending on the extent of existing shoreline retreat at that time. The seawall may be repaired at any location.

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3.0 DESIGNATED EFH AND MANAGED SPECIES

EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Both the offshore borrow area and the nearshore renourishment and breakwater locations are within the vicinity of designated EFH for multiple life stages of managed fish species; therefore, the EFH consultation requirement applies to the Proposed Action.

3.1 DESIGNATED ESSENTIAL FISH HABITAT

The proposed project area includes a variety of EFH habitat types including (but not limited to) pelagic and epibenthic habitats, inshore estuaries, the ocean floor, and unconsolidated sand and shell substrates of the intertidal zone. NOAA Fisheries provides an interactive, online EFH Mapper tool for viewing officially designated habitats that the agency deems necessary for managed fish species to breed, feed, and grow to maturity. It displays spatial representations of fish species, their life stages, and important habitats, and is used to identify EFH that may potentially be affected by in-water activities. Users can input a project area in the mapper to discover which managed fish species spawn, grow, or live there, and the tool generates a report with supporting documentation. **Table 3-1** presents the EFH designations for 27 species identified by the NOAA Fisheries EFH Mapper query within the project area, which encompasses the shoreline and extends seaward to Unnamed Shoal A (located at 37.8477839°N, 75.2102609°W).

Table 3-1 Essential Fish Habitat and Managed Species in the Project Area

Species Name	Habitat	Life Stage
Atlantic butterfish (*Peprilus triacanthus*)	Sandy, muddy substrates	A, J, E
Atlantic herring (*Clupea harengus*)	Pelagic waters, bottom habitats	A, J
Atlantic surfclam (*Spisula solidissima*)	Medium to fine-grained sand 30–80 feet deep	A, J
Black sea bass (*Centropristus striata*)	Structured habitats (natural and man-made) such as shipwrecks, submerged aquatic vegetation, etc.	A, J, L
Bluefish (*Pomatomus saltatrix*)	Estuarine and nearshore waters	A, J, L, E
Clearnose skate (*Raja eglanteria*)	Soft bottoms along the continental shelf	A, J
Longfin inshore squid (*Doryteuthis pealeii*)	Continental shelf waters; muddy and sandy bottoms	E
Monkfish (*Lophius americanus*)	Sand, mud, and shell habitats	E, L
Red hake (*Urophycis chuss*)	Sandy sediments for juveniles; muddy substrates for adults	A, J, L, E
Scup (*Stenotomus chrysops*)	Smooth and rocky bottoms; around piers, rocks, and other underwater infrastructure	A, J
Spiny dogfish (*Squalus acanthias*)	Bottom dwellers; inshore and estuaries	

Species Name	Habitat	Life Stage
Summer flounder (*Paralichthys dentatus*)	Sandy habitats, estuaries	
Windowpane flounder (*Scopthalmus aquosus*)	Estuaries and nearshore waters	
Winter skate (*Leucoraja ocellata*)	Sandy and gravelly bottoms	
Witch flounder (*Glyptocephalus cynoglossus*)	Sea surface temperatures below 55°F, over deep waters with high salinity	
Albacore tuna (*Thunnus alalunga*)	Subtropical or tropical waters; often found near surface or around floating objects	
Atlantic angel shark (*Squatina dumerili*)	Bottom habitats in coastal waters	
Atlantic sharpnose shark (Atlantic stock) (*Rhizoprionodon terraenovae*)	Estuaries, sandy beaches, deep offshore waters	
Blacktip shark (Atlantic stock) (*Carcharhinus limbatus*)	Coastal waters worldwide	
Common thresher shark (*Alopias vulpinus*)	Along continental shelf, temperate and tropical waters	
Dusky shark (*Charcharhinus obscurus*)	Shallow inshore waters to beyond the continental shelf; feeds near bottom	
Sand tiger shark (*Odontaspis taurus*)	Shallow bays, reefs and wrecks	
Sandbar shark (*Charcharhinus plumbeus*)	Bottom dwellers; deep ocean banks and sandbars	
Skipjack Tuna (*Katsuwonus pelamis*)	Open ocean, at depths during the day	
Smooth Dogfish (*Mustelus canis*)	Coastal and estuarine waters along continental shelf	
Tiger shark (*Galeocerdo cuvier*)	Coastal and pelagic waters of continental shelf	
Yellowfin tuna (*Thunnus albacares*)	Open waters within epipelagic zone	

Legend: °F = degrees Fahrenheit ; A = Adult; EFH = Essential Fish Habitat; J = Juvenile; N = Neonate; E = Eggs; L = Larvae

Source: NOAA Fisheries 2025a

3.2 MANAGED SPECIES

Most species found in federal waters are managed by regional Fishery Management Councils (FMC) through the development and implementation of an FMP. Approximately 27 managed species have designated EFH in the vicinity of the proposed action area (NOAA Fisheries 2025a). EFH designations are mapped by NOAA Fisheries using 10 x 10-minute latitude-longitude blocks, and the proposed action area intersects several of these blocks as it extends linearly along the shoreline. For this assessment, the list of managed species was compiled by querying EFH blocks that overlap the project footprint, as well as immediately adjacent blocks (extending approximately one mile to the north, south, and offshore) to ensure comprehensive coverage under the Alternatives.

Species management policies and habitat designations are continuously refined by the FMCs in coordination with NOAA Fisheries and may be updated over time. NOAA Fisheries reviews EFH designations for managed species based on a regular basis through updates to managed species FMPs that occur every five years based on new and best available information. For example, the *2025 EFH Framework Action* is currently in process and will update EFH text and map designations for all life history stages of Atlantic cod, Atlantic herring, monkfish, and skates (NEFMC 2025). Highly Migratory Species (HMS) such as Atlantic tunas, swordfish, sharks, and billfish are different in that they are found throughout the Atlantic Ocean and must be managed both domestically and internationally. As a result, NOAA Fisheries has primary authority for developing and implementing an Atlantic HMS FMP. The *Consolidated Atlantic HMS FMP* was originally finalized in 2006 and has undergone multiple species management updates and EFH amendments since then (NOAA Fisheries 2006). Additional life history information for the species described below can be found in the *Consolidated Atlantic HMS FMP* and its Amendments, or other federal and regional FMPs.

HAPCs are discrete subsets of EFH identified by the Mid-Atlantic and New England FMC as areas that are ecologically important, sensitive to disturbance, exposed to development pressures, or are rare in occurrence. While HAPC designations do not create additional regulatory requirements beyond those already applicable to EFH, they highlight habitats of elevated conservation concern and focus management attention on areas most in need of protection. In the vicinity of Wallop's Island, VA, HAPCs include submerged aquatic vegetation (SAV) beds within estuarine and nearshore environments that function as crucial nursery habitat for summer flounder *(Paralichthys denatus*). These habitats, when present in estuarine and high-salinity lagoonal systems, such as Chincoteague Bay, provide important cover and foraging habitat for juvenile fish (NOAA Fisheries 2025b). However, no SAV, or other HAPCs, are within the project area.

3.2.1 ALBACORE TUNA (*THUNNUS ALALUNGA*)

3.2.1.1 Essential Fish Habitat for Albacore Tuna

Designated EFH for the juvenile life stage of albacore tuna can be found within the vicinity of the proposed project area. Albacore tuna are highly migratory and are managed under the *Consolidated Atlantic HMS FMP* (NOAA Fisheries 2017). Within the region, designated EFH for juveniles consists of offshore pelagic habitats of the Atlantic Ocean from the outer edge of the U.S. Exclusive Economic Zone (EEZ) through Georges Bank to pelagic habitats south of Cape Cod, throughout the region down to Cape Hatteras, North Carolina (NOAA Fisheries 2017). The central Atlantic is the wintering area for albacore tuna, and the feeding migration of juveniles (up to age five) to the productive waters in the northeastern Atlantic occurs in the summer while adults make the spawning migration to tropical waters. In the spring and summer, albacore spawn in subtropical waters of the Atlantic. Females can have between 2 million and 3 million eggs per spawning season. Similarly sized albacore travel together in schools that can be up to 19 miles wide. Juveniles prefer warmer surface waters, and adults like cooler, deeper waters (NMFS 2025c). This HMS would be expected to vacate any areas of temporary higher turbidity and has a low probability of occurrence within the area potentially affected under the three Alternatives.

3.2.1.2 Background

Albacore tuna are found in tropical and warm temperate waters in the Atlantic Ocean from Nova Scotia to northern Argentina and can travel long distances. Schools of albacore also sometimes include other tuna species such as skipjack, yellowfin, and bluefin. They are a temperate (cooler water) species but spawn in

warmer tropical waters (NOAA Fisheries 2025c). Albacore tuna are a metallic dark blue with dusky to silvery white coloration along the sides of the belly. They have long pectoral fins almost half the length of their bodies. Albacore tuna grow relatively fast and can reach approximately four ft and 88 pounds. In the Atlantic, they live up to 13 years and are able to reproduce by age five (NOAA Fisheries 2025c). Albacore constantly swim with their mouths open in order to breathe because they lack the structures needed to pump oxygen-rich water over their gills. They have unique biological characteristics such as torpedo-shaped bodies, smooth skin, and streamlined fins that enable them to swim at speeds over 50 miles per hour and cover vast areas during annual migrations. Albacore tuna feed near the top of the food chain, preying upon a variety of fish, crustaceans, and squid (NMFS 2025c).

3.2.2 ATLANTIC ANGEL SHARK (*SQUATINA DUMERILI*)

3.2.2.1 Essential Fish Habitat for Atlantic Angel Shark

Designated EFH for all life stages of the Atlantic angel shark can be found within the vicinity of the proposed project area. Atlantic angel sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP* (NOAA Fisheries 2017). Currently there is insufficient data to differentiate between each size class; therefore, EFH is the same for all life stages. EFH within the Atlantic Ocean includes continental shelf habitats from Cape May, New Jersey to Cape Lookout, North Carolina (NOAA Fisheries 2017). The Atlantic angel shark is an ovoviviparous species with eggs that develop in enclosed capsules and hatch in the uteri. Eggs are pelagic, and the litter generally consists of approximately 16 pups which are born in the spring and summer in depths of 60-90 ft (Florida Museum 2025b). This shark species matures at two years and is ovoviviparous, meaning that the female produces eggs, but they remain inside her body until they hatch, so that "live" birth occurs. This HMS would be expected to vacate any areas of temporary higher turbidity or bottom disturbance and has a low probability of occurrence within the area potentially affected under the three Alternatives.

3.2.2.2 Background

The Atlantic angel shark is a flattened shark that resembles a ray. It is a bottom-dwelling species found in coastal waters of the Atlantic, generally at depths between 131 and 820 ft, throughout tropical and temperate waters (VIMS 2025a). The angel shark is highly migratory, moving north during the summer and wintering in warmer southern waters (Florida Museum 2025b). These small sharks look similar to skates and can grow up to four ft long. Its small, flattened body with extended pelvic fins and sandy-brown or gray color cause the shark to be frequently mistaken for a ray (Florida Museum 2025b). The angel shark preys on demersal fish like flounder and skate, mollusks, crustaceans, and stingrays. This species is considered a bottom-dwelling species, often buried in sand or mud at the ocean floor.

3.2.3 ATLANTIC BUTTERFISH (*PEPRILUS TRIACANTHUS*)

3.2.3.1 Essential Fish Habitat for Atlantic Butterfish

Designated EFH for juvenile and adult Atlantic butterfish can be found within the vicinity of the proposed project area and is defined in Amendment 11 to the *Atlantic Mackerel, Squid, and Butterfish FMP*. EFH for both of these life stages consists of pelagic habitats in inshore estuaries and embayments from Massachusetts Bay to Pamlico Sound, North Carolina, in inshore waters of the Gulf of Maine and the South Atlantic Bight, and on the inner and OCS from southern New England to South Carolina. Both life stages are generally found over bottom depths between 33 ft and 1,200 ft, where bottom water temperatures are between 41 and 80°F, and salinities are above 5 parts per thousand (ppt). Spawning

probably does not occur at temperatures below 82 degrees Fahrenheit (°F) (MAFMC 2011). Spawning typically occurs during June and July and peaks progressively later at higher latitudes (NMFS 2025a).

3.2.3.2 Background

This species is found from Florida to Newfoundland, primarily from Cape Hatteras to the Gulf of Maine. Atlantic butterfish are a dull blue color on top, with pale sides and a silver belly (NMFS 2025a). They are generally six to nine inches in length and can weigh up to just over one pound (NC DEQ 2025). This species grows rapidly and are short-lived, not typically exceeding three years old. Both juveniles and adults are found over the shelf during the winter months and spend the spring and fall in the estuaries. Butterfish form schools in nearshore coastal waters and occasionally in inshore brackish waters over sandy, sandy-silt, and muddy substrates, and juveniles are often associated with floating weeds and detritus (NC DEQ 2025). During summer, butterfish move toward the north and inshore to feed and spawn. During winter, butterfish move southward and offshore to avoid cool waters. Butterfish are semi-pelagic, and form loose schools that feed upon small fish, squid, and crustaceans (NMFS 2025a).

3.2.4 ATLANTIC SEA HERRING (*CLUPEA HARENGUS*)

3.2.4.1 Essential Fish Habitat for Atlantic Sea Herring

EFH for adult Atlantic herring is found within the vicinity of the proposed project area and is defined in Amendment 3 to the *Atlantic Herring FMP* (NEFMC 2017). Adult herring EFH consists of sub-tidal pelagic habitats with maximum depths of approx. 1,000 ft throughout the region including many bays and estuaries. Adults make extensive seasonal migrations between summer and fall spawning grounds on Georges Bank and the Gulf of Maine and overwintering areas in southern New England and the Mid-Atlantic region. They seldom migrate beyond a depth of about 328 ft, and unless they are preparing to spawn, usually remain near the surface (NEFMC 2017). Spawning takes place on the bottom, generally in depths of 16 to 295 ft on a variety of substrates, and female herring can produce 30,000 to 200,000 eggs. The benthic zone is especially important for its reproduction as they deposit their eggs on rock, gravel, or sand ocean bottom. Larvae overwinter offshore, as well as in coastal waters, and become juveniles in the spring, which then school in inshore areas of the Gulf of Maine and off southern New England. In summer and fall, juveniles migrate from nearshore waters to wintering grounds in deep bays or offshore areas (ASMFC 2025).

3.2.4.2 Background

Atlantic herring are small silvery schooling fish that are silver in color with a blue-green back. They are a pelagic, schooling, plankton feeding species inhabiting both sides of the Atlantic. In the western North Atlantic this species is found in coastal and continental shelf waters from Labrador to Cape Hatteras, North Carolina. This species grows quickly up to 14 inches long and can live up to 15 years. Herring is an important species in the food web of the northwest Atlantic Ocean, and this species is heavily preyed upon by all kinds of marine fishes, marine mammals, and seabirds (NMFS 2025b).

3.2.5 ATLANTIC SURFCLAM (*SPISULA SOLIDISSIMA*)

3.2.5.1 Essential Fish Habitat for Atlantic Surfclam

EFH for adult and juvenile Atlantic surfclam can be found within the vicinity of the proposed project area and is managed under Amendment 12 to the *Atlantic Surfclam and Ocean Quahog FMP*. This species ranges from the Gulf of St. Lawrence to Cape Hatteras, North Carolina, and are most abundant on Georges Bank, the south shore of Long Island, New Jersey, and the Delmarva Peninsula (NMFS 2025e).

EFH for both life stages can be found throughout the substrate to a depth of three ft below the water/sediment interface. Surfclams generally occur from the beach zone to a depth of about 200 ft, but beyond about 125 ft abundance is low (MAFMC 1998a). Surfclams prefer more turbulent waters and bury themselves just below the sediment surface. Juveniles burrow in medium- to fine-grain sand in waters up to 80 ft deep, while adults prefer medium- to coarse-grain sand and gravel from beach zones to over 160 ft deep. Larvae spend about three weeks in the water column as plankton before settling to the bottom to live (NMFS 2025f).

3.2.5.2 Background

Surfclams are the largest bivalves found in the western North Atlantic, growing up to almost nine inches (although over eight inches is rare) (NMFS 2025e). Their shells are thick, triangular, and yellowish-white with rounded edges and concentric ridges that do not close fully. Surflclams grow quickly and can live up to 35 years, with those inhabiting open water living longer than those living inshore. Southern surfclam populations in warmer waters grow more slowly than the more northern populations). Surfclams are planktivorous filter feeders, straining tiny plants out of the water to eat. Adults primarily feed on diatoms, green algae, and naked flagellates (NMFS 2025e).

3.2.6 ATLANTIC SHARPNOSE SHARK (*RHIZOPRIONDON TERRANOVAE*)

3.2.6.1 Essential Fish Habitat for Atlantic Sharpnose Shark

EFH for the adult Atlantic sharpnose shark (Atlantic stock) can be found within the vicinity of the proposed project area. Atlantic sharpnose sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP*. This species is commonly found in the western Atlantic from New Brunswick, Canada through the Gulf of America and are commonly caught in U.S. waters from Virginia to Texas. EFH for the adult life stage extends from portions of Delaware Bay and Cape May, NJ to the mid-coast of Florida, including portions of Chesapeake Bay, with seasonal summer distribution in the northern part of the range. Offshore depth extent for this life stage is 590 ft (NOAA Fisheries 2017). They inhabit bays, estuaries, and coral reefs, often in areas with sandy or muddy bottoms, where they feed on small fish, shrimp, and crabs. Adult Atlantic sharpnose sharks are found primarily in the surf zone or offshore and exhibit seasonal behavior. They move between deeper waters in winter and return to inshore waters in the spring to mate and give birth. Females return to nearshore areas to give birth in June, with litters averaging approximately four pups (NMFS 2025d).

3.2.6.2 Background

Atlantic sharpnose sharks are small for sharks and have a gray streamlined body, and they get their name from their long, pointy snout. Adults have white spots on their sides and white along the edges of their pectoral fins. The lower and upper jaws of an Atlantic sharpnose shark have 24 or 25 rows of triangular teeth (NMFS 2025e). They can be found as deep as 920 ft but mostly remain in waters less than 32 ft deep, commonly found in bays, estuaries, harbors, and the surf zone, mostly over mud and sand bottoms. Atlantic sharpnose sharks can grow to up to 32 inches in length. Adults mature between two and three ft long and about two to four years of age and can live up to at least nine years old (NMFS 2025d).

3.2.7 BLACK SEA BASS (*CENTROPRISTUS STRIATA*)

3.2.7.1 Essential Fish Habitat for Black Sea Bass

EFH for juvenile black sea bass can be found within the vicinity of the proposed project area and is defined in Amendment 12 to the *Summer Flounder, Scup, and Black Sea Bass FMP*. Black sea bass is a

demersal species found in temperate and subtropical waters all along the Atlantic coast, from the Gulf of Maine to the Gulf of America. Offshore juvenile EFH is the demersal waters over the continental shelf from the Gulf of Maine to Cape Hatteras, North Carolina, and includes the estuaries in the summer and spring (MAFMC 1998b). Inshore, EFH is the estuaries where black sea bass are common in mixed or high-salinity zones. Generally, juvenile black sea bass are found in waters warmer than 43°F with salinities greater than 18 ppt and coastal areas between Virginia and Massachusetts (MAFMC 1998b). In winter, they are present offshore from New Jersey and south. Juvenile black sea bass are usually found in association with rough bottom, such as shellfish and eelgrass beds, and man-made structures in sandy-shelly areas; offshore clam beds and shell patches may also be used during the wintering. In the Mid-Atlantic, juveniles have a high dependency on firm hard bottom habitat, loose coarse bottom habitat, and oyster reef habitat (MAFMC 1998b). Black sea bass migrate offshore and south in the fall, returning north and inshore to coastal areas and bays in spring as temperatures change (NMFS 2025f).

3.2.7.2 Background

Black sea bass are blackish-brown in color with a slightly paler belly. Their fins are dark with dusky spots and the dorsal fin is marked with a series of white spots and bands (NMFS 2025f). During spawning, dominant males turn bright blue and have a blue hump on their heads. The species is strongly associated with structured habitats including jetties, piers, shipwrecks, SAV, and shell bottoms. Black sea bass grow slowly, up to two ft and nine pounds. Black sea bass spawn in coastal areas from January through July, and, depending on their size, females can produce between 30,000 and 500,000 eggs in a spawning season (NMFS 2025g). They are protogynous hermaphrodites—most black sea bass start out as females, and as they mature and grow they become males. Females can live up to eight years old while males may live up to 12. Black sea bass eat whatever prey is available, but prefer crabs, shrimp, worms, small fish, and clams.

3.2.8 BLACKTIP SHARK (*CARCHARHINUS LIMBATUS*)

3.2.8.1 Essential Fish Habitat for Blacktip Sharks

EFH for the adult and juvenile blacktip shark can be found within the vicinity of the proposed project area. Blacktip sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP*. EFH for these two life stages is found in Atlantic coastal areas from Florida to the Maryland/Virginia line (northern extent of EFH is Chincoteague Island), including the mouth of Chesapeake Bay and adjacent coastal areas along the Delmarva Peninsula (NOAA Fisheries 2017). Generally, the blacktip shark is primarily a continental shelf species found in waters throughout New England, the Mid-Atlantic, and Southeast and are common from Virginia through Florida off beaches, in bays, estuaries, over coral reefs, and off river mouths (NMFS 2025i). They mate between March and June with males maturing around five years of age, while females mature later at six to seven years of age. In the Atlantic, females give birth to an average of three pups per litter which are born in shallow nursery grounds away from the adult population. After giving birth, the females leave the nursery area while juveniles remain (NMFS 2025g).

3.2.8.2 Background

Atlantic blacktip sharks are grayish-brown with white on the belly and black tips on the pectoral, dorsal, and tail fins. Their bodies have a torpedo shape which allows them to swim through the water with little effort. Atlantic blacktip sharks are often confused with spinner sharks due to their similar size, shape, coloration, and behavior, as both species are known for leaping and spinning out of the water while feeding on schools of fish (NMFS 2025i). Atlantic blacktip sharks grow quickly and can reach up to six ft

in length. They often form large groups, segregated into separate schools of males and females when they are not mating. Blacktip sharks eat bony fishes, smaller sharks, squids, stingrays, shrimp, and crabs.

3.2.9 BLUEFISH (*POMATOMUS SALTATRIX*)

3.2.9.1 Essential Fish Habitat for Bluefish

EFH for the adult, juvenile, and egg life stages for bluefish can be found within the vicinity of the proposed project area and is defined under Amendment 1 to the *Bluefish FMP.* EFH for these three life stages consists of pelagic waters found over the continental shelf (from the coast out to the limits of the EEZ) from Nantucket Island, Massachusetts south to Cape Hatteras, North Carolina; the "slope sea" and Gulf Stream; and inshore waters (all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida) (MAFMC 1998c). Juvenile bluefish move inshore to estuaries which serve as their primary habitat; generally found in shallower inshore waters from June through October, Mid-Atlantic estuaries from May through October, and South Atlantic estuaries March through December. Adult bluefish are highly migratory and generally found in shelf salinities greater than 25 ppt, with distribution varying seasonally and according to the size of the individuals comprising the schools of fish. Adults travel northward in spring and summer and to the south in fall and winter. Southerly migration may be closer to shore than northerly movement, although movement in both directions is characterized by inshore-offshore movement (MAFMC 1998c). Females release their eggs in the open ocean. Larvae develop into juveniles near the surface in continental shelf waters and eventually move to estuarine and nearshore shelf habitats. Juveniles prefer sandy ocean bottoms but will also inhabit mud, silt, or clay ocean bottoms or vegetated areas (NMFS 2025h).

3.2.9.2 Background

Bluefish are blue-green with silvery sides and belly and have a prominent jaw with sharp compressed teeth (NMFS 2025h). Bluefish grow fast and can live up to 12 years and reach up to 30 pounds and 39 inches long. They are able to reproduce at age two, and females can have between 400,000 and two million eggs. Bluefish spawn multiple times in spring and summer. Bluefish have shearing jaws that allow them to ingest large parts, increasing the maximum size of the prey they can eat. They eat squid and fish, particularly menhaden and smaller fish, such as silversides. They gather by size in schools that can cover tens of square miles of ocean. Adults live in both inshore and offshore areas and favor warmer water (NMFS 2025h).

3.2.10 CLEARNOSE SKATE (*RAJA EGLANTERIA*)

3.2.10.1 Essential Fish Habitat for Clearnose Skate

EFH for adult and juvenile clearnose skates can be found within the vicinity of the proposed project area and is defined under Amendment 2 to the *Northeast Skate Complex FMP*. EFH for both life stages consists of sub-tidal bottom habitats in coastal and inner continental shelf waters from New Jersey to the St. Johns River in Florida, including the high-salinity zones of the Chesapeake Bay, Delaware Bay, and other bays and estuaries (NEFMC 2017). North of Cape Hatteras, skate move inshore and northward along the OCS during the spring and early summer, and offshore and southward during the autumn and early winter. In winter and spring, the juveniles are most densely concentrated on the continental shelf from the Delmarva Peninsula to Cape Hatteras out to the 66 ft contour. Adult and juvenile clearnose skates are found from the shoreline to 98-130 ft, primarily on mud and sand, but also on gravelly and

rocky bottom. This species prefers temperatures in the range of 48°F to 86°F but are most abundant from 48°F to 70°F in the northern part of its range and 66°F to 86°F around North Carolina (NEFMC 2017).

3.2.10.2 Background

This skate species occurs along the eastern coast from the Nova Scotian Shelf to northeastern Florida. It is diamond-shaped and generally a brownish-gray color with darker spots and bars and some irregular lighter shapes. It is named for the translucent areas on either side of its rostral ridge (the triangle of its pointed snout) (Florida Museum 2025a). The clearnose skate is characterized by the presence of a single row of thorns along the mid-ridge of its dorsal side from the shoulders to the tail. Like all skates, this species is oviparious, and eggs are usually laid in multiple pairs at intervals ranging from one to 13 days. Egg incubation may last at least three months but may decrease later in the season (Florida Museum 2025a). Food consists mainly of decapod crustaceans, bivalves, polychaetes, squids, and ray-finned fishes.

3.2.11 COMMON THRESHER SHARK (*ALOPIAS VULPINUS*)

3.2.11.1 Essential Fish Habitat for Thresher Shark

EFH for all life stages of the thresher shark can be found within the vicinity of the proposed project area. Thresher sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP*. There is currently insufficient data is available to differentiate EFH between the juvenile and adult size classes; therefore, EFH is the same for those life stages. EFH is located in the Atlantic Ocean from Georges Bank (at the offshore extent of the U.S. EEZ boundary) to Cape Lookout, North Carolina; and from Maine to locations offshore of Cape Ann, Massachusetts. EFH occurs with certain habitat associations in nearshore waters of North Carolina, especially in areas with temperatures from 64.8 to 69.7 °F and at depths from 15 to 45 ft (NOAA Fisheries 2017). Common thresher sharks are found in both coastal and oceanic waters but are more abundant near land with some seasonal abundance and north-south migrations along the U.S. East Coast, particularly in the offshore and cold inshore waters during the summer months (NOAA Fisheries 2017). These sharks are highly migratory, often traveling over entire ocean basins. Adults are commonly observed offshore over the continental shelf and in oceanic waters, as well as close to coastal areas in search of food, while juveniles inhabit coastal bays and nearshore areas (Florida Museum 2025e). These sharks are mostly seen on the surface but can inhabit waters down to 1312 ft deep. Common thresher sharks mate in late summer, and eggs are fertilized internally and develop within the mother. Each spring, females bear up to six fully developed young at a time after a long gestation period (approx. nine months).

3.2.11.2 Background

Thresher sharks can be a variety of colors including brown, gray, blue-gray, or blackish on the back and underside of their snout. They are lighter on the sides, and fully white below. Their tail fin is sickle-shaped, and the upper part is extremely long, about half the length of their body. These sharks are easily recognized by the long upper lobe of the caudal fin (top half of the tail), which they use to stun their prey, usually smaller schooling fish (Florida Museum 2025e). Common thresher sharks have a long life expectancy (up to 50 years), reproduce late in life, and only have a few young at a time. They grow slowly but can reach up to 20 ft long. Common thresher sharks are aggressive predators that feed near the top of the food chain on schooling fish, such as herring and mackerel, bluefish, bonito, and occasionally squid and seabirds (NOAA Fisheries 2017).

3.2.12 DUSKY SHARK (*CHARCHARINUS OBSCURUS*)

3.2.12.1 Essential Fish Habitat for Dusky Shark

EFH for the neonate life stage of the dusky shark can be found within the vicinity of the proposed project area. Dusky sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP*. EFH for neonate dusky sharks in the Atlantic Ocean is found in offshore areas of southern New England to Cape Lookout, North Carolina (NOAA Fisheries 2017). This is a wide-ranging coastal and pelagic species that prefers temperate waters, with habitats ranging from shallow inshore waters to beyond the continental shelf (Florida Museum 2025c). Neonates often inhabit nursery areas in coastal waters and the mouths of estuaries. Although the dusky shark feeds near the bottom, it can be found anywhere in the water column to a depth of 1,240 ft. The dusky shark is highly migratory in the western North Atlantic covering large distances moving south in winter and north in summer, with males and females making the seasonal migrations separately. Mating occurs in the spring followed by a gestational period of up to 16 months (Florida Museum 2025c).

3.2.12.2 Background

This species is a large blueish-gray shark with a short broadly rounded snout, no markings on its fins, and it has an inter-dorsal ridge. Dusky sharks grow slowly, up to a maximum of 12 ft and reaching 45 years old. The dusky shark preys on a variety of fish and invertebrates, such as herring, grouper, sharks, skates, rays, crabs, squid, and starfish, with younger sharks forming large feeding aggregations (Florida Museum 2025c). Heavy fishing pressure has affected this species heavily and has reduced its numbers; it is now a rare event to see a dusky shark in the Virginia region (VIMS 2025a).

3.2.13 LONGFIN INSHORE SQUID (*DORYTEUTHIS PEALEII*)

3.2.13.1 Essential Fish Habitat for Longfin Inshore Squid

EFH for the egg life stage of longfin inshore squid can be found within the vicinity of the proposed project area and is defined in Amendment 11 to the *Atlantic Mackerel, Squid, and Butterfish FMP*. EFH for the egg life stage occurs in inshore and offshore bottom habitats from Georges Bank southward to Cape Hatteras, generally where bottom water temperatures are between 50°F and 73°F, salinities are between 30 and 32 ppt, and depth is less than 164 ft (MAFMC 2011). Eggs have also been collected in bottom trawls in deeper water at various places on the continental shelf. The eggs for this species congregate in masses or "mops" and are demersal and anchored to the substrates on which they are laid, which include a variety of hard bottom types (e.g., shells, piers, and rocks), SAV, sand, and mud (MAFMC 2011). They spawn year-round with peak production in winter and summer. The female lays fertilized egg capsules that contain about 150 to 200 eggs each in clusters attached to the ocean bottom, with a typical female laying a total of 3,000 to 6,000 eggs. Eggs hatch between 11 and 26 days later depending on water temperature (NMFS 2025i).

3.2.13.2 Background

Longfin inshore squid are pink-ish orange in color, have large eyes, and an internal shell called a "pen." They are able to change their color and patterns to escape predators or disguise themselves from prey. These squid grow fast but have a short life span, reproducing right before they die at around six to eight months old (NMFS 2025j). Small immature longfin squid feed on plankton, and larger squid feed on crustaceans and small fish. North of Cape Hatteras, squid migrate seasonally – offshore during late autumn to spend the winter in warmer waters along the shelf edge and slope, and back inshore during the

spring where they remain until late autumn. Adults and juveniles migrate vertically in the water column, remaining near the seabed during the day and moving toward the surface at night (NMFS 2025i).

3.2.14 MONKFISH (*LOPHIUS AMERICANUS*)

3.2.14.1 Essential Fish Habitat for Monkfish

EFH for the egg/larvae monkfish life stages can be found within the vicinity of the proposed project area and is defined under Amendment 4 to the *Monkfish FMP*. EFH for this life stage occurs in pelagic habitats in inshore areas, and on the continental shelf and slope throughout the Northeast region; monkfish larvae are more abundant in the Mid-Atlantic region and occur over a wide depth range, from the surf zone to depths of 3281 to 4921 ft on the continental slope (NEFMC 2017). Monkfish are found in the Northwest Atlantic Ocean from the northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. They can tolerate a wide range of temperatures and depths, from inshore waters down to nearly 3,000 ft (NMFS 2025k). Monkfish spawn from February to October; females release large egg "veils" that can contain more than 1 million eggs that float near the surface along with the prevailing currents for 1 to 3 weeks until the veil disintegrates and the larvae hatch (NMFS 2025k).

3.2.14.2 Background

Monkfish have mottled dark brown to olive-green skin on top and whitish skin underneath. They are described as tadpole-like in appearance – a broad head with a large mouth and a narrow tapering body (NMFS 2025k). Males and females are able to reproduce when they reach about 14 inches and 16 inches long, respectively. Monkfish travel by slowly swimming or by using the sturdy base of their pectoral fins to walk. Monkfish are opportunistic feeders, eating whatever prey is most available at the time, with larvae feeding primarily on zooplankton. Monkfish migrate seasonally to spawn and feed, and adult monkfish spend most of their time on the ocean floor, typically on sand, mud, and shell habitats and often in a depression or partially covered in sediment. They also spend time off the bottom riding currents to assist with migration (NMFS 2025j).

3.2.15 RED HAKE (*UROPHYCIS CHUSS*)

3.2.15.1 Essential Fish Habitat for Red Hake

EFH for egg, larvae, juvenile, and adult red hake life stages can be found within the vicinity of the proposed project area and is defined in Amendment 14 to the *Northeast Multispecies FMP*. EFH for the egg/larvae life stage occurs in pelagic habitats in the Gulf of Maine, on Georges Bank, and in the Mid-Atlantic. Hake eggs are found in areas where sea surface temperatures are below 50°F along the inner continental shelf with salinity less than 25 ppt. Eggs are most often present during the months from May through November floating near the surface, and hatch about a week after spawning. Red hake larvae are most often observed from May through December, with peaks in September and October (NEFMC 2017). For juveniles, EFH can be found in intertidal and sub-tidal benthic habitats throughout the region on mud and sand substrates to a depth of 262 ft, including the bays and estuaries. Bottom habitats providing shelter are essential for juvenile red hake, including eelgrass, macroalgae, shells, anemone and artificial reefs. Newly settled juveniles occur in depressions on the open seabed, while older juveniles are commonly associated with shelter or structure and often inside live bivalves (NEFMC 2017). EFH for adult red hake is found in benthic habitats in the Gulf of Maine and the OCS and slope in depths of 50 – 2461 ft, and as shallow as 66 ft in a number of inshore estuaries as far south as Chesapeake Bay and are reported to be abundant on hard bottoms in temperate reef areas of Maryland and northern Virginia. Shell

beds, soft sediments (mud and sand), and artificial reefs provide essential habitats for adult red hake. They are usually found in depressions in softer sediments or in shell beds and not on open sandy bottom. (NEFMC 2017).

3.2.15.2 Background

Red hake vary in color depending on their environment, most commonly a reddish brown to olive-brown color with pale tan spots on their sides. They are a member of the cod family and have a barbel (whisker) on their chin. They have a small head with a large mouth with many small teeth (NMFS 2025l). Females are generally larger than males and reach a maximum length of 25 inches and almost eight pounds, and they generally do not live longer than eight years old. Red hake migrate seasonally, coming from as far north as Maine to the warmer southern waters of Virginia. They spawn in shallower waters during late spring and early summer and then return to deeper waters in the autumn (NMFS 2025k). As nocturnal semi-pelagic predators, red hake move up in the water column to feed at night, primarily between dusk and midnight. They return to rest on the ocean floor during the day, preferring sandy, muddy, or pebbly ocean bottoms. Red hake feed primarily on crustaceans, such as decapods and rock crabs, as well as fish, such as haddock, silver hake, sea robins, sand lance, mackerel, and other small red hake. Juveniles seek shelter from predators in scallop beds and commonly hide underneath sea scallops, and older larger red hake prefer deeper waters (NMFS 2025k).

3.2.16 SAND TIGER SHARK (*CARCHARIAS TAURUS*)

3.2.16.1 Essential Fish Habitat for Sand Tiger Shark

EFH for neonate/juvenile and adult life stages of the sand tiger shark can be found within the vicinity of the proposed action area. Sand tiger sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP*. Neonate EFH ranges from Massachusetts to Florida, Sandy Hook, and Narragansett Bays, as well as coastal sounds, lower Chesapeake Bay, Delaware Bay (and adjacent coastal areas), Raleigh Bay and habitats surrounding Cape Hatteras. Nursery areas within the Mid-Atlantic Bight (MAB) include estuaries, coastal sounds, and the Chesapeake, Delaware, Sandy Hook, and Narragansett Bays (NOAA Fisheries 2017). In the western Atlantic Ocean this species is commonly found off Cape Cod and Delaware Bay during the summer months and often found in shallow waters. Sand tiger sharks may occur singly or in small schools and are active primarily at night. The sand tiger shark is found inshore in areas including the surf zone, shallow bays, reefs, and wrecks, but can also be found in deeper waters of the continental shelf. They are generally coastal and usually found from the surf zone to approx. 82 ft; however, they may also be found in shallow bays and up to depths of 600 ft (NOAA Fisheries 2017).

3.2.16.2 Background

Sand tiger sharks are large, slow-moving, coastal sharks that have a flattened, conical snout. They are light brown on the dorsal surface with some scattered dark spots, and light colored ventrally. Sand tigers prefer hunting fish and invertebrates inshore near reefs, surf, and shallow bays, and migrate north-south with the seasonal temperature changes (Florida Museum 2025d). Although the shark can be found throughout the water column, it prefers to drift along the bottom. To become buoyant in the water column, the shark comes to the surface to gulp air, as it lacks the swim bladder that bony fish possess. The species is seasonally migratory, moving north during the summer and wintering in warmer southern waters. Common prey includes herring, bluefishes, flatfishes, eels, mullets, snappers, rays, squid, crabs, and other sharks (Florida Museum 2025d).

3.2.17 SANDBAR SHARK (*CARCHARHINUS PLUMBEUS*)

3.2.17.1 Essential Fish Habitat for Sandbar Shark

EFH for neonate, juvenile, and adult life stages of the sandbar shark can be found within the vicinity of the proposed project area. Sandbar sharks are highly migratory and are managed under the *Consolidated Atlantic HMS FMP*. For neonates, EFH consists of coastal areas from Long Island, New York, south to Cape Lookout, North Carolina, and from Charleston, South Carolina to Amelia Island, Florida. For juveniles, EFH includes coastal portions of the Atlantic Ocean between southern New England (Nantucket Sound, Massachusetts) and Georgia in water temperatures ranging from 68 to 75°F and depths from 2.8 to 20.9 ft. For adults, EFH includes coastal areas from southern New England to the Florida Keys ranging from inland waters of Delaware Bay and the mouth of Chesapeake Bay to the continental shelf break (NOAA Fisheries 2017). Important nursery EFH includes Delaware Bay, Delaware and New Jersey; Chesapeake Bay, Virginia; Great Bay, New Jersey; and the waters off Cape Hatteras, North Carolina. In all nursery areas between New York and North Carolina, EFH is associated with salinities that vary from 15 to 35 ppt, water depths that range from 3 to 75 ft, and sand, mud, shell, and rocky sediments/benthic habitat (NOAA Fisheries 2017). From late May to early June and after approximately nine months of gestation, females head to the nursery grounds within shallower inlets and coastal bays of Virginia to give live birth to litters of between six and 13 pups from June through August (NMFS 2025m). The pups remain in the area until September or October, when they school and migrate south along with the adults to the warmer waters of North Carolina and Florida.

3.2.17.2 Background

The sandbar shark is one of the largest shark species found in coastal waters, preferring sandy or muddy areas in temperate and tropical waters throughout the world. They have brownish-gray bodies, white bellies, a tall dorsal fin on their back and large pectoral fins on either side of their body (NMFS 2025l). Their snouts are rounded and shorter than the average shark. Sandbar sharks are estimated to live approximately 30 years. Sandbar shark pups measure around two ft at birth, and as adults they can measure up to eight ft long and weigh as much as 200 pounds. Sandbar sharks rarely venture into freshwater and prefer live along the ocean bottom in shallow coastal waters over smooth sandy substrates, including in bays, harbors, and estuaries – only occasionally seen at the water's surface. They spend most of their time in water from 60-200 ft deep, but travel into much deeper water to undergo seasonal migrations that are influenced by temperature and ocean currents. Adult sandbars move as far north as Cape Cod during the warmer summer months and return to the south at the onset of the cooler weather. Sandbar sharks are opportunistic feeders that eat bony fish, smaller sharks, octopuses, squid, eels, skates, rays, shrimp, and crabs (NMFS 2025l).

3.2.18 SCUP (*STENOTOMUS CHRYSOPS*)

3.2.18.1 Essential Fish Habitat for Scup

Designated EFH for the juvenile and adult life stages of scup can be found within the vicinity of the proposed action area and is defined in Amendment 12 to the *Summer Flounder, Scup, and Black Sea Bass FMP*. For both life stages, offshore EFH is designated as the demersal waters over the continental shelf (from the coast out to the limits of the EEZ) from the Gulf of Maine to Cape Hatteras, North Carolina; and inshore waters such as estuaries with brackish and higher salinity zones (MAFMC 1998b). Generally during summer and spring, juvenile scup are found in estuaries and bays between Virginia and Massachusetts, in association with various sands, mud, mussel and eelgrass bed type substrates and in

water temperatures greater than 45°F and salinities greater than 15 ppt. From November through April, wintering adults are usually found in offshore waters south of New York to North Carolina in waters above 45°F, and prefer soft, sandy bottoms, on or near structures such as rocky ledges, wrecks, artificial reefs, and mussel beds (MAFMC 1998b). Scup migrate north and inshore to spawn in the spring, then migrate south and offshore in autumn as the water cools, arriving by December in offshore areas where they spend the winter (NMFS 2025m). Individual scup spawn once a year over weedy or sandy areas along the inner continental shelf in southern New England south to the New York Bight, beginning in the spring during the inshore migration and lasting from May to August with a peak in June. As larvae mature, they settle to the sea floor and develop into juveniles (MAFMC 1998b).

3.2.18.2 Background

Scup are dusky brown with bright silvery reflections below and spiny fins. Their front teeth are very narrow, almost conical, and they have two rows of molars in the upper jaw. Scup grow slowly, up to about 20 inches long and four pounds. Scup are found in the Northwest Atlantic Ocean, primarily between Cape Cod, Massachusetts, and Cape Hatteras, North Carolina. They can live a relatively long time, up to about 20 years (NMFS 2025m). Scup are typically benthic browsers—they nibble on organisms that live on the ocean bottom, grasping food with their incisors and crushing hard-shelled animals with their strong molars. Prey items include small crustaceans, mollusks, small squid, detritus, insect larvae, and small fish.

3.2.19 SKIPJACK TUNA (*KATSUWONUS PELAMIS*)

3.2.19.1 Essential Fish Habitat for Skipjack Tuna

Designated EFH for adult skipjack tuna can be found within the vicinity of the proposed project area. Skipjack tuna are managed under the *Consolidated Atlantic HMS FMP*. For adults, EFH occurs in coastal and offshore habitats between Massachusetts and Cape Lookout, North Carolina, and localized areas in the Atlantic off South Carolina and Georgia and the northern east coast of Florida (NOAA Fisheries 2017). Skipjack tuna are found in tropical, subtropical, and warm temperate waters of all oceans. In the western Atlantic, skipjack is found from Massachusetts to Brazil and the Caribbean. Skipjack tuna are a pelagic species (NMFS 2025n). They mostly live in the open ocean, but they may spend part of their life in nearshore waters. They can be found in surface waters and to depths of 850 ft during the day and generally stay near the surface at night. Skipjack tuna is an HMS, swimming long distances to feed and reproduce. They swim in schools, especially around floating objects or hydrographic features, such as convergence zones and boundaries between cold and warm water masses. They also school around upwelling areas, where dense, cooler, and usually nutrient-rich water is pushed toward the ocean surface, replacing the warmer, usually nutrient-depleted surface water (NMFS 2025n).

3.2.19.2 Background

Skipjack tuna do not have scales except for a band of large, thick scales behind the head and the faint lateral line running lengthwise down each side of the fish. Their back is dark purplish blue, and their lower sides and belly are silvery with several longitudinal dark bands (NMFS 2025n). Like other tropical tunas, skipjack tuna grow fast, up to over three ft and 40 pounds, and have a relatively short life span, around seven years. During spawning season in subtropical waters from spring to early fall, skipjack tuna spawn as often as once per day and, depending on their size, females can produce between 100,000 and two million eggs per year. Once fertilized, the eggs hatch in about one day (depending on the

temperature). Skipjack tuna are opportunistic feeders, preying on a variety of fish, crustaceans, cephalopods, and mollusks (NMFS 2025n).

3.2.20 SPINY DOGFISH (*SQUALUS ACANTHIAS*)

3.2.20.1 Essential Fish Habitat for Spiny Dogfish

Designated EFH for the sub-adult male, sub-adult female, and adult male life stages for the spiny dogfish can be found within the vicinity of the proposed project area and is defined in Amendment 3 to the *Spiny Dogfish FMP*. For sub-adults, EFH is found in pelagic and epibenthic habitats primarily in the Gulf of Maine and on the OCS from Georges Bank to Cape Hatteras (MAFMC 2014). Adult male spiny dogfish are found over a wide depth range in full salinity seawater (32-35 ppt) where bottom temperatures range from 45 to 59°F and are widely distributed throughout the region in the winter and spring when water temperatures are lower. Very few adults remain in the Mid-Atlantic area in the summer and fall after water temperatures rise above 59°F (MAFMC 2014). Sub-adult males are not as widely distributed over the continental shelf as the females and are generally found in deeper water. Much of the population travels north in the spring and summer and south in the fall and winter. They spawn in winter in offshore waters, with females having live young and averaging six pups per season.

3.2.20.2 Background

Spiny dogfish are gray above and white below with characteristic white spots, with a slim body and narrow pointed snout. They can grow to just over four ft long with females growing larger than males. Spiny dogfish are found in the North Atlantic Ocean mostly in the temperate and subarctic areas, both inshore and offshore to the OCS (NMFS 2025o). In the Northwest Atlantic, they are found from Labrador to Florida and are most abundant between Nova Scotia and Cape Hatteras. They swim in large schools and migrate seasonally with changes in water temperature. Although dogfish can be found at the surface and in the water column, they are demersal and spend most of their time on the bottom. Like all sharks, dogfish grow slowly, mature late in life, and live a long time (35 to 40 years) (NMFS 2025o). They are opportunistic feeders, preying on whatever is most available. Smaller spiny dogfish tend to feed primarily on crustaceans, while larger dogfish like to eat jellyfish, squid, and schooling fish.

3.2.21 SMOOTH DOGFISH (*MUSTELUS CANIS*)

3.2.21.1 Essential Fish Habitat for Smooth Dogfish

Designated EFH for all life stages of smooth dogfish (Atlantic stock) can be found within the vicinity of the proposed project area. Smooth dogfish are managed under the *Consolidated Atlantic HMS FMP*. In 2010 the smoothhound shark management group was added as a management unit under this FMP. This shark complex consists of three species – smooth dogfish, Florida smoothhound, and Gulf smoothhound. These three species are difficult to differentiate, complicating separate EFH determination for each species. Smooth dogfish is the only smoothhound shark complex species found in the Atlantic, so all EFH identified in the Atlantic is exclusively for smooth dogfish (NOAA Fisheries 2017). At this time, available information is insufficient for the identification of distinct EFH for each life stage; therefore, all life stages are combined in the EFH designation.

EFH in Atlantic coastal areas ranges from Cape Cod Bay, Massachusetts to South Carolina, inclusive of inshore bays and estuaries (e.g., Pamlico Sound, Core Sound, Delaware Bay, etc.). EFH also includes continental shelf habitats between southern New Jersey and Cape Hatteras, North Carolina (NOAA Fisheries 2017). Smooth dogfish are a migratory species that respond to changes in water temperature.

They primarily congregate between southern North Carolina and the Chesapeake Bay in the winter. In the spring, smooth dogfish move along the coast when bottom water warms up to at least 43 to 45°F. As temperatures get colder, smooth dogfish move offshore to their wintering areas. Female smooth dogfish have an 11–12-month gestation period after which they have a litter between four and 20 pups during late spring and early summer. An abundance of young within estuaries strongly suggests that these shallower areas are critically important nursery habitats for smooth dogfish within the Mid-Atlantic region (NOAA Fisheries 2017).

3.2.21.2 Background

This small, slender shark has two large spineless dorsal fins with the first dorsal slightly larger than the second. The smooth dogfish has a tapering, blunt snout and a spiracle behind each narrow eye. Coloration of the smooth dogfish varies from gray to brown, and this shark has a unique ability to change its coloration to camouflage with its surroundings (NOAA Fisheries 2017). This species grows quickly and can reach up to 59 inches long and weigh up to 27 pounds. The small teeth of the smooth dogfish are flat and blunt, used to crush and grind prey items rather than bite and tear as with other species of sharks. Smooth dogfish have diets that are primarily invertebrates, feeding on large crustaceans including crabs and lobsters. Primarily a nocturnal species, smooth dogfish are commonly found on continental shelves, in bays and other inshore waters, preferring shallow waters of less than 60 ft but may be found to depths of up to 655 ft. This species has also been found on occasion in freshwater although it is unlikely they can survive freshwater for extended periods of time. The smooth dogfish migrates seasonally, moving north in the spring and south in the autumn.

3.2.22 SUMMER FLOUNDER (*PARALICTHYS DENTATUS*)

3.2.22.1 Essential Fish Habitat for Summer Flounder

Designated EFH for adult and juvenile life stages of summer flounder can be found within the vicinity of the proposed project area and is defined in Amendment 12 to the *Summer Flounder, Scup, and Black Sea Bass FMP*. EFH for both life stages consists of waters over the continental shelf (from the coast out to the limits of the EEZ) from the Gulf of Maine to Cape Hatteras, North Carolina, and inshore estuaries where summer flounder are found in mixed or higher salinity zones (MAFMC 1998b). Juveniles generally use a variety of estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, silt, and open bay areas in water temperatures greater than 37°F and salinities from 10 to 30 ppt. Adult summer flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the OCS at depths of 500 ft in colder months and prefer sandy habitat in order to avoid predation and conceal themselves from prey. In Virginia, adult flounder use the Eastern Shore seaside lagoons and lower Chesapeake Bay as summer feeding areas. This species exhibits strong seasonal inshore-offshore movements caused by temperature shift, concentrating in shallow warm water at the upper reaches of the channels and larger tidal creeks on the Eastern Shore in April and then moving toward the inlets as spring and summer progress (MAFMC 1998b). Spawning occurs several times throughout the spawning season over the open ocean areas of the shelf during the fall and winter while the fish are moving offshore or onto their wintering grounds. Spawning peaks in October and November when water temperatures change and autumn plankton is most productive (NMFS 2025p). In the MAB north of Chesapeake Bay, spawning and the offshore limits of migration coincide with the inshore edge of the mass of cold bottom water which disappears along with the thermocline in November (MAFMC 1998b).

3.2.22.2 Background

Summer flounder have flat bodies and are brownish-gray with white below, able to change their coloring to blend in with the texture and color of the bottom where they live. They have spots on their back and can be distinguished because at least five of these dark spots are arranged in an "X" pattern. Summer flounder is a left-eyed flatfish (both eyes are on the left side of its body when viewed from above with the dorsal fin facing up). When larvae develop into juveniles, their right eye moves across the top of the head to the left side (NMFS 2025p). Summer flounder grow fast (males approx. two ft in length and females grow up to three ft) and have a relatively short life, about 12 to 14 years. Juveniles prey on crustaceans, small pelagic fish, and shrimp while adults feed opportunistically on a variety of fish, crustaceans, and squid. Adult summer flounder lay on the ocean floor concealed, partly by sand and partly by their coloration, and wait for their prey to swim by and when suitable prey appears, they are ambushed (NMFS 2025q).

3.2.23 TIGER SHARK (*GALEOCERDO CUVIER*)

3.2.23.1 Essential Fish Habitat for Tiger Sharks

Designated EFH for adult and juvenile life stages of tiger sharks can be found within the vicinity of the proposed project area; EFH for both life stages are combined due to similarity in habitat. Tiger sharks are managed under the *Consolidated Atlantic HMS FMP*. EFH in the Atlantic Ocean extends from offshore pelagic habitats associated with the continental shelf break at the seaward extent of the EEZ boundary (south of Georges Bank, off Massachusetts) to the Florida Keys, inclusive of offshore portions of the Blake Plateau (NOAA Fisheries 2017). The tiger shark inhabits warm waters in both deep oceanic and shallow coastal regions, undertaking long distance movements to the open waters of the Gulf Stream, overlapping with the distribution of their prey along the Gulf Stream current system. In the North Atlantic they are rarely encountered north of the MAB (NOAA Fisheries 2017). A female tiger shark gives birth every three years, producing as many as 70 young per litter, although most litters contain about 20-30 pups (VIMS 2025b).

3.2.23.2 Background

Tiger sharks are named for their distinctive color pattern with a gray body and vertical bars or spots on the flanks with a pale underside. The markings are especially distinctive in juveniles but diminish with age. Its characteristic tiger-like markings and unique teeth make it one of the easiest sharks to identify. Tiger sharks are one of the larger species of sharks and grow very fast compared to some other species, up to approx. 18 ft for females and 12 ft for males. This species is found in nearly all warm temperate and tropical waters, and occasional visitors to Virginia waters are usually found at least 10-20 miles offshore (VIMS 2025b). The majority of individuals that occur in Mid-Atlantic region are sub-adults and adults; the juveniles are born farther south and remain there during their first years. The tiger shark was once a common coastal shark of the Virginia region, but its abundance declined markedly from the 1970s into the 1990s (VIMS 2025b). They can be found in inshore waters ranging from three ft to at least 500 ft but are most common in waters about 60 ft deep. These sharks are opportunistic feeders, feeding on bony fishes, sharks, rays, sea turtles, sea snakes, sea birds, marine mammals, carrion, and garbage.

3.2.24 WINDOWPANE FLOUNDER (*SCOPTHALMUS AQUOSUS*)

3.2.24.1 EFH for Windowpane Flounder

Designated EFH for adult, juvenile, larval, and egg life stages of windowpane flounder can be found within the vicinity of the proposed action area. This species is managed as part of the Southern New England/Mid-Atlantic stock, and current EFH is defined in Amendment 14 to the *Northeast Multispecies FMP* (NEFMC 2017). EFH for these life stages consist of pelagic habitats on the continental shelf from Georges Bank through the Mid-Atlantic south to Cape Hatteras, and in mixed and high-salinity zones of coastal bays and estuaries throughout the region (NEFMC 2017). Generally, windowpane flounder larvae are found at sea surface temperatures less than 68°F and water depths less than 250 ft. Larvae are often present from February to November with peaks in May and October in the middle Atlantic and July through August on Georges Bank. For juveniles, EFH is found on mud and sand substrates and extends from the intertidal zone to a maximum depth of 196 ft with young-of-the-year juveniles preferring sand over mud. EFH for adult windowpane flounder is found on mud and sand substrates and extends from the intertidal zone to a maximum depth of 230 ft (NEFMC 2017). In the Mid-Atlantic, windowpane flounder typically spawn during April to May, with peak spawning occurring in October to November.

3.2.24.2 Background

Windowpane flounder have thin, almost translucent rounded bodies and are nearly as wide as they are long. The tips on the dorsal fin are free and have a fringe-like appearance (NMFS 2025q). When windowpane flounder first hatch, their eyes are symmetrical with an eye on each side of their head. As the fish grows, it flattens out and the right eye moves over to the left side of its head. After metamorphosis, young windowpane flounder typically settle to the bottom in inshore areas and migrate to deeper offshore waters as they get older (NMFS 2025q). Adult windowpane flounder typically grow to 10 to 12 inches in length. Windowpane flounder feed on small crustaceans and various fish larvae.

3.2.25 WINTER SKATE (*LEUCORAJA OCELLATA*)

3.2.25.1 Essential Fish Habitat for Winter Skate

Designated EFH for adult and juvenile life stages of winter skate can be found within the vicinity of the proposed action area. This species is managed as part of the Southern New England/Mid-Atlantic stock, and current EFH is defined in Amendment 2 to the *Northeast Skate Complex FMP* (NEFMC 2017). There are no egg or larval EFH designations for any of the skates because egg case distributions and habitat associations are not well understood, and they emerge from their egg cases as fully developed juveniles so there is no larval stage. For juveniles, EFH consists of sub-tidal benthic habitats over sand, gravel, and mud in coastal waters from eastern Maine to Delaware Bay and on the continental shelf in southern New England and the Mid-Atlantic region, and on Georges Bank, from the shoreline to a maximum depth of 300 ft including the high-salinity zones of many bays and estuaries (NEFMC 2017). For adults, EFH includes bottom substrates of sand and gravel or mud in Cape Cod Bay, on Georges Bank, the southern New England shelf, and through the MAB to North Carolina. Winter skate adults are generally found at a depth range from shoreline to 1,217 ft and are most abundant at depths of 364 ft. Preferred temperatures are from 30°F to 70°F, with most found in water with temperatures ranging from 41°F to 59°F, depending on the season (NEFMC 2017).

3.2.25.2 Background

Skates are a relative of sharks and rays and have a kite-like shape. Winter skates are light brown covered with small dark spots, and spines cover most of their back (NMFS 2025r). The winter skate is found all along the western Atlantic, from Newfoundland to North Carolina. Winter skates have large bodies and can grow up to 5 ft in length and can live for about 20 years. Their eggs are enclosed in a hard leathery case called a "mermaid's purse." In the cooler winter months, the winter skate comes closer to shore. Winter skates prefer sandy and gravelly bottoms but may also be found in mud substrates. Although there is no defined reproductive season, skate reproduction peaks during the summer months. Each female produces approximately 40 egg cases per year, each containing one embryo. The egg cases are released by the female in offshore waters on rock bottom habitats. The eggs incubate for 6 to 12 months, and young skates have the adult form when they hatch (NMFS 2025r). The skate lies on the ocean floor covered by a layer of sand during the day, and at night preys upon crabs, worms, squid, shrimp, clams, and occasionally small fish.

3.2.26 WITCH FLOUNDER (*GLYPTOCEPHALUS CYNOGLOSSUS*)

3.2.26.1 Essential Fish Habitat for Witch Flounder

Designated EFH for the egg life stage of witch flounder can be found within the vicinity of the proposed action area. This species is managed as part of the Southern New England/Mid-Atlantic stock, and current EFH is defined in Amendment 14 to the *Northeast Multispecies FMP*. For eggs and larvae life stages (defined together), EFH is found in pelagic habitats on the continental shelf throughout the Northeast region spanning from Maine through Cape Hatteras, North Carolina (NEFMC 2017). This species typically spawns in cold water during March to November, with peak spawning occurring during the summer months. Witch flounder living near the northern end of the species' range typically spawn later in the year than those living farther south. They spawn on or near the bottom of the ocean, and the fertilized eggs float and develop higher in the water column (NMFS 2025t).

3.2.26.2 Background

Relative to other flatfish in the region, witch flounder are a slow-growing, late-maturing, long-lived, right-eyed species of flounder. They have a relatively small head, small mouth, and narrow body covered in smooth scales. They have approximately 12 indentations on the underside of their head. The top side of a witch flounder is generally grayish-brown in color, while the bottom side is white and covered with tiny dark dots. The top side pectoral fin is dusky or even black with a narrow light distal border (NMFS 2025s). Witch flounder can grow up to 31 inches long, and female witch flounder are larger, heavier, and live longer than males. When witch flounder first hatch, their eyes are symmetrical, with an eye on each side of their head. As the fish grows, it flattens out and the left eye moves over to the right side of its head. After this metamorphosis, the juvenile settles to the ocean bottom. They do not complete metamorphosis until they are between 4 and 12 months old. Witch flounder primarily feed on polychaete worms, but they also prey on other bottom-dwelling invertebrates such as sea cucumbers, small crustaceans, and small mollusks (NMFS 2025s).

3.2.27 YELLOWFIN TUNA (*THUNNUS ALBACARES*)

3.2.27.1 Essential Fish Habitat for Yellowfin Tuna

Designated EFH for the juvenile life stage of yellowfin tuna can be found within the vicinity of the proposed action area. Yellowfin tuna are highly migratory and are managed under the *Consolidated*

Atlantic HMS FMP (NOAA Fisheries 2017). EFH for the juvenile life stage is found in offshore pelagic habitats seaward of the continental shelf break between the seaward extent of the U.S. EEZ boundary on Georges Bank and Cape Cod, Massachusetts; offshore and coastal habitats from Cape Cod to the mid-east coast of Florida and the Blake Plateau; and locally distributed in the Florida Straits and off the southwestern edge of the West Florida Shelf (NOAA Fisheries 2017). In Final Amendment 10 to the *Consolidated Atlantic HMS FMP*, juvenile EFH boundaries were expanded in the Atlantic Ocean north of the Carolinas to include pelagic habitats between the continental shelf break and the seaward extent of the U.S. EEZ in order to reflect all available best scientific information on distribution and habitat utilization (NOAA Fisheries 2017). Spawning occurs throughout the year in the core areas of the species' distribution (between 15° N lat. and 15° S lat.).

3.2.27.2 Background

Yellowfin tuna are torpedo-shaped and metallic dark blue on the back and upper sides changing from yellow to silver on the belly. Yellowfin tuna can be distinguished from other tunas by their long, bright yellow dorsal fin and a yellow strip down the side (NMFS 2025t). Yellowfin are characteristically large in size, fast growing, and short-lived, growing quickly up to 400 pounds. Atlantic yellowfin tuna is a schooling oceanic species, found in tropical and temperate waters around the world. Juveniles are often found at the surface in mixed schools of skipjack and bigeye tuna. Adult yellowfin tuna are generally confined to the upper 100 m of the water column due to their intolerance of low oxygen concentrations. Females spawn about once every 3 days during the spawning season producing an average of 1 to 4 eggs each time they spawn. Yellowfin tuna feed near the top of the food chain on fish, squid, and crustaceans (NMFS 2025u).

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 ANALYSIS APPROACH

The analysis considers the nature and intensity of stressors, the susceptibility of managed species and habitat elements, and the spatial/temporal co-location of stressors and susceptible organisms. Stressors would include suspended sediments, entrainment, accidental petroleum release, vessel collisions, and availability of prey species. All other stressors imposed by dredging, beach renourishment, and breakwater and seawall construction are not relevant because their nature and intensity is discountable, stressor and receptor are not co-located, and EFH and managed species have little-to-no meaningful susceptibilities in this context (i.e., artificial lighting, noise, ingestion, entanglement, electromagnetic, and chemical stressors). The rationale for this write-off is that these stressors were not identified in the Description of Proposed Action and Alternatives, were not imposed by similar construction efforts, and were absent from EFHAs of similar construction actions. These stressors will not be carried forward in the EFHA. Stressors are identical to prior permitted actions, documented during the SRIPP, Post-Sandy, and SERP (NASA 2010, NASA 2013, NASA 2019).

4.2 WATER COLUMN ESSENTIAL FISH HABITAT

4.2.1 AFFECTED ENVIRONMENT

Numerous tidal inlets, marshes, bays, and creeks are found in and around Wallops Island. Surface waters and water column EFH in the vicinity of Wallops Island are primarily saline to brackish and are influenced by the tides and surface runoff. Marine waters in the project area maintain a fairly uniform salinity range (32 to 36 ppt) throughout the year, with pockets of high-salinity water (38 ppt) found near the Gulf Stream in the fall (NASA, 2016). In the winter, the water column is vertically well mixed, with water temperatures averaging 57°F at the surface and 52°F at depths greater than 660 ft. In summer (August), the water column is vertically stratified with 77°F water near the surface and 50°F water at depths greater than 660 ft (NASA, 2016). As reported in the 2013 Post-Hurricane Sandy EA, Unnamed Shoal A shows bedforms (i.e., ripples) on its surface, indicating that wave energy reaches the seafloor and mixing occurs throughout the water column.

4.2.2 ENVIRONMENTAL CONSEQUENCES

4.2.2.1 Suspended Sediments

The *2010 Final SRIPP PEIS, 2013 Final Post-Hurricane Sandy EA* and *2019 Final SERP EA* provided an analysis of the potential offshore water quality effects that could result from proposed dredging, pump-out buoy operations, overflow from dredges, and vessel activity during transit between Unnamed Shoal A and Wallops Island, which would cause sediment to be suspended in the water column. The length and shape of the plume depends on the hydrodynamics of the water column and the sediment grain size. Sediment samples collected on Wallops Island in 2007 and 2009 indicated native median grain sizes ranging from approximately 0.18 to 0.27 millimeters (mm) corresponding to fine sand per the American Society for Testing and Materials unified classification system (ASTM D2487**)**. However, samples collected during the initial beach fill indicate that the sediment within the nourished portion of the beach is coarser, with median grain sizes between approximately 0.28 and 0.54 mm, corresponding to fine to fine to medium sand. Given that the dominant substrate material at the borrow site is fine to medium sand, it is expected to settle steadily and cause less turbidity and oxygen demand than finer-grained sediments would cause.

No appreciable effects on dissolved oxygen, pH, or temperature are anticipated because the dredged material has low levels of organics and low biological oxygen demand. Additionally, dredging activities would occur within the open ocean where the water column is subject to constant mixing and exchange with oxygen-rich surface waters. The increased turbidity may temporarily clog the gills of fish, preventing them from extracting oxygen from the water and interfering with feeding ability. Turbidity resulting from the dredging and vessel activities would be short-term (i.e., hours) and would not be expected to extend more than several thousand ft from the dredging operation. It is anticipated that the project would have only temporary minor effects on offshore water quality from beach replenishment activities.

The Proposed Action would also impose turbidity and water quality stressors during beach nourishment. Renourishment activities would cause sediment to be suspended in the water column during sand placement and grading activities. Suspended solid concentrations would be lower than levels considered toxic to fish. The most likely effect of suspended sediments would be to alter behaviors of EFH species as these highly mobile species alter movement to avoid sediment plumes. Such movements are likely to be insignificant.

Construction of breakwaters would have the potential to result in sediment suspension during sheet pile driving and placement of materials to construct breakwaters. Increases in suspended sediment would be temporary, localized, and would dissipate upon cessation of sediment disturbing activities. Rocks used for armoring and to construct the breakwaters would be made of "clean" material, further minimizing the potential for release of suspended material into the water column. Crane barges would be continually moved during construction, as would vessels carrying construction materials. Construction vessels would maintain at least two ft of clearance from the bottom of the ocean or work only at tide levels sufficient to keep the barges off the ocean bottom to further minimize sediment disturbance. Assembling temporary bulkheads (or tresses) for constructing the breakwaters, instead of performing the work from a barge, would eliminate the potential risk of schedule delays and hazard to personnel and equipment from barge construction during fall and winter storm events or poor surf conditions. Temporary bulkhead would use approximately 1,000 cubic yards of temporary sand (either "clean" compatible sand from an offsite source or the same as use for beach fill) per access. Once breakwater construction is completed, removal of the sheet piles would release suspended material into the nearshore water column.

4.2.2.2 Accidental Petroleum Release

Sand placement, seawall construction, breakwater construction, and temporary bulkhead installation activities in the shoreline infrastructure protection area could have short-term, minor effects on nearshore water quality resulting from the accidental release of petroleum products or other contaminants from construction vehicles and heavy equipment used to transport and deposit the sand and seawall and breakwater materials. Effects to offshore water quality may result in the accidental release of petroleum products or other contaminants from dredges, crew vessels, or barge/tenders during dredging or transit. The potential for such contamination-related effects to occur would be minimal, as contractors would implement best management practices for vehicle and equipment fueling and maintenance, as well as site-specific spill prevention and control measures (NASA 2010).

4.2.2.3 Vessel Collisions

The nature and intensity of physical strike and disturbance stressors imposed by the construction and dredging phase of the proposed project would be minimal. Physical strike stressors may originate from vessels such as barges, tugboats, and crewboats. All physical strike stressors would be slow-moving and

mortality to individual managed species is possible but not probable. During dredging, it is possible that EFH species would become entrained in the dredge as described in previous consultation documents. The intensity of physical disturbance stressors would be minimal. Although the entire seafloor footprint of the proposed breakwaters would be physically contacted by construction equipment and materials, the contact is both incremental and slow. Construction materials (e.g., rocks and geotextile mattresses) would be placed individually. Physical disturbance stressors would therefore be minimal intensity but relatively long-term duration.

All of the nearshore intertidal and sub-tidal water column EFH would be exposed to moderate and episodic (hours at a time) turbidity stressors for the duration of the project. The dredging methods required for transporting sand from offshore shoals would produce a turbidity plume, entrainment of sessile species, and could introduce vessel collisions with EFH managed species and their prey. Equipment and materials would displace water column EFH, managed species, and their prey. However, the nature and intensity of turbidity and water quality stressors would be short term. Limiting vessel speeds coupled with the ability of species to detect and avoid vessels would reduce the possibility of collisions with project vessels. Moreover, while 100 percent of sessile organisms, eggs, and some subadults may become entrained in the dredge, entrainment of large mobile animals is relatively rare, particularly in the open ocean where individuals' movements would not be restricted; therefore, no change to methodology is proposed that would affect this and the possibility persists.

4.3 BENTHIC ESSENTIAL FISH HABITAT

4.3.1 AFFECTED ENVIRONMENT

Wallops Island is one of the twelve Virginia barrier islands fronting the Atlantic Ocean. Though it displays generally similar morphologic features as neighboring islands shaped by mixed energy conditions (i.e., sedimentary processes driven by the interplay of waves and tide), localized processes occurring over both the short- and long-term have led to Wallops Island being distinct from others in the Virginia barrier island chain. Of the Virginia barrier islands, Wallops Island is the only one that has been nourished. Unconsolidated sand is the primary habitat type within the proposed action area. Along the beach, the exposed habitat is restricted to the mixing zone of an active beach coastline.

Bottom-dwelling invertebrates provide a critical link in the productivity of the marine waters off of Wallops Island. The majority of the benthos live in or on the upper six inches of sediment and are an important food resource for fish. The benthos includes organisms that live on the sediment surface (epifauna), such as starfish and sand dollars (*Echinarachinus parma*), as well as organisms that live within the sediment (infauna), such as clams and worms. Below the mid-tide line is the surf zone where coquina clams (*Donax variabilis*), other shellfish, and a variety of amphipods are prevalent. Underwater photographic studies conducted of Unnamed Shoal A during the development of the *2010 Final SRIPP PEIS* determined that the dominant epifaunal benthos included sand dollars, hermit crabs (*Pagurus spp*.), crabs (*Libinia spp., Cancer spp*.), moon shell (*Polinices spp*.), and whelk (*Busycon spp*.).

4.3.2 ENVIRONMENTAL CONSEQUENCES

Removal of sediments from Unnamed Shoal A would affect infauna, as well as species which prey upon them. Benthic prey items in the renourishment area and construction areas would be buried resulting in the temporary loss of foraging habitat. It is expected that recolonization of the nearshore benthos will occur within 2 to 6 months after each renourishment cycle is complete. Additionally, the placement of

sand seaward of the existing seawall, where currently limited or no beach area exists, would have beneficial effects on benthic organisms by restoring and creating new beach and breakwater habitat and providing additional sources of prey along the Wallops Island shoreline. Given the small area affected by the proposed activities relative to abundant adjacent habitats, the relatively rapid recolonization of benthic prey organisms, and the ability of fish to exploit food sources over a large area, these effects would be minor and discountable.

Beach renourishment substantially impacts the native infauna and epifauna, and the consequences range from short term within renourishment areas to permanent underneath the breakwaters. In the nearshore area of Wallops Island, the placement of sand for beach nourishment can cause a smothering effect, likely to result in the loss of some immobile benthic species within EFH areas. The loss of these benthic invertebrates would create a loss of prey for local wildlife, including some managed fish species. This is expected to cause only a temporary reduction in prey, as the area is expected to become repopulated by benthic organisms from neighboring areas within approximately two to five years (NASA 2013). The placement of fill would bury existing benthic habitat, therefore reducing its foraging value for a period of time ranging from several months to a year following placement. Additionally, elevating the beach from intertidal to sub-aerial (dry beach) would immediately reduce the availability of in-water habitat; however, the area would return over time as the beach erodes (NASA 2013).

Consequences to onshore and intertidal infauna and epifauna range from short term to permanent and studies reviewed in preparing the *Final SRIPP PEIS* indicated that filled beaches can be devoid of living benthos for up to a year following project completion. Because the proposed action area was renourished in the past, the biological community of onshore and intertidal infauna and epifauna were previously impacted during those past actions. The immediate baseline condition is therefore currently degraded relative to adjacent non-renourished beaches, or relative to the pre-intervention conditions at Wallops Beach.

The disturbance of bottom sediments associated with offshore dredging could interfere with feeding, predation, and avoidance patterns of fish species. However, any adverse effects such as increased turbidity or loss of benthic prey would be limited to the vicinity of the dredging and temporary. While the offshore Unnamed Shoal A dredged area may not have fully recovered to previous pre-dredge conditions, at least some recovery of benthic communities is expected given the time elapsed. Recovery rates vary by taxonomic group, with polycheates and crustaceans recolonizing relatively quickly (within several months), while deep-burrowing mollusks may require several years (NASA 2018). Considering these documented recovery periods and the years that have passed since dredging, it is reasonable to expect that the benthos in the affected area have recovered to some degree considerably. It can be expected that benthic habitats would again recover post-project as they have done for previous dredge events.

Effects on benthos living nearshore and onshore would include bottom disturbance from the construction of the breakwaters. Construction of breakwaters would take place in the water using a barge and heavy lifting equipment resulting in a build-up of sediment along the shoreline perpendicular to the breakwaters. Since the location of breakwater construction is directly in water, elevated turbidity could potentially affect marine benthos in the construction area. Direct mortality of benthos directly located within the footprint of breakwater construction would be expected; however, the actual footprint of breakwater construction is small. Potential direct benefits to native benthos would be minimal, but the breakwaters would provide attachment points for sessile creatures, as well as refuge and cover for mobile

macrobenthos, such as polychete worms or amphipods and could offer some minor beneficial effects in the long term (NASA 2018).

Repair and extension of the seawall would result in a direct and permanent adverse effect on the local benthic community within the immediate footprint of the seawall. The construction of the seawall extension would bury sandy, sub-tidal benthic habitat and replace it with hard substrate. The benthos within the construction limits of the seawall would not be covered with rock. However, the seawall would have a minor effect on the benthic community within the region as the footprint of the structure is small compared to the overall available area of similar unconsolidated sediment throughout the nearshore shelf.

4.4 OTHER ELEMENTS OF ESSENTIAL FISH HABITAT

Although use of the term HAPC pre-dates the Magnuson-Stevens Act, HAPCs are now defined as subsets of EFH that exhibit one or more of the following traits: rare, stressed by development, provide important ecological functions for federally managed species, or are especially vulnerable to anthropogenic (or human impact) degradation. They can cover a specific location (a bank or ledge, spawning location) or cover habitat that is found at many locations (e.g., coral, nearshore nursery areas, or pupping grounds) (NOAA Fisheries 2025b).

HAPCs are designated through action by the regional FMCs and do not convey additional restrictions or protections on an area—they focus increased scrutiny, study, or mitigation planning compared to surrounding areas because they represent high-priority areas for conservation, management, or research and are necessary for healthy ecosystems and sustainable fisheries. Councils may include action to restrict the use or possession of fishing gear types within HAPCs, and the geographic boundaries are subject to refinement through amendments, as research better informs management decisions. In some cases, Councils may work together on HAPC designations, such as the Gulf and South Atlantic Councils collaboration on Coral and Coral Reef HAPC (NOAA Fisheries 2025b).

In the Mid-Atlantic region, NOAA and the Mid-Atlantic Fishery Management Council (MAFMC) have designated a HAPC for summer flounder *(Paralichthys denatus*) **(Figure 4-1)**. Amendment 12 to the *Summer Flounder FMP* defines this HAPC as a habitat "type" rather than a discrete area with boundaries. The specific designation of HAPC for summer flounder is as follows (MAFMC 1998b): "All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH is HAPC. If native species of SAV are eliminated then exotic species should be protected because of functional value, however, all efforts should be made to restore native species." These SAV habitats, when present in estuarine and high-salinity lagoonal systems such as Chincoteague Bay, provide important cover and foraging habitat for juvenile fish throughout the entire Mid-Atlantic region (MAFMC 1998b).

The boundaries of this HAPC extend along most of the coastline of the eastern U.S. This HAPC is large and is meant to include any SAV beds within estuarine and nearshore environments that function as crucial nursery habitat for summer flounder. SAV is typically described as rooted, vascular, flowering plants that, except for some flowering structures, live and grow below the water surface. In areas where SAV is absent, for example Delaware Bay, macroalgae can serve the same ecological function. The MAFMC identified SAV and macroalgae beds as HAPC because of its ecological importance as shelter from predators, as well as its use in predation. SAV is also recognized as refugia for juvenile and adult summer flounder, and can be important habitat for spawning summer flounder, important for prey of juvenile and possibly adult flounder (MAFMC 1998b).

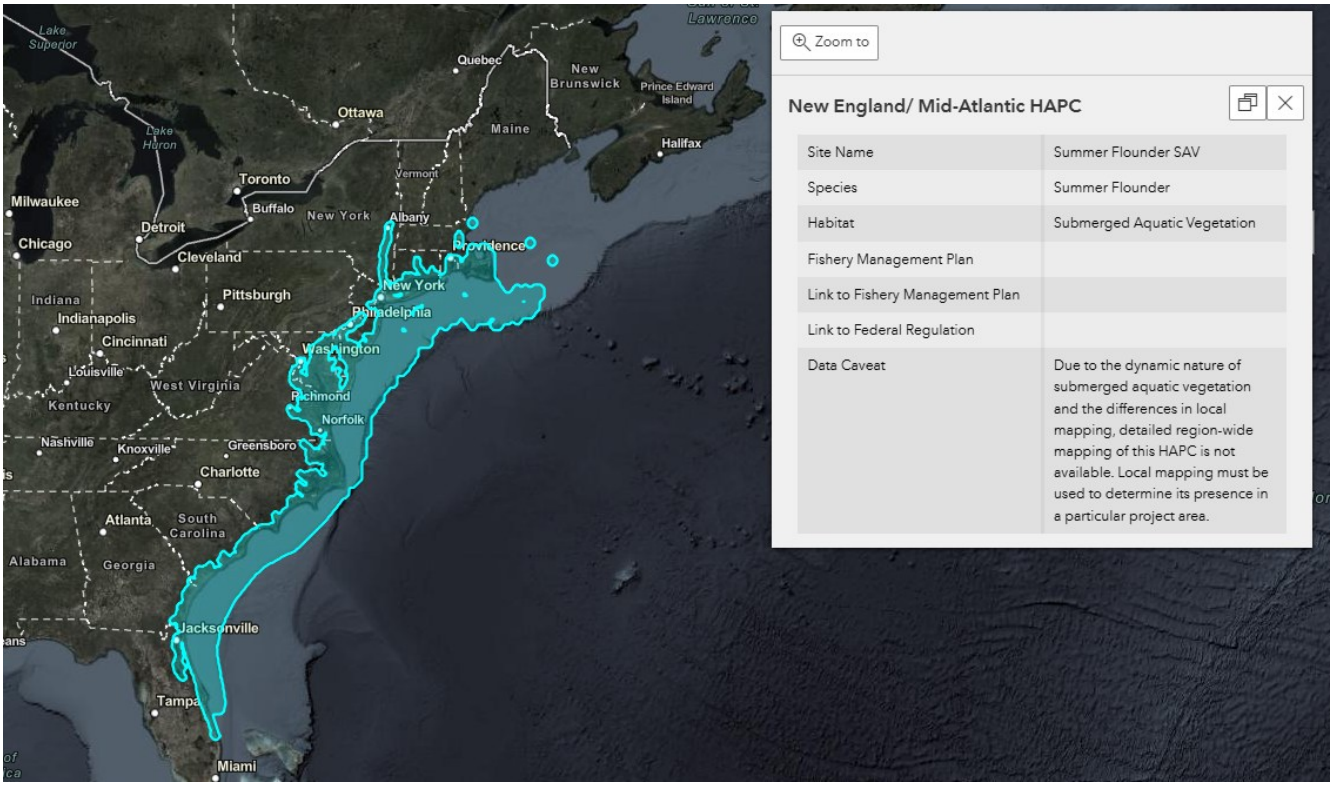

Figure 4-1 Summer Flounder EFH (Source: Addendum XXXV to the Summer Flounder, Scup, and Black Sea Bass Interstate Fishery Management Plan, October 2024)

Due to the dynamic nature of SAV and the differences in local mapping, detailed region-wide mapping of this HAPC is not available. Local mapping must be used to determine its presence in any particular localized area. Based on localized William and Mary's, Virginia Institute of Marine Science (VIMS) mapping, no SAV, or other HAPCs, are within the project area (Figure 4-2).

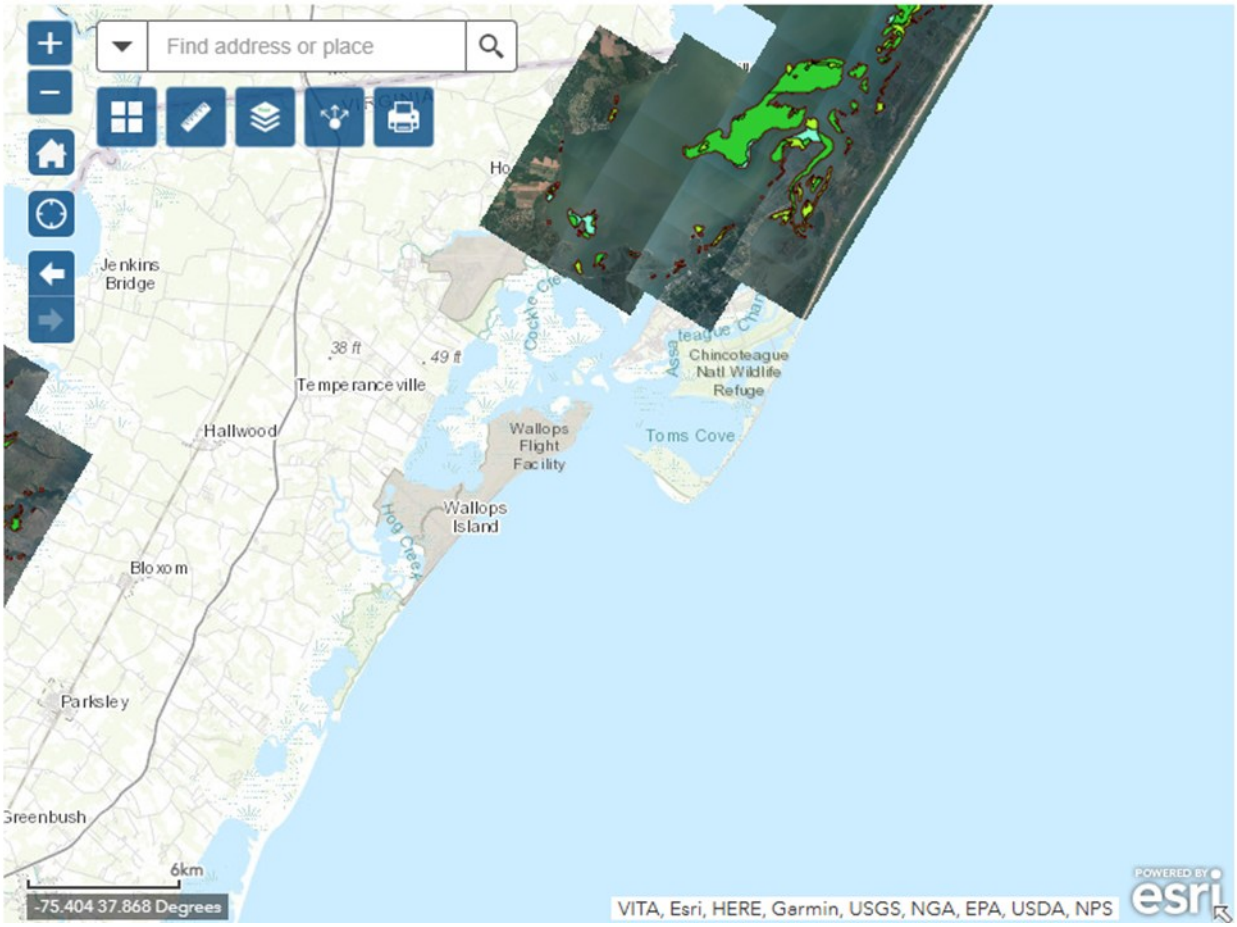

Figure 4-2 VIMS Interactive SAV Mapping (Source: https://www.vims.edu/research/units/programs/sav/access/maps/, February 2026)

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5.0 CONSEQUENCES TO EFH FUNCTIONS AND VALUES

5.1 DIFFERENTIAL CONSEQUENCES TO ESSENTIAL FISH HABITAT FUNCTIONS AND VALUES

All of the Alternatives would introduce stressors to EFH relatively evenly, and any differential consequences would be small. Construction activities on the beach and inshore habitats, and offshore dredging at Unnamed Shoal A, exposes EFH to intense and highly localized stressors.

Elevated turbidity in marine waters would occur during and immediately after beach renourishment and construction activities in the nearshore environment. There would be short-term, site-specific adverse effects on fish habitat within the fill placement areas due to temporary burial of existing benthic habitat and increased levels of turbidity during and immediately after sand placement.

Adverse effects within the dredged area would include removal and modification of benthic assemblages upon which managed species feed and an increase in water turbidity and sedimentation. Of these effects, the duration would be temporary in nature, with turbidity on the order of hours and benthic recovery on the order of several seasons. For any demersal species, there is also a possibility that it may become entrained in the dredge. However, no permanent effects to the species are anticipated.

Shoal topography modification can also be expected to a degree. As in previous dredge events, dredging the borrow area would again create steeply sloped areas of micro-topography which would be smoothed by tidal and wave energy in the years following the dredge event. The lowering of the shoal's topography would be a longer-term effect, with the shoal maintaining the same general morphology but at a lower elevation and different profile. For SRIPP, the total dredged volume in 2012 was 3,648,721 cubic yards. Measurements taken preceding each dredge event in 2012 and 2014 showed an accretion volume change of 238,249 cubic yards. Shoal topography is expected to continue recovery as infilling occurs from wave action and currents. Additionally, the use of a draghead screen to preclude the uptake of unexploded ordnance would also cause larger material to be screened from uptake and left on the bottom, potentially resulting in some "hardening" of the sediments (the standard size for MEC screens typically required aboard hopper dredges is 1.25 inches by 6 inches).

EFH would be temporarily affected by the localized increase in turbidity during construction activities. However, because the regional coastline has very little hardbottom habitat in the surf zone, the potential direct benefits to designated EFH or managed species would be minimal. Water column and benthic unconsolidated sediment EFH may be adversely affected by turbidity and water quality stressors and by physical strike and disturbance stressors. Any adverse effects due to increased turbidity and decreased dissolved oxygen in the water column would be minor and short-term.

EFH may also be temporarily affected from the use of construction vehicles and heavy machinery on the beach for seawall construction. Equipment could generate elevated turbidity, causing temporary disturbance and displacement of marine fisheries from local habitats. Temporary disruption of benthic habitat would occur during the proposed construction activities, affecting prey availability to certain fish species. Construction-related effects would be temporary and would not likely be adverse because any accidental release of contaminants or liquid fuels would be addressed in accordance with the existing WFF Integrated Contingency Plan emergency response and clean-up measures. Implementation of best management practices for vehicle and equipment fueling and maintenance, and spill prevention and control measures, would reduce potential effects on nearshore waters and EFH during construction.

5.1.1 SPAWNING

No differential consequences to spawning functions would be expected under any alternative.

5.1.2 NURSERY

No more than minimal impacts to nursery functions would be expected under any alternative. The main exposure to project-related stress would be temporary as organisms transit the project area.

5.1.3 FORAGE

Differential consequences to forage value could impact sight-reliant feeders. However, adverse impacts are expected to be no more than minimal, temporary, and highly localized under any alternative.

5.1.4 SHELTER

No differential consequences to shelter functions would be expected under any alternative. Creation of breakwaters would create some new shelter area, but because the regional coastline has very little hardbottom shelter habitat in the surf zone the potential direct benefits of enhanced shelter would likely be minimal.

5.2 DIFFERENTIAL CONSEQUENCES TO MANAGED SPECIES

Managed fish species in the nearshore waters of Wallops Island may be temporarily affected by turbidity, vessel traffic/presence, and dredging activity. Relatively few differential consequences to managed species would be expected as most managed species are highly mobile and should be able to quickly avoid affected areas. In many other aspects, the area affected is not differentially valuable to managed species (e.g., the area is shallower than preferred or offers unsuitable shelter). Many neonate/early juvenile life stages of managed species tend to congregate in nearby estuaries; therefore, temporary differential impacts would be possible as the fish transit the project area. Differential impacts to forage habitat quality would be possible, but adverse impacts are expected to be temporary and highly localized. Dredging at the offshore Unnamed Shoal A would have differential consequences to all demersal managed species (such as sharks). Motile fish species would be temporarily displaced from the dredge area and project footprint during construction and in the long term in the area where the breakwaters are constructed. Recovery could begin almost immediately after completion of the action. Most motile fish species are attracted to structures, and the breakwaters would likely cause localized increases in fish density, but potential direct benefits to native fishery species and EFH would be minimal.

5.3 OVERALL CONSEQUENCES TO ESSENTIAL FISH HABITAT

Construction activities would result in temporary adverse effects to EFH within the region. Water column and benthic unconsolidated sediment EFH may be adversely affected by turbidity and water quality stressors and by physical strike and disturbance stressors. The main temporary impact of turbidity stressors is to water column EFH functions and values for sight-reliant organisms (e.g., feeders and predator escape). However, adverse impacts are expected to be temporary and highly localized.

Overall**,** adverse impacts to EFH would be no more than minimal because the consequences of turbidity and water quality stressors would be minimal and temporary to short term. Adverse impacts of benthic habitat disturbance would be long-term or permanent, but no more than minimal because the consequences affect a negligible portion of EFH in the region and because most of the affected area is small and would remain available to the same suite of organisms. Historically, previous EFH

consultations for similar activities concurred would not substantially adversely affect EFH. Under each alternative, EFH is not expected to be affected to the point of substantial loss of any protected species and would not have adverse effects to the EFH in the proposed project area due to the localized and short-term nature of the Proposed Action. Most motile fish species would be displaced without injury or mortality, and the probability of large-bodied animals being entrained is low. The overall magnitude of consequences to EFH is expected to be minimal, temporary, and localized.

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Appendix A
Beach and Breakwater Fill Design

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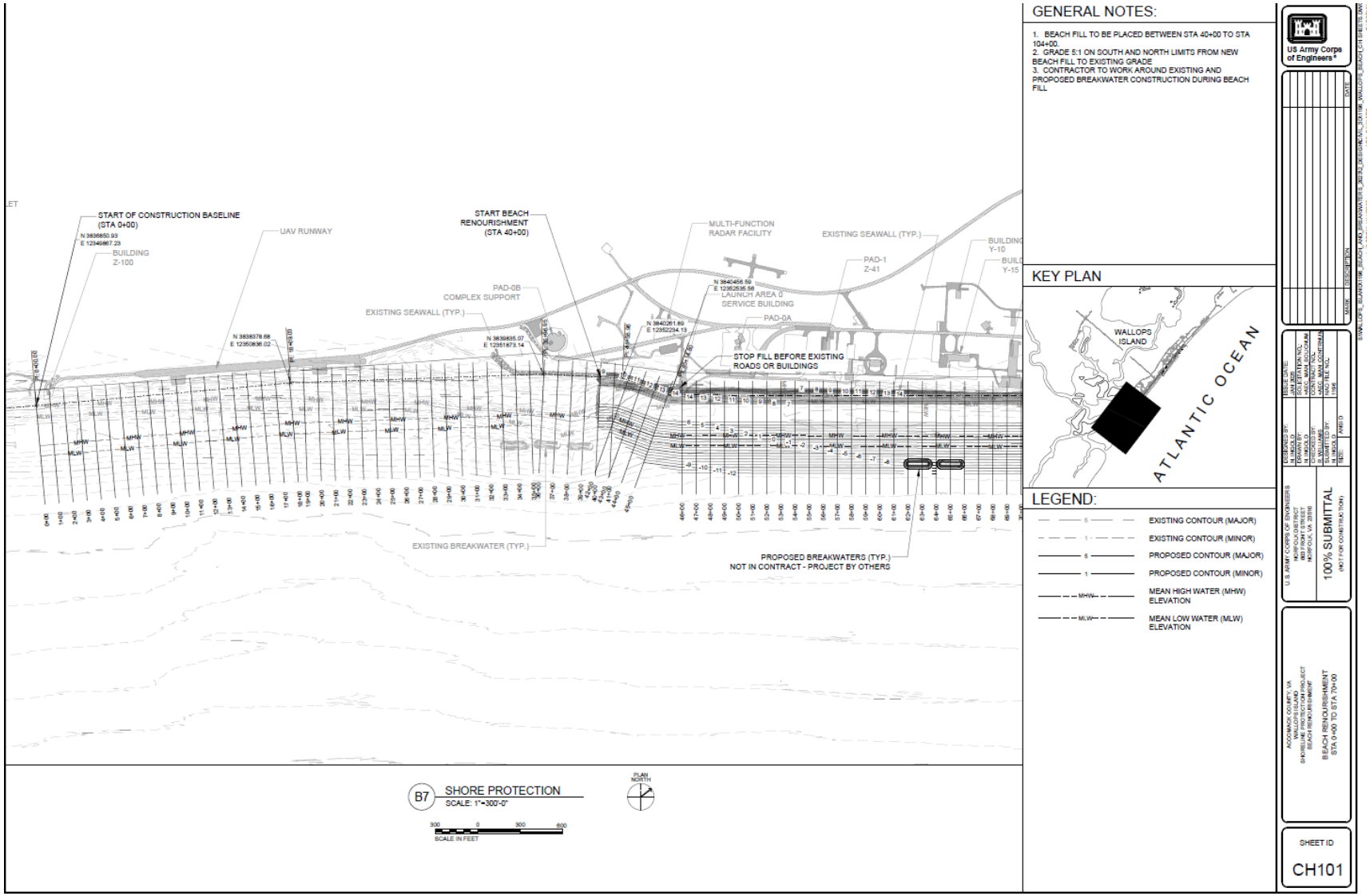

Figure 1 Beach Plans A

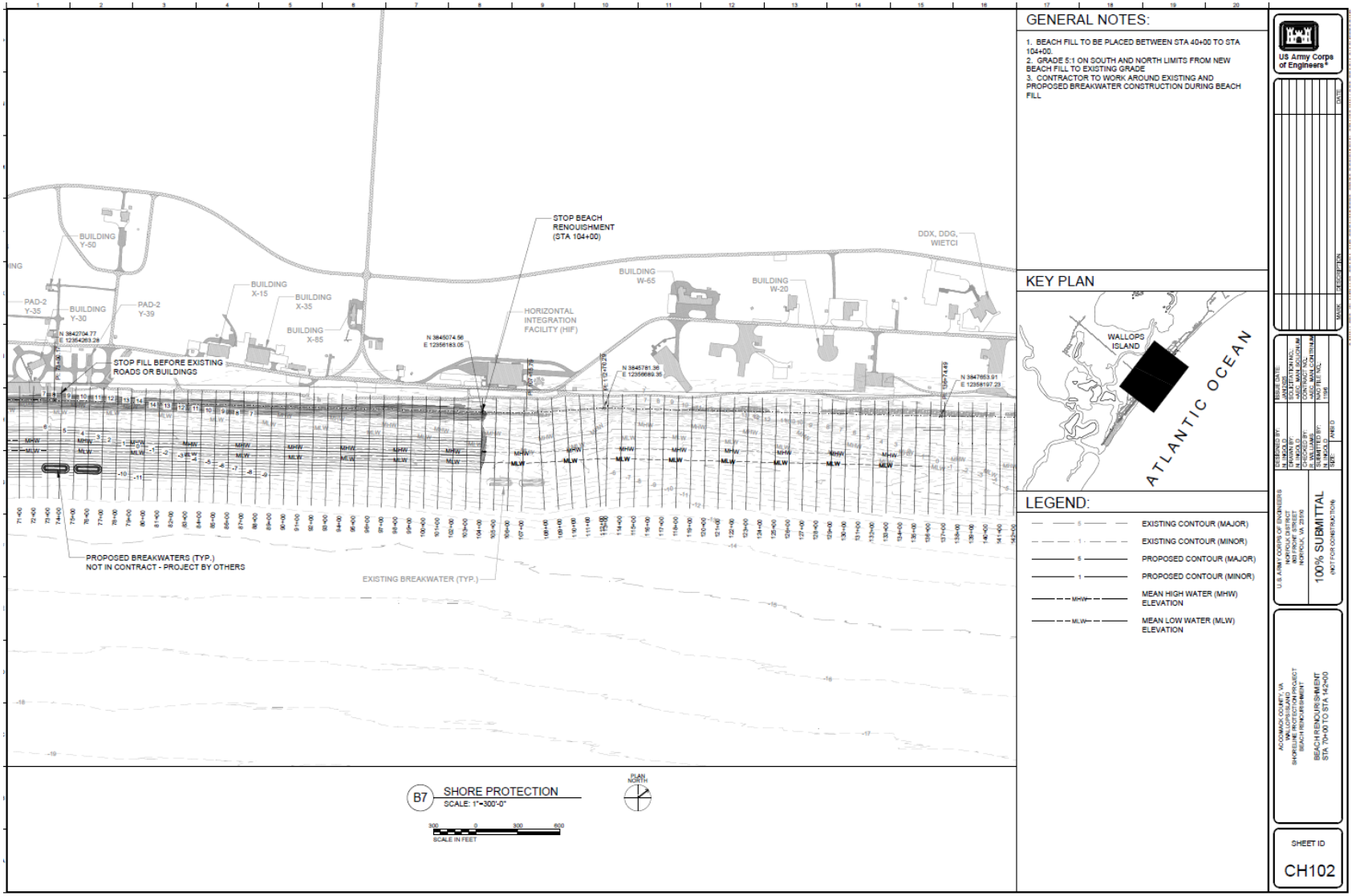

Figure 2 Beach Plans B

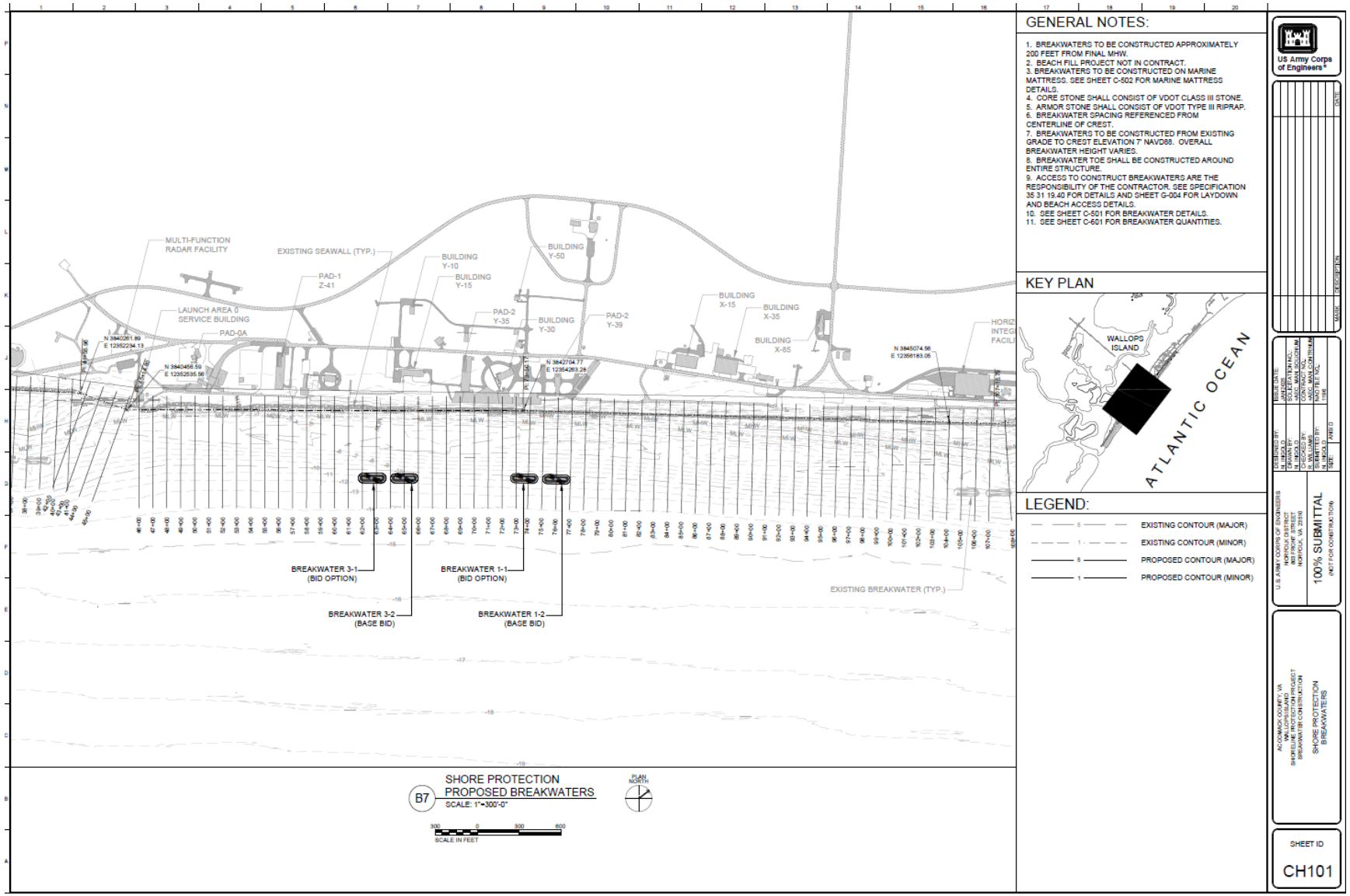

Figure 3 Breakwater Plans A

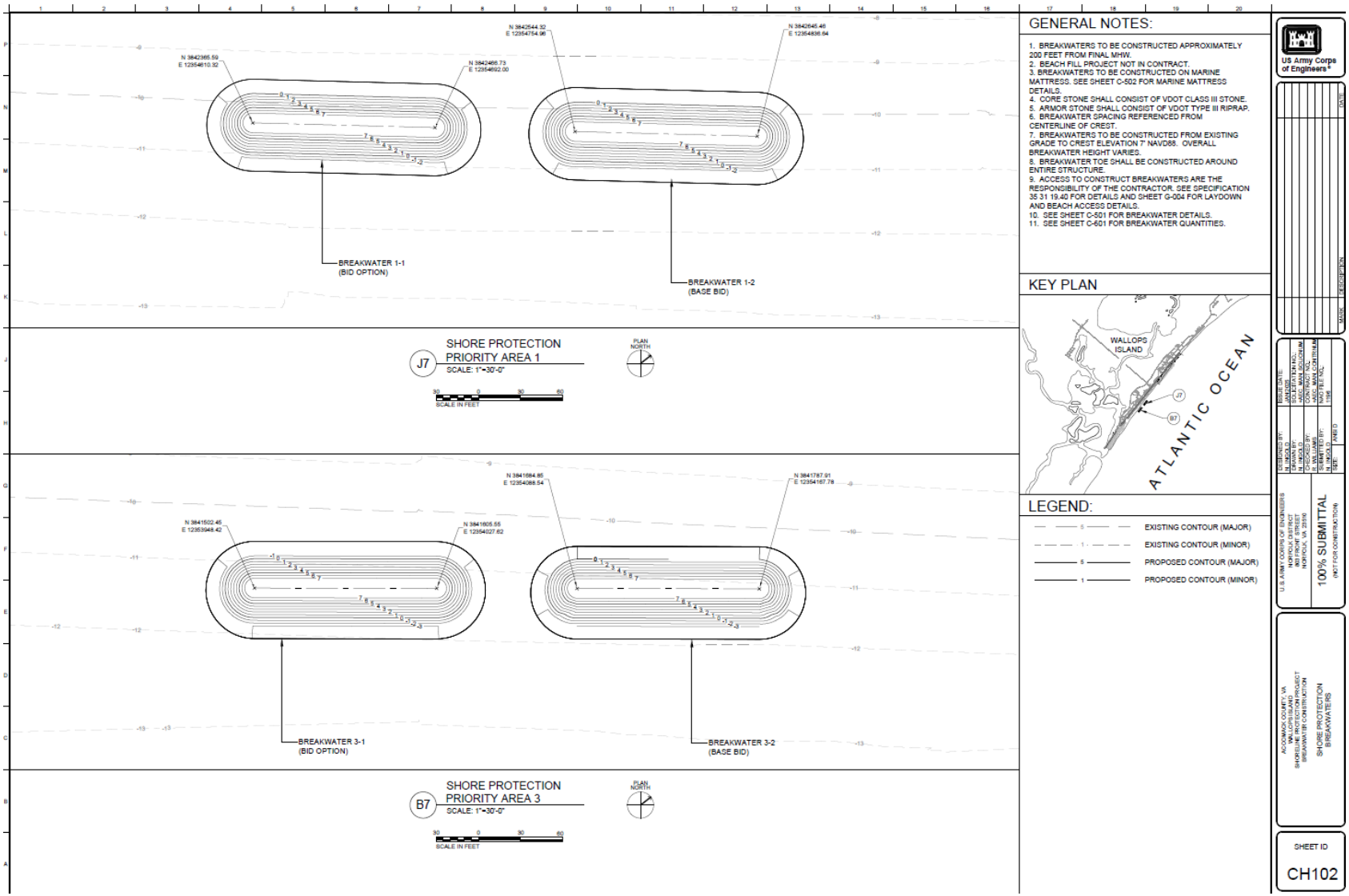

Figure 4 Breakwater Plans B

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

April 17, 2026

Ms. Lori Levine
Medical & Environmental Management Division
National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

RE: Wallops Island 50-year Shoreline Protection Program; Revised EFH Assessment

Dear Ms. Levine:

We have reviewed the revised essential fish habitat (EFH) assessment emailed to us on March 17, 2026, for NASA's Wallops Island 50-year Shoreline Protection Plan. We requested the revised assessment to address shortcomings of the draft assessment we outlined in our letter of February 17, 2026. The revised assessment provides sufficient information for us to initiate consultation with you under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Previous shoreline protection activities at Wallops Island include the initial beach nourishment (3.2 million cubic yards) completed in August 2012 and repairs to the seawall and a second beach nourishment (650,000 cubic yards) completed in September 2014. Sand material for both events was hydraulically dredged offshore at Unnamed Shoal A, transported by hopper barge and pumped ashore. Subsequent storms reduced sand placed during the 2014 nourishment cycle by over a million cubic yards. A third nourishment action of 1.1 million cubic yards of sand excavated from the northern beach of Wallops Island was undertaken in 2020-2021 along with the construction of five detached breakwaters aligned approximately 200 ft. offshore (MHW) to help slow sediment transport. The 50-year shoreline plan includes the construction of up to six additional breakwaters, repairs to and/or extension of the existing seawall, offshore sand mining at Unnamed Shoal A, and the placement of sand fill along approximately 15,000 linear ft. (2.84 miles) of oceanfront shoreline. The breakwater and beach profile designs are similar to those previously reviewed under the *Final Post-Hurricane Sandy EA* (NASA 2013) and *Final Shoreline Enhancement and Restoration Project EA* (NASA 2019).

Magnuson Stevens Fishery Conservation and Management Act (MSA)

As we stated in our previous letter, the entire project area, including Unnamed Shoal A and the Wallops Island shoreline, is designated as EFH for various life stages of 27 federally managed species. As you know, the MSA requires federal agencies such as NASA 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.

As the lead federal agency for this project, NASA has requested EFH consultation. Based on our review of the revised EFH assessment for the 50-year Shoreline Protection Program, our comments and EFH conservation recommendations are provided below.

Alternatives for Beach Renourishment and Breakwater Construction

Several alternatives are discussed in the assessment to help protect over 2.8 miles of the Wallops Island shoreline: Alternative 1: beach nourishment and breakwater construction (up to six); Alternative 2: beach nourishment and seawall repair/extension (3,170 ft.); and Alternative 3: breakwater construction and seawall repair/extension (3,170 ft.). Each alternative includes periodic monitoring "*to be conducted as funding allows*." The two alternatives proposing beach renourishment use Unnamed Shoal A, previously used for the two initial beach fills (2012 and 2014). Unnamed Shoal A is located approximately five miles east of Assateague Island and would be mined using a trailing suction hopper dredge. Dredge material would then be transported via the vessel to a location approximately two miles offshore for hydraulic transfer to the beach where the sand will be distributed via heavy construction equipment (bulldozers). Best management practices (BMPs) to be employed during operation of the trailing suction hopper dredge are outlined in the assessment.

The assessment estimates that up to 50% of dredged sand will be lost due to "*overflow from the hopper dredge at the borrow site during dredging and losses during discharge and placement*." The beach nourishment alternative states that approximately six million cubic yards of material will need to be dredged to obtain three million cubic yards of sand. We note that this inefficiency, occurring during each maintenance event, will essentially double the environmental impacts from sand mining. This is significantly more material than the renourishment component that is described in the 2010 *Shoreline Restoration and Infrastructure Protection Program (SRIPP) EFH Assessment* and *Final PEIS* that estimated approximately 806,000 CY of dredge material would be required every three to seven years.

In addition to the alternatives that include offshore sand mining and beach renourishment, NASA may construct up to six new breakwaters approximately 200 ft. offshore which would vary in height based on bathymetry. Each breakwater would fill 16,000-18,000 sq. ft. of subaqueous bottom habitat totaling approximately 108,000 sq. ft. (2.47 acres)-. The assessment states *"the specific size, number, and placement of breakwaters would be a function of available funding, local conditions, and modeling by the USACE to determine maximum effectiveness and minimizing impacts to sediment transport and hydrodynamics in the project vicinity.*" Loss of the existing benthos and EFH will occur within the 2.47 acre footprint of the stone breakwaters.

Magnuson-Stevens Act Conservation Recommendations

As we have previously stated, the project area is designated as EFH for various life stages of 27 federally managed species. Section 305(b)(2) of the MSA requires you to consult with us on any action you authorize, fund, or undertake that may adversely affect EFH. As proposed, the

Wallops Island 50-year Shoreline Protection Plan will adversely affect EFH. Therefore, pursuant to 305(b)(4)(A) of the MSA, we recommend the following EFH conservation recommendations:

1. Based on historic and recent bathymetric survey data, target accretion areas of Unnamed Shoal A, sub-area A-1 for mining beach fill material, as proposed in the assessment.
2. Dredge over a large area, leaving undisturbed areas between dredged areas to provide for benthic recruitment and recolonization of impacted areas and avoid creating deep pits; follow the existing bathymetry/morphology of shoal to the extent possible; limit depth of cut not to exceed 10 ft. and confirm by conducting post-dredge survey, as proposed in the assessment.
3. Conduct bi-annual post-dredge monitoring of the accretion area of Unnamed Shoal A, sub-area A to determine the recovery rate of sand resources.
4. To reduce the turbidity plume around the trailing suction hopper dredge and to reduce the need for 100% over-dredge, 'overflow' should not be used to fill the hopper with more sediment/less water. Do not fill the hopper dredge beyond the maximum hopper capacity or use 'overflow' to maximize the percentage of sand in the dredge slurry for transport. Adequate freeboard should be always maintained to avoid inadvertent loss of slurry material to surrounding waters.

Provided the conservation recommendations listed above are accepted and implemented into the project, we concur with your determination that the Wallops Island 50-year Shoreline Protection Plan will not substantially affect essential fish habitat (EFH) adversely.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with written response to these EFH conservation recommendations including a description of measures you have adopted that avoid, mitigate or offset the impacts of the project on EFH. In the case where your response is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must provide reasons for not following our recommendations. Included in your response should be the scientific justification for your disagreement over the anticipated effects of the proposed project and the measures necessary to avoid, minimize, mitigate or offset such effects pursuant to 50 CFR 600.920(k). If new information becomes available or the project is revised in such a manner that affects the basis for our EFH conservation recommendations, consultation must be reinitiated with us pursuant to 50 CFR 600.920(1).

Endangered Species Act (ESA)

Endangered species under the jurisdiction of NOAA Fisheries may be present in the project area. The federal action agency is responsible for determining whether the proposed action may affect these species. If you determine that the proposed action may affect a listed species, your determination of effects along with justification and a request for concurrence should be submitted to the Section 7 Program email account at nmfs.gar.esa.section7@noaa.gov. Guidance and tools to assist you in your effects determination are available on our website at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultations-greater-atlantic-region. Please contact our Protected Resources Division if you have any questions or to discuss your project and obligations under Section 7 of the Endangered Species Act (ESA).

Conclusion
Thank you for providing the revised EFH assessment to address our previous comments. Please feel free to contact Mr. David O'Brien in our Virginia field office at 804-684-7828 (david.l.obrien@noaa.gov) if you have any questions regarding our recommendations.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat and Ecosystem Services

Cc: Shari Miller, NASA WFF
Nicole Woodward, USACE

National Aeronautics and Space Administration

Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

Reply to Attn of: 250.W

May 18, 2026

Louis A. Chiarella
Assistant Regional Administrator for Habitat and Ecosystem Services
Protected Resources Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Mr. Chiarella:

This letter provides clarification regarding the requested mitigations and dredge loss estimates detailed in our Essential Fish Habitat (EFH) Assessment for the proposed Wallops Island 7-year Shoreline Protection Plan, pursuant to Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

In our Draft Environmental Assessment (EA) and EFH Assessment for this project, NASA used an estimated 50-percent dredging loss to calculate maximum potential impacts. However, the U.S. Army Corps of Engineers (USACE) and the Bureau of Ocean Energy Management (BOEM) have since clarified that this 50-percent figure represents a contingency volume and does not represent the anticipated losses on the project. This volume is set aside for dredger efficiency, potential additional fill requirements within the beach placement area, and/or to account for any additional unforeseen circumstances that could arise and require additional volume. The actual anticipated maximum loss for the project is 20 percent, which is based upon geotechnical boring information. The project borings indicate there are predominantly sands within the borrow site which will have a lower loss rate than finer sediments. We also confirm that over the 7-year life of the project, NASA would not dredge beyond the 4.5 million cubic yards analyzed in the EA and EFH Assessment.

Additionally, we would like to address the concern that hoppers might be overflowed or filled beyond maximum capacity to avoid losses during transport. When a trailing suction hopper dredge pumps material from the shoal, the resulting slurry is typically 25 percent solids and 75 percent water. To maximize the volume of sand transported per trip, sediment is allowed to settle in the hopper via a system of weirs. The weirs increase hydraulic retention time and allow for the water to clarify and for sediment to settle out. The clarified water then flows over the weirs and back into the water body. Although some sediment overflow is inherent to this process, allowing the material to settle to maximize economic loading significantly reduces the total number of required transport loads. This efficiency decreases overall operating time and minimizes environmental impacts, including fuel consumption, emissions, and potential interactions with endangered species.

Furthermore, the risk of excessive sediment overflow and resulting turbidity is low on this project due to three primary factors:

- Material Composition: Borings indicate that the targeted dredge material is predominantly sand. Unlike finer sediments, sand settles rapidly within the hopper and does not easily suspend in the water column if overflow occurs.
- Active Monitoring: Project specifications require the contractor to submit operational calculations and participate in monitoring via the Dredge Quality Management program. This ensures early detection if unnecessary overflowing begins to occur.
- Economic Incentives: The contract is structured to pay based on the volume of material successfully retained on the beach, not the volume dredged from the borrow site. This provides the contractor with a strong financial incentive to maximize retention, reduce dredging time, and avoid the inefficiencies of material loss through excessive overflow or overfilling the hopper.

If you have any questions or require additional information, please contact me at (301) 286-6741 or lori.m.levine@nasa.gov.

Sincerely,

Lori Levine
Environmental Management Division

cc:
228/W. Harris
228/J. Saecker
250/B. Deyo
250/S. Miller
250/I. Romero
BOEM/L. Brandt
BOEM/J. Bucatari
NOAA/B. Hopper
NOAA/D. O'Brien
USACE/M. Wood
USACE/S. Williams

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Appendix E
Endangered Species Act Consultation with USFWS

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National Aeronautics and Space Administration

Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

Reply to Attn of: 250.W

February 26, 2026

Troy Anderson
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061

Dear Mr. Anderson:

This correspondence serves as the National Aeronautics and Space Administration's (NASA's) notification to the United States (U.S.) Fish and Wildlife Service (USFWS) of its proposed Shoreline Protection Program (SPP) at Wallops Flight Facility (WFF), Wallops Island, in Accomack County, Virginia. This project may be implemented in phases over the next 7 years. It tiers to NASA's 50-year Shoreline Restoration and Infrastructure Protection Program (SRIPP).

NASA's shoreline protection efforts are necessary to protect Wallops Island's critical infrastructure including NASA, U.S. Navy, Department of Air Force, and Virginia Space Authority assets, allowing WFF to continue its mission. To date, there have been three shoreline protection projects: beach renourishment in August 2012 using sand from offshore shoal; post-Hurricane Sandy beach renourishment in September 2014 using sand from offshore shoal; and a third beach renourishment using sand mined from the north Wallops Island beach as well as breakwater construction in 2021. The current Proposed Action is to perform additional beach renourishment, breakwater construction, and to repair and extend the existing sea wall.

Currently, most of the shoreline adjacent to these assets (referred to as the infrastructure protection area), is protected by a seawall. East and adjacent to portions of this rock seawall there is extensive beach erosion and no beach exists at high tide. North of the seawall, the beach is accreting sand, including the area previously mined for sand. South of the seawall, the beach is narrow with the exception of where it has been stabilized by breakwaters. **Figure 1** illustrates the beach in 2023.

The U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) and the U.S. Army Corps of Engineers (USACE) are serving as cooperating agencies on this project based on their statutory authorities. USACE has oversight of the placement of fill material in Waters of the U.S. under Section 404 of the Clean Water Act and placement of structures in navigable waters of the U.S. Section 10 of the Rivers and Harbors Act. BOEM has oversight of mineral resources of the federal outer continental shelf under Section 8(k)(2)(d) of the Outer Continental Shelf Lands Act. NASA has assumed the role of Lead Federal Agency for Endangered Species Act (ESA) Section 7 compliance and both BOEM and USACE are participating in NASA's ESA consultation. The effects of their actions are considered in this correspondence.

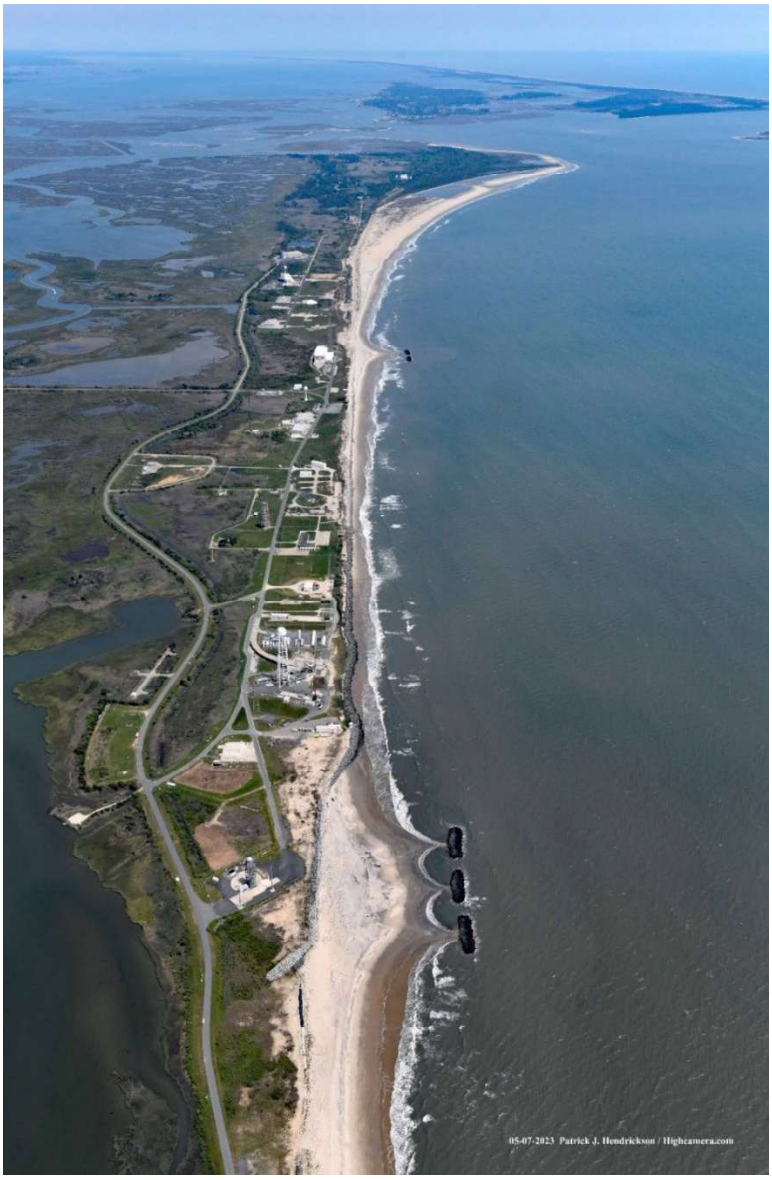

Figure 1 Wallops Island Infrastructure Protection Area in 2023

NASA requests USFWS concurrence that the action currently proposed is substantially similar to those considered previously (in the SRIPP Biological Assessment [BA], 2010 Programmatic Biological Opinion [BO], 2016 BO, and 2019 Programmatic BO, 2021 Project Modification, and 2024 Letter of Concurrence [LoC]) and that these actions may affect and are likely to adversely affect piping plovers, red knots, and loggerhead sea turtles. Further, because the actions are substantially similar in scope and geography, and have similar effects to the same listed species, NASA requests to update its incidental take statement to reflect this Proposed Action, which would be implemented in phases over the next approximately 7 years. NASA would continue to follow all shoreline restoration and protection provisions of the 2019 Programmatic BO and 2021 Project Modification related to avoidance and minimization measures, reporting, and USFWS coordination.

1.0 History of Shoreline Work at Wallops Island

1.1 Shoreline Restoration and Infrastructure Protection Program

On December 13, 2010, NASA issued a Record of Decision (ROD) for the WFF SRIPP Programmatic Environmental Impact Statement (PEIS; NASA 2010a). The PEIS assessed several options that could be employed to protect the Wallops Island Shoreline over the following 50 years, during which nine beach renourishment cycles were anticipated at approximately 5-year intervals. In its ROD, NASA selected beach fill and seawall repair and extension (up to 4,600 feet). The total volume of sand required over the project lifetime is estimated to be 7,254,000 cubic yards (excluding the amount required for the initial beach and dune reconstruction) sourced from Unnamed Shoal A, Unnamed Shoal B, or north Wallops Island beach.

1.1.2 Consultation

NASA consulted formally with USFWS (NASA 2010b). Its BA concluded that proposed activities would have the following effects on species managed by USFWS:

- May affect, not likely to adversely affect seabeach amaranth (threatened) and red knot (candidate);
- May affect, likely to adversely affect piping plover (threatened) and loggerhead sea turtles (threatened); and
- No effect on nesting leatherback sea turtles (endangered), Kemp's ridley sea turtles (endangered), or Atlantic green sea turtles (threatened) based on lack of nesting (within the jurisdiction of USFWS) on Wallops Island.

USFWS issued a Programmatic Biological Opinion (PBO) on July 30, 2010 (USFWS 2010), which concluded that the proposed activities, including initial renourishment, seawall extension, and subsequent renourishments over 50 years were not likely to jeopardize the continued existence of any species or critical habitat (p58). Specifically, it stated that the initial renourishment and seawall repair and 4,600-foot extension would have the following effects on species:

- No sea turtle nesting is expected in the vicinity of the 4,600-foot seawall extension (p45);
- Nesting sea turtles could be disturbed by renourishment activities on the beach (p46);
- Effects to seabeach amaranth were considered unlikely because the species and its habitat is not present in the project area (p45 and 46); and
- No determination was made for red knot as it was not proposed for listing at the time of the consultation.

In terms of take, the BO anticipated the following from initial renourishment and seawall extension:

- No take of breeding piping plovers, nests, or eggs because of a lack of appropriate beach habitat in the action area;
- Incidental take of one post fledging piping plover from habitat loss, harassment, loss of prey;
- Take of one nesting female (injury or death) and loss of one unidentified nest during beach construction activities; and
- Take of up to seven additional nests through harassment and habitat effects.

1.1.3 Implementation

The initial phase of SRIPP included placement of approximately 3.2 million cubic yards of sand dredged from Unnamed Shoal A along the Wallops Island shoreline and a 1,430-foot (of the 4,600-foot allowable) southerly extension of the rock seawall.

1.2 Post-Hurricane Sandy Shoreline Repair

A second renourishment and repair to a section of the seawall was required after Hurricane Sandy made landfall in October 2012. NASA prepared the Post-Hurricane Sandy Shoreline Repair Final Environmental Assessment (EA) (NASA 2013).

1.2.2 Consultation

On February 25, 2013, NASA provided a letter to USFWS that contained a description of these proposed activities as well as updated data on protected species status from recent surveys. NASA concluded that the project was substantially the same as that considered within the SRIPP BA (NASA 2010b) and PBO (USFWS 2010), and therefore, reinitiating formal consultation is not necessary. NASA requested USFWS concurrence with this determination.

In a series of emails from March 2013, USFWS concurred with this determination and clarified that: "proposed seawall work is also covered by the PBO as long as it is confined to the areas defined in the SRIPP BA and PBO" (USFWS 2013).

1.2.3 Implementation

Repairs to the seawall and second beach renourishment of 650,000 cubic yards of sand were completed in September 2014.

1.3 Shoreline Enhancement and Restoration Project

Subsequent storms in 2015, 2016, and 2018 resulted in a reduction of over a million cubic yards of sand in the southern portion of the island as compared to after the 2014 shoreline repair (USACE 2018). In 2018, NASA requested the USACE Norfolk District Hydraulics and Hydrology Section evaluate the effectiveness of constructing breakwaters along the shoreline to reduce the intensity of wave action and the rate of sediment transport, since previous renourishments provided only temporary protection. NASA proposed to continue the SRIPP by implementing the Shoreline Enhancement and Restoration Project (SERP). NASA prepared an EA for the proposed project which included construction of six offshore parallel breakwaters and renourishment using sand mined from the north Wallops Island beach (NASA 2019).

1.3.2 Consultation

On December 14, 2018, NASA provided a letter to USFWS to seek its concurrence on the conclusion that impacts associated with the project were substantially the same as those considered in the SRIPP BA (NASA 2010a), 2010 PBO (USFWS 2010), and 2016 Consolidated BO (which was updated to account for changes in range operations; USFWS 2016). Specifically, the proposed renourishment and breakwater construction may affect, and would likely to adversely affect piping plovers, red knots, and loggerhead sea turtles. Note that the source of the sand for renourishment for this project was the north Wallops Island beach, where the majority of historic knot, plover, and loggerhead activity is located. Thus, the impacts assessment focused primarily on disturbance and loss of habitat in that area.

On June 7, 2019, USFWS issued an updated consolidated BO (USFWS 2019) for activities at Wallops Island by updating the 2016 BO (activities that have not changed) with the proposed SERP activities. The BO expires 15 years from the date of its signature. The 2019 BO:

- Carried forward shoreline activities from the 2010 BO including repair and 4,600 feet extension of the seawall and beach renourishment using up to 7,254,000 cubic yards of sand (p13).
- Concluded there would be no incidental take for seawall or breakwater construction.
- Concurred with NASA's likely to adversely affect determination for piping plover, rufa red knot, and loggerhead sea turtles.
- Concurred with NASA's may affect not likely to adversely affect determination (for all activities including breakwaters and operations) for northern long-eared bat, roseate tern, hawksbill sea turtle, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle, and seabeach amaranth based on the unlikelihood of presence in the action area. These species were not discussed further.

1.3.3 Implementation

Repairs included beach renourishment using approximately 1.1 million cubic yards of sand sourced from the north Wallops Island beach and construction of five breakwaters. These were proposed to be constructed using barges in two sets of three breakwaters each—one set in front of the Horizontal Integration Facility and the second set constructed south of these, in front of Launch Pad 0-B. During construction, however, three tropical storms/hurricanes caused delays and posed hazards to personnel and equipment on the barges, necessitating a modification to the proposed method of breakwater construction.

1.4 Modification of SERP Methodology and Timing

Because of risk to personnel and equipment on the barges during breakwater construction, NASA proposed to build the three southern breakwaters via temporary bulkheads constructed perpendicular to the shoreline. In a series of emails, NASA notified USFWS of this change in methodology and requested guidance on any effects to its 2019 BO. USFWS stated that there would be no additional effects to piping plover, red knot, or loggerhead.

Subsequently, piping plover nest buffer delays caused SERP to extend into an additional year. On March 10, 2021, the USFWS provided an amendment to the 2019 BO (USFWS 2019) by letter (USFWS 2021) which included incidental take statements for piping plover, red knot, and loggerhead associated with 5.5 linear miles of beach renourishment.

2.0 Current Proposed Action

The beach and dune system established to protect NASA's Wallops Island launch range infrastructure has continued to erode through storm wind and wave damage. The effects of storms are most apparent in the southern half of the Wallops Island beach, where the majority of the critical launch assets are located (referred to as the infrastructure protection area). As shown in Figure 1, there is essentially no beach above the high tide line adjacent to the existing seawall and a very narrow beach east of the seawall to the point where tombolos have formed to the existing sets of breakwaters.

Consistent with the previous proposed actions and consultations, NASA proposes to implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area.

The Proposed Action could involve a combination of the following, implemented in phases over the next 7 years (**Figure 2**):

- Dredging up to 4.5 million cubic yards of sand from Offshore Unnamed Shoal A;
- Sand renourishment within an approximately 15,000-foot section of shoreline;
- Construction of up to six breakwaters in the nearshore area between the existing breakwaters; and
- Repairs and extension (remaining 3,170 feet of the original 4,600 feet) of the existing seawall.

Figure 2 Project Area and Components

Activities would occur in phases depending on a number of factors, including infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. Existing mitigation measures and monitoring requirements would be unchanged (see **Section 2.5**).

2.1 Dredging

The beach along the Wallops Island shoreline infrastructure protection area would be renourished using sand sourced from Unnamed Shoal A. Dredging would be consistent with the previous projects. Offshore equipment would include several miles of discharge pipe, pump-out buoys, and multiple barges, tugboats, derricks, and smaller crew transportation vessels. The dredging process would be cyclical in nature, with the vessel transiting to the borrow site, filling its hopper, and transporting the material to a pump-out station (the floating end of a submerged pipeline) that would be placed at a water depth of approximately 30 feet, approximately 2 miles

offshore. Booster pumps may be needed to aid the offloading of sand from the pump-out buoy to the shoreline. The sand/water slurry would be pumped to the beach through several miles of submerged pipeline temporarily placed on the seafloor in areas previously cleared for cultural resources and/or on hardbottom. The dredging together with the beach renourishment portion of the project would take approximately 3 months

2.2 Beach Renourishment

Consistent with previous analyses, sand harvested from Offshore Unnamed Shoal A would be moved via slurry pipeline (positioned on the beach using front end loader) to the Wallops Island beach, where it would be discharged onto the shoreline and graded to the desired design template using bulldozers. Sand would be placed onshore along a maximum of 15,000 feet of beach extending from just north of the southern property line to the north near the fire station. The tidal cycle would influence the location on the beach within which the equipment would work for a given dredge load. After each section of beach is confirmed to meet design criteria, the process would continue in the longshore direction, with sections of discharge pipe added as it progresses.

2.3 Breakwater Construction

Breakwaters would be constructed offshore between the two existing sets of breakwaters. The optimal size and location of these breakwaters was determined using GenCade, a USACE Engineering Research and Development Center-developed shoreline model that simulates long-term shoreline evolution in response to longshore sediment transport induced by ocean forces such as waves, currents, and water level changes. The model accounts for the effects of structural (such as breakwaters) and nonstructural (such as beach renourishment) measures.

A GenCade model was developed to cover a 15-kilometer-long coastline from the northern end of Wallops Island to Assawoman Island. A separate 2-D coastal processes model, the Coastal Modeling System (CMS), was developed to simulate nearshore waves and currents in the coastal waters, providing the necessary inputs for GenCade to estimate longshore sediment transport. The GenCade shoreline model was validated by simulating shoreline changes over 5 years (2015–2020), driven by the historical data of waves and water levels combined with the CMS-simulated currents. Comparison with observed shoreline positions, using statistical error metrics, revealed that the model reproduced long-term shoreline changes in response to seasonal and interannual variations in the ocean forces. The simulated longshore transport indicated the existence of three distinct coastal regions on Wallops Island: a northern accretion region, a central erosion region (the project area), and a southern region transitioning from erosion to equilibrium. This validated model was then used to evaluate the long-term performance of erosion protection alternatives, including breakwaters and nourishment. Predictive simulations for 12 alternatives were conducted using a 5-year historical dataset of ocean forces. The results suggest that combining breakwaters with sand nourishment is more effective for erosion control than using breakwaters alone.

Modeled alternatives with breakwater sets constructed south of the existing breakwaters showed some effects to the adjacent shoreline including short-term localized erosion just south of the breakwaters followed by equilibration after 5 years. These effects extended approximately 1,000–2,000 meters to the south, depending on duration of wave actions and the number of the alternative breakwaters. To eliminate these downdrift effects to the south, NASA proposes to construct up to six new breakwaters between the existing breakwater sets.

Construction could occur over the next 7 years, based on need and availability of funding. Phase one of the Proposed Action would construct up to four new breakwaters.

Each breakwater would cover 16,000–18,000 square feet of bottomlands. Construction of each breakwater is estimated to take 2 to 3 months. Breakwater construction could occur using several methods: via barge, temporary bulkheads, or temporary trestle system.

2.3.1 Building Breakwaters by Barge

The rock and other materials for constructing each breakwater would be transported to the breakwater construction area by barge or to the WFF area by truck or rail, offloaded to trucks, transported via existing roads to a nearby harbor, and then barged to the handling or placement site offshore of Wallops Island. Placement would occur in the water using a barge and heavy lifting equipment.

2.3.2 Building Breakwaters Using Temporary Bulkheads

Materials and equipment would be transported to the WFF area by rail and offloaded to trucks, or by truck to and from the island via existing roads. Once on Wallops Island, materials and equipment would be delivered to either an impervious surface or previously disturbed upland staging area. During construction, staging could move to the construction zone on the beach. Temporary bulkhead structures would be constructed using steel sheet piles. Each temporary bulkhead would be roughly 130 feet long by 30 feet wide and use approximately 1,000 cubic yards of temporary sand from either a commercial sand source or part of the dredged beach fill. All equipment and remaining materials after installation would be trucked off-site to the contractor staging area. The process to build each breakwater using temporary bulkheads would include the following steps or similar:

- place equipment (e.g., crawler crane, hydraulic excavator, and vibratory hammer) and material (e.g., steel sheet piles, timber mats, high density polyethylene mats, marine mattresses, armor stone, and core stone) in the staging area;
- fill a sand template;
- install steel pilings using vibratory hammer and crane to create wall (i.e., bulkhead) at each breakwater location;
- place mats and marine mattress;
- transfer armor stone and core stone from staging area to placement site per design plan; and
- extract steel pilings using vibratory hammer and crane, move to the next breakwater location, and repeat the construction process.

2.3.3 Building Breakwaters Using Temporary Trestle System

Materials and equipment would be transported to the WFF area by rail and offloaded to trucks or by truck to and from the island via existing roads. Once on Wallops Island, materials and equipment would be delivered to either an impervious surface or previously disturbed upland staging area. During construction, staging could move to the construction zone on the beach. The process to build each breakwater using a temporary trestle system would include each of the steps listed above, with the exception of creating a bridge (i.e., trestle) at each breakwater location. Instead, a series of steel pilings would be installed via vibratory hammer and beams placed across the top of the piles to form temporary trestles. The system would be 30 to 40 feet wide with crane mats used as decking. Following construction of the last breakwater, the steel

pilings would be removed using vibratory hammer and crane and placed in the staging area prior to transport off-site.

2.4 Seawall Repair and Extension

The existing rock seawall is located along 15,900 feet of the Wallops Island shoreline. Construction of this seawall began in 1992. While the wall has prevented overwash and storm damage, erosion of the shoreline seaward of the wall has continued, resulting in an increased risk of damage to the seawall. The SRIPP analyzed potential effects from repairing and extending the seawall to a maximum length of 4,600 feet south of its southernmost point (NASA 2010a). During the first SRIPP cycle, the seawall was extended approximately 1,430 feet south with the premise that the remaining 3,170-feet extension would be implemented with future funding. The seawall extension would consist of the placement of rocks weighing approximately 5 to 7 tons on a 1 to 1.5 slope. The top of the seawall would be approximately 14 feet above the normal high-tide water level after completion, depending on the extent of existing shoreline retreat at that time. The seawall could require repairs at any location.

2.5 Mitigation

The 2019 PBO requires the following measures to minimize effects to federally listed threatened and endangered species. To minimize these effects, the following mitigations have been incorporated into the Proposed Action:

- Minimization of foot traffic during construction.
- Inspection of all vehicles for leaks immediately prior to work in beach habitat.
- Notification to the USFWS regarding the projected and actual start dates, progress, and completion of the project and confirmation that all conservation measures were followed.
- Submission of an annual report summarizing the survey and monitoring efforts, location and status of all occurrences of listed species recorded, and any additional relevant information to the USFWS by December 31 of each year.
- Should renourishment activities be scheduled between March 15 and August 31, NASA will ensure that a qualified biological monitor conducts daily surveys of the project site and adjacent areas to detect nesting piping plovers and sea turtles, in accordance with established and approved monitoring protocols.
- In accordance with WFF's Protected Species Monitoring Plan, if piping plover or sea turtle nests are identified, the nests will be clearly marked using exclosures or signage and rope barriers encircling each site. A qualified biological monitor would conduct daily nest inspections. All on-site personnel would be informed of the nesting status, and all project activities within 1,000 feet of a nest would be suspended or relocated outside of the 1,000-foot buffer until hatching is complete.
- Preparation and distribution of a fact sheet containing this information to all project personnel.

3.0 Description of the Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 Code of Federal Regulations section 402.02). As with previous shoreline consultations, the action area includes the Wallops Island offshore borrow sites, the waters between and immediately adjacent to these areas where project vessels would travel and dredged material would be transported, the beach and nearshore where sand would be replenished, the offshore area where breakwaters would be constructed,

and the shoreline where seawall repairs and extension could take place. The action area does not include Assawoman Island. The design and placement of project elements were determined through modeling analysis (see **Section 2.3**), which showed no anticipated effects to the island.

4.0 Status of Species within the Action Area

Table 1 provides a review of species that would be potentially affected by the project activities that have been assessed previously in shoreline project consultations. Consistent with previous consultations Green, Kemp's ridley, hawksbill, and leatherback sea turtles within USFWS jurisdiction would not be affected by the Proposed Action and are not carried forward in this discussion. Consultation with the National Oceanographic and Atmospheric Administration (NOAA) Fisheries division on the effects of the Proposed Action on these species in-water is ongoing. **Table 2** is a list of species that have been listed or proposed for listing since the last shoreline consultation as well as their potential to occur in the action area.

Table 1 Previously Evaluated ESA-Listed Species with Potential to Occur in the Action Area

Common Name	ESA Status	Previous Determination	Species/Habitat Presence in Action Area
Northern long- eared bat *(Myotis septentrionalis)*	E	NLAA	Species was not detected (nor was any species of the genus *Myotis*) during 2017–2018 or 2024 bat acoustic and mist netting surveys (Barr 2018; NASA 2024b). While there is suitable habitat present in parts of the island, none is present in the action area.
Piping Plover (*Charadrius melodus*)	T	LAA (Renourishment, Seawall)	Within the action area, plovers use sandy beaches on Metompkin, Assawoman, Wallops, and Assateague Islands for courtship and nesting.
Roseate tern (*Sterna dougalii dougalii*)	E	NLAA	Species has not been identified and is not likely to be present.
Rufa red knot (*Calidris canutus rufa*)	T	LAA (Renourishment, Backpassing)	The majority of knot foraging habitat on Wallops Island occurs on the north end of the island, well north of the action area.
Loggerhead sea turtle (*Caretta caretta*)	T	LAA (Renourishment, Seawall, Breakwaters)	Nests on Wallops Island have been documented on the recreational beach and in front of the rock wall, but are not documented every year. Last recorded nest was 2013.
Seabeach amaranth (*Amaranthus pumilius*)	T	NLAA	Species has not been identified and is not likely to be present.

Key: E = Endangered; ESA = Endangered Species Act; LAA = likely to adversely affect; NLAA = not likely to adversely affect; T= threatened

Table 2 ESA Listed Species not Previously Evaluated with Potential to Occur in the Action Area

Common Name	ESA Status	Species/Habitat Presence in Action Area
Tricolored bat (*Perimyotis subflavus*)	PE	Species was detected during 2017–2018 and was not detected in 2024 bat acoustic and netting surveys (Barr, 2018; NASA, 2024b). While there is suitable habitat present in parts of the island, none is present in the action area.
Eastern black rail (*Laterallus jamaicensis jamaicensis*)	T	NASA completed two sets of surveys during the breeding season: from June 10 to July 13, 2021 (Ritzert, Stein, and Bartok, 2021) and from May 1 to June 6, 2022 (Stein, Bartok, and Ritzert, 2022). No visual or auditory observations of eastern black rails were recorded during surveys. No Eastern black rail habitat (wetlands) exists in the action area.
Bermuda petrel (*Pterodroma cahow*)	E	No Bermuda petrel habitat exists in the action area. The Bermuda petrel is a seabird, primarily nesting on small islands in Bermuda, over 1,000 miles from Wallops Island. It is unlikely that activities would encounter this species foraging offshore as water depths are shallower than those in which the species is usually found.
Monarch butterfly (*Danaus plexippus*)	PT	No suitable habitat exists in the action area.

Key: E = Endangered; ESA = Endangered Species Act; NASA = National Aeronautics and Space Administration; PE = proposed endangered; T= threatened; USFWS = United States Fish and Wildlife Service

4.1 Bats

While habitat does exist on Wallops Island for the endangered northern long-eared bat, none exist in the action area. Northern long-eared bats have not been detected during surveys in 2017, 2018, or 2024. Tricolored bat habitat exists on Wallops Island and were detected in surveys in 2018 (but not in 2024); however, there is no habitat in the action area and the species is not likely to be affected by project activities (NASA 2024a, 2024b).

4.2 Black Rail

NASA completed two sets of visual and auditory surveys to capture peak potential eastern black rail activity during the breeding season. The first set of surveys was conducted from June 10 to July 13, 2021 (Ritzert, Stein, and Bartok 2021) and the second set was conducted from May 1 to June 6, 2022 (Stein, Bartok, and Ritzert 2022). No visual or auditory observations of eastern black rails were recorded during surveys. No eastern black rail habitat (wetlands) exists in the action area, and no wetlands would be affected by the Proposed Action.

4.3 Bermuda Petrel

Bermuda petrels are unlikely to encounter dredging activities as water depths are shallower than where the species is usually found. Based on this, along with the small size of the area offshore that would be affected by dredging, the duration of activities, the patchy and seasonal distribution of the species over a large area, we conclude that dredging has a discountable probability of affecting Bermuda petrels.

4.4 Monarch Butterfly

The monarch butterfly, proposed for federal listing as threatened, also has no suitable habitat within the project area.

4.5 Piping Plover

Since 2010, NASA has conducted annual piping plover surveys three to four times weekly between March 15 and August 31, or until the last chick fledges. Additionally, when renourishment occurs during the nesting season, NASA increases monitoring to 7 days a week. **Table 3** illustrates historic nest data.

Table 3 Historic Piping Plover Nesting on Wallops Island

Year	Nests	Chicks Fledged
2017	6	4
2018	3	3
2019	7	5
2020	7	0
2021	3	0
2022	4	0
2023	3	3
2024	7	1
2025	3	8

Sources: NASA 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024c, 2025

4.6 Rufa Red Knot

Since 2010, NASA has observed and recorded the presence of red knots on the north end of Wallops Island during their May spring migrations. **Table 4** illustrates historic rufa red knot counts at Wallops Island. In 2021 and 2023, the USFWS proposed critical habitat for the rufa red knot, including two areas on Wallops Island: one 540-acre area on northern Wallops Island and a 31-acre area on southern Wallops Island. Although the project area overlaps the proposed critical habitat, the designation has not been finalized.

Table 4 Historic Rufa Red Knot Counts on Wallops Island

Year	Count
2017	415
2018	393
2019	2,020
2020	117
2021	0
2022	622
2023	186
2024	53
2025	1,744

Sources: NASA 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024c, 2025

4.7 Loggerhead Sea Turtle

In accordance with the Protected Species Monitoring Plan, NASA monitors for loggerhead sea turtle nesting in conjunction with piping plover monitoring. If a nest is discovered, monitoring continues through November 30, or until the last hatchling leaves the nest. While NASA has observed loggerhead sea turtles and sea turtle nesting activity in the past, numbers are low, and some years have no observations of sea turtle nesting. Between 2010 and 2013, NASA observed a total of eight nests and five false crawls on Wallops Island beach. DNA analysis determined that all four nests in 2010 were dug by a single female loggerhead sea turtle (NASA 2010b; USFWS 2016). No sea turtle nesting activity has been observed on Wallops Island since 2013. Historically, only loggerhead sea turtles have been found on Wallops (NASA 2023).

5.0 Effects of the Action on Listed Species

The following sections provide a summary of potential effects. Project elements are substantially similar to those assessed previously in the SRIPP BA, 2010 Programmatic BO, 2016 BO, 2019 Programmatic BO, and 2021 Project Modification; therefore, there would be no change to species effects determinations from those consultations. None of the species listed since 2019 have the potential to occur in the action area.

5.1 Dredging

The effects of dredging on sea turtles offshore is being evaluated in consultation with NOAA Fisheries. Bermuda petrels are unlikely to encounter dredging activities as water depths are shallower than where the species is usually found. This, along with the small size of the area offshore that would be affected by dredging, the duration of activities, the patchy and seasonal distribution of the species over a large area, suggest that dredging has a discountable probability of affecting Bermuda petrels. Dredging is not expected to affect any other ESA-listed species managed by USFWS.

5.2 Beach Renourishment

Beach renourishment activities proposed here are entirely within levels consulted on previously. There would be no additional effects or take of piping plover, red knot, or loggerhead sea turtles from beach renourishment activities.

Beach renourishment would temporarily disturb piping plover and loggerhead sea turtle nesting habitat and red knot migratory habitat, though currently the quality of existing habitat has been diminished by erosion and use and productivity are historically low. In the long term, the beach nesting habitat would be stabilized by beach renourishment and other stabilization efforts. Benthic prey items in the sand template would be buried during renourishment, resulting in the temporary loss of foraging habitat for piping plovers and rufa red knots. Given the small area affected by the proposed activities relative to abundant adjacent habitats and the ability of these species to exploit food sources over a large area, these effects would be minor. In the long term, a wider stable beach would be recolonized by benthos from adjacent areas and would provide foraging habitat for these species. Effects would not appreciably diminish the value of the proposed rufa red knot critical habitat over the long term because beach foraging habitat would be stabilized; therefore, the proposed action is not likely to adversely modify proposed critical habitat.

Noise and human presence in the renourishment area could disturb piping plovers, red knots, and loggerhead sea turtles for the duration of activities. Nesting sea turtles could be impacted by nighttime construction activity (particularly artificial lighting) on the beach, unintentional burial of a newly dug nest (if it were undetected), disorientation of hatchlings (due to project-related light sources), or obstruction to hatchlings during their emergence and subsequent trip to the ocean. The replenished beach would prove suitable to nesting turtles because the beach fill material is not substantially different from nearby native beaches. Moreover, as evidenced by the sea turtle nesting that occurred on the Wallops Island beach during the initial beach fill cycle, and continued piping plover nesting, it is possible that the additional elevated beach would provide suitable nesting habitat.

5.3 Breakwater Construction

Breakwater construction activities proposed here are substantially the same as those consulted on in 2019. The 2019 BO and 2021 amendment (USFWS 2019, 2021) did not include incidental

take associated with breakwater construction, including building breakwaters from the Wallops Island beach.

Noise and human presence during breakwater construction could disturb piping plovers, red knots, and loggerhead sea turtles for the duration of activities. Nesting piping plovers and foraging red knots have not been documented in the breakwater construction area. However, sea turtle nesting occurred on the new Wallops Island dune between the existing sets of breakwaters, after the initial beach fill, indicating that it is very possible that the renourished elevated beach would provide additional sea turtle nesting habitat, a net benefit to the species. The construction of breakwaters could potentially cause disturbance and area avoidance by sea turtles, depending on the time of year construction was initiated. Impacts to nesting sea turtles could include avoided nesting attempts due to construction activity (noise, artificial lighting) on the beach, disorientation of hatchlings (due to project-related light sources), obstruction to hatchlings during their emergence and subsequent trip to the ocean, or loss of beach habitat during construction. Post-construction, a wider, stable beach would be colonized by benthos from adjacent areas and would provide foraging habitat for piping plover and rufa red knot in 3 to 6 months (Hill-Spanick et al. 2018; Tauran et al. 2025). In addition, the above-water portion of the breakwaters would provide potential roosting and resting area for birds.

5.4 Seawall Repair and Extension

Seawall repair and extension has been included in consultations since 2010. No change to previously evaluated methodology, location, or size is proposed. The 2019 BO and 2021 amendment (USFWS 2019, 2021) and subsequent communications did not include incidental take associated with seawall repair and extension.

Noise and human presence associated with seawall work could disturb piping plovers, red knots, and loggerhead sea turtles for the duration of activities, though the quality of habitat in the areas where these activities could occur is low. Extension of the seawall could cover existing foraging habitat. Possible effects on nesting turtles would be generally the same as those discussed for beach renourishment and breakwater construction.

6.0 Effects Determination

Based on the discussion above and consistent with previous consultations, NASA has made determinations of effects resulting from components of the proposed action on ESA-listed species (**Table 5**).

Table 5 Effects Determinations

Species	Dredging	Beach Renourishment	Breakwater Construction	Seawall Repair and Extension
Evaluated in Previous Consultations				
Northern long-eared bat	NE	NLAA	NLAA	NLAA
Piping plover	NE	LAA	NLAA	NLAA
Roseate tern	NE	NLAA	NLAA	NLAA
Rufa red knot	NE	LAA	NLAA	NLAA
Loggerhead sea turtle	*	LAA	LAA	LAA
Seabeach amaranth	NE	NLAA	NLAA	NLAA
Listed Since Previous Consultation				
Eastern black rail	NE	NE	NE	NE
Bermuda petrel	NE	NE	NE	NE
Proposed for ESA Listing				
Tricolored bat (PE)	NE	NE	NE	NE
Monarch butterfly (PT)	NE	NE	NE	NE

Key: * = jurisdiction of NOAA Fisheries; LAA = likely to adversely affect; NE = no effect;; NLAA = not likely to adversely affect

7.0 Conclusion

In consideration of the scope of the proposed project, listed species known to inhabit the project area, and the potential effects on those species, NASA concludes that the proposed action is substantially similar in scope, geography and timing to that covered in the SRIPP BA, 2010 Programmatic BO, 2016 BO, 2019 Programmatic BO and 2021 Project Modification. Species listed or proposed for listing since the 2019 Programmatic BO would not be affected or are not likely to be affected by the proposed action. Further, NASA concludes that impacts associated with the proposed action are substantially similar as those previously consulted, as summarized in **Table 5**. NASA is seeking the Service's concurrence on these determinations.

If you have any questions or require additional information, please contact Ms. Lori Levine at (301) 286-6741 or lori.m.levine@nasa.gov.

Sincerely,

SHARI MILLER

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Shari Miller
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United States Department of the Interior

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Project Code: 2026-0063223
Project Name: NASA Shoreline Renourishment

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Coastal Barriers

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

PROJECT SUMMARY

Project Code: 2026-0063223
Project Name: NASA Shoreline Renourishment
Project Type: Beach nourishment
Project Description: The Proposed Action could involve a combination of the following, implemented in phases over the next 7 years.
• Dredging up to 4.5 million cubic yards of sand from Offshore Unnamed Shoal A;
• Sand renourishment within an approximately 15,000-foot section of shoreline;
• Construction of up to six breakwaters in the nearshore area between the existing breakwaters; and
• Repairs and extension (remaining 3,170 feet of the original 4,600 feet) of the existing seawall.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.84281385,-75.47564223986035,14z

Counties: Accomack County, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

REPTILES

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Hawksbill Sea Turtle *Eretmochelys imbricata* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle *Dermochelys coriacea*	Endangered

NAME	STATUS
There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1493	
Loggerhead Sea Turtle *Caretta caretta* Population: Northwest Atlantic Ocean DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1110	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Seabeach Amaranth *Amaranthus pumilus* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Rufa Red Knot *Calidris canutus rufa* https://ecos.fws.gov/ecp/species/1864#crithab	Proposed

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

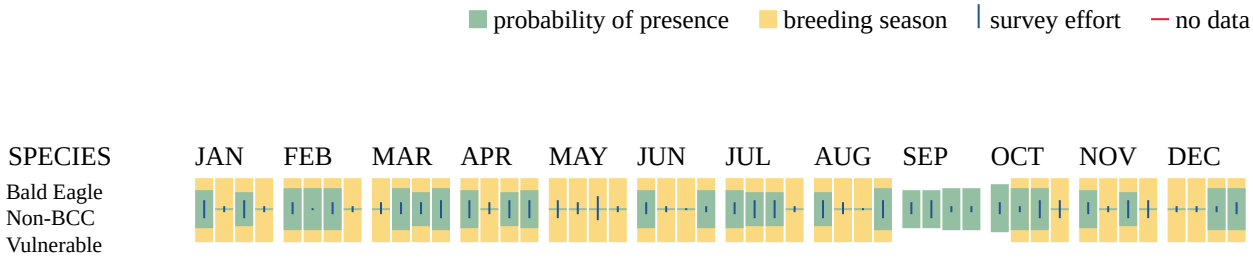
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher *Haematopus palliatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black Scoter *Melanitta nigra* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10413	Breeds elsewhere
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15

NAME	BREEDING SEASON
Brown Pelican *Pelecanus occidentalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/6034	Breeds Jan 15 to Sep 30
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Common Eider *Somateria mollissima* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10457	Breeds Jun 1 to Sep 30
Common Loon *gavia immer* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/4464	Breeds Apr 15 to Oct 31
Double-crested Cormorant *phalacrocorax auritus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/3478	Breeds Apr 20 to Aug 31
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Gull-billed Tern *Gelochelidon nilotica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
King Rail *Rallus elegans* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Least Tern *Sternula antillarum antillarum* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11919	Breeds Apr 25 to Sep 5

NAME	BREEDING SEASON
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-tailed Duck *Clangula hyemalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/7238	Breeds elsewhere
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-breasted Merganser *Mergus serrator* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10693	Breeds elsewhere
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Red-throated Loon *Gavia stellata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/9589	Breeds elsewhere
Ring-billed Gull *Larus delawarensis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10468	Breeds elsewhere

NAME	BREEDING SEASON
Royal Tern *Thalasseus maximus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10471	Breeds Apr 15 to Aug 31
Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633	Breeds elsewhere
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Saltmarsh Sparrow *Ammospiza caudacuta* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9719	Breeds May 15 to Sep 5
Scarlet Tanager *Piranga olivacea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11967	Breeds May 10 to Aug 10
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Sooty Shearwater *Ardenna grisea* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10417	Breeds elsewhere
Surf Scoter *Melanitta perspicillata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10463	Breeds elsewhere

NAME	BREEDING SEASON
Whimbrel *Numenius phaeopus hudsonicus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11991	Breeds elsewhere
White-winged Scoter *Melanitta fusca* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10462	Breeds elsewhere
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds Apr 20 to Aug 5
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

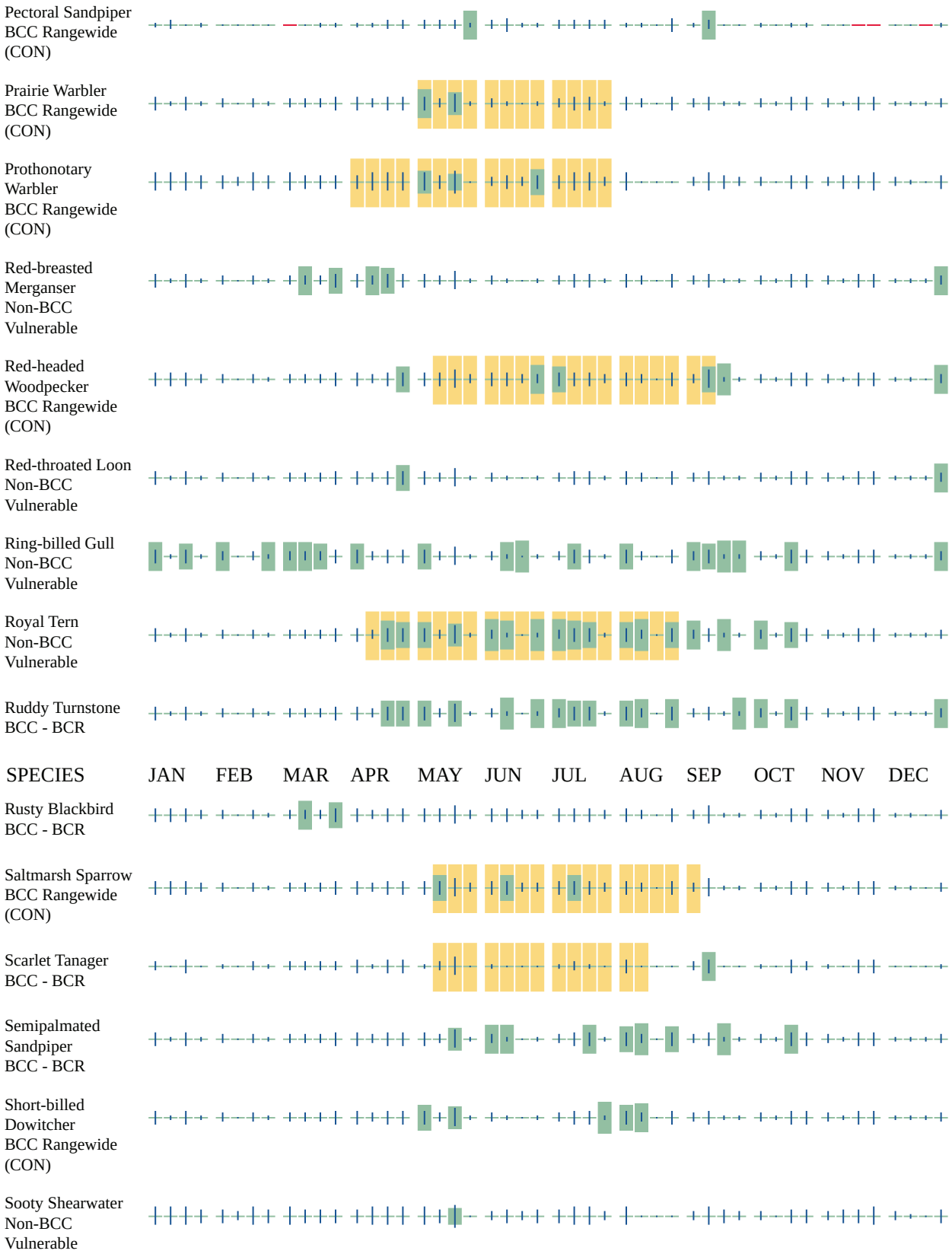
Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

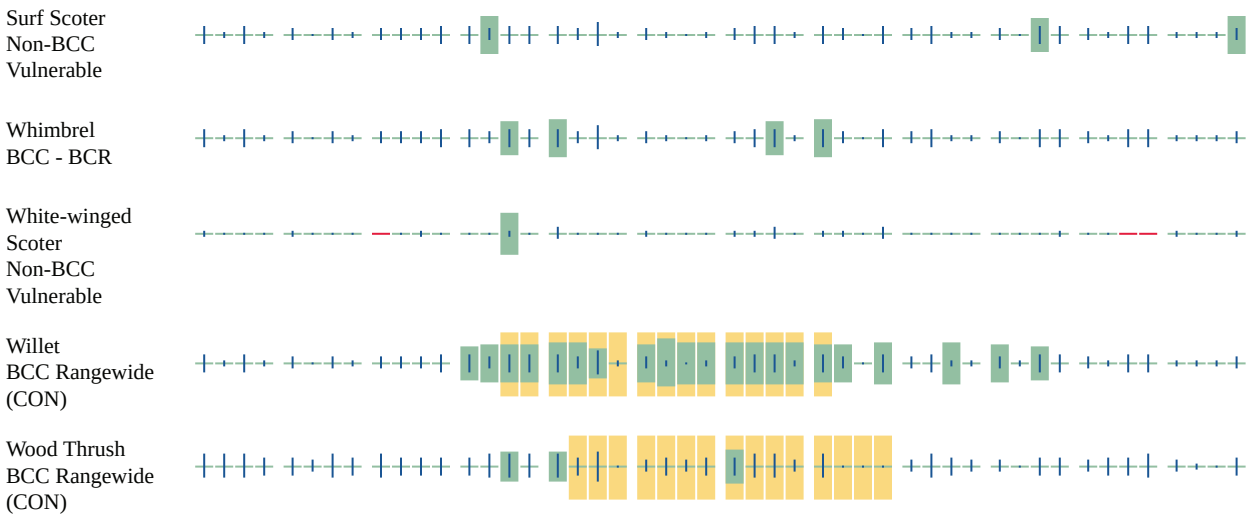
Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

▪ probability of presence ▪ breeding season | survey effort – no data


SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
American Oystercatcher BCC Rangewide (CON)
Bald Eagle Non-BCC Vulnerable
Black Scoter Non-BCC Vulnerable
Black Skimmer BCC Rangewide (CON)
Brown Pelican Non-BCC Vulnerable
Chimney Swift BCC Rangewide (CON)
Common Eider Non-BCC Vulnerable
Common Loon Non-BCC Vulnerable
Double-crested Cormorant Non-BCC Vulnerable
Grasshopper Sparrow BCC - BCR
Gull-billed Tern BCC Rangewide (CON)
King Rail BCC Rangewide (CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Least Tern BCC Rangewide (CON)
Lesser Yellowlegs BCC Rangewide (CON)
Long-tailed Duck Non-BCC Vulnerable


Pectoral Sandpiper
BCC Rangewide
(CON)
Prairie Warbler
BCC Rangewide
(CON)
Prothonotary
Warbler
BCC Rangewide
(CON)
Red-breasted
Merganser
Non-BCC
Vulnerable
Red-headed
Woodpecker
BCC Rangewide
(CON)
Red-throated Loon
Non-BCC
Vulnerable
Ring-billed Gull
Non-BCC
Vulnerable
Royal Tern
Non-BCC
Vulnerable
Ruddy Turnstone
BCC - BCR
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Rusty Blackbird
BCC - BCR
Saltmarsh Sparrow
BCC Rangewide
(CON)
Scarlet Tanager
BCC - BCR
Semipalmated
Sandpiper
BCC - BCR
Short-billed
Dowitcher
BCC Rangewide
(CON)
Sooty Shearwater
Non-BCC
Vulnerable



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

COASTAL BARRIERS

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

OTHERWISE PROTECTED AREA (OPA)

OPAs are denoted with a "P" at the end of the unit number. The only prohibition within OPAs is on Federal flood insurance. ***CBRA consultation is not required for projects within OPAs.*** *However, agencies providing disaster assistance that is contingent upon a requirement to purchase flood insurance after the fact are advised to disclose the OPA designation and information on the restrictions on Federal flood insurance to the recipient prior to the commitments of funds.*

UNIT	NAME	TYPE	SYSTEM UNIT ESTABLISHMENT DATE	FLOOD INSURANCE PROHIBITION DATE
VA-02P	Assawoman Island	OPA	N/A	11/25/2025

IPAC USER CONTACT INFORMATION

Agency: National Aeronautics and Space Administration
Name: Elizabeth Pruitt
Address: 501 Butler Farm Road, Suite H
City: Hampton
State: VA
Zip: 23666
Email elizabeth.pruitt@cardno-gs.com
Phone: 4349444847

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

March 26, 2026

Shari Miller
National Aeronautics and Space Administration (NASA)
Lead, Environmental Planning
Code 250.W
Wallops Flight Facility
Wallops Island, VA 23337

Re: NASA Shoreline Renourishment, Accomack County, VA, Project # 2026-0063223

Shari Miller:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) March 3, 2026 receipt of your email requesting initiation of formal Section 7 consultation under the Endangered Species Act (16 USC 1536), as amended (ESA). The referenced action involves beach nourishment activities, breakwater construction, and the repair and extension of the seawall along Wallops Island in Accomack County, VA. A subsequent modification letter will be issued removing these activities from the 2019 Biological Opinion.

The federally listed threatened piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), loggerhead sea turtle (*Caretta caretta*) Northwest Atlantic Ocean distinct population segment, and proposed critical habitat for the red knot (*Calidris canutus rufa*) are likely to be adversely affected by the proposed action. All information required to initiate consultation was either included with your letter or is otherwise accessible for our consideration and reference.

We concur with your determination that the federally listed endangered roseate tern (*Sterna dougalii dougalii*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), and Kemp's ridley sea turtle (*Lepidechelys kempii*), and federally listed threatened green sea turtle (*Chelonia mydas*) North Atlantic distinct population segment and seabeach amaranth (*Amaranthus pumilius*) are not likely to be adversely affected by the proposed action.

NASA made a no effect determination for the federally listed threatened Eastern black rail (*Laterallus jamaicensis jamaicensis).*

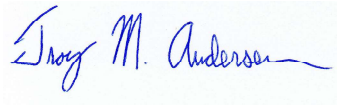
Section 7 implementing regulations (50 CFR 402.14) provide the Service up to 90 days to conclude formal consultation and an additional 45 days to prepare our biological opinion, unless we mutually agree to an extension. Therefore, we expect to provide the biological opinion on or before July 16, 2026.

As a reminder, the ESA requires that after initiation of formal consultation, the Federal action agency shall make no irreversible or irretrievable commitment of resources that limits future options. This practice ensures agency actions do not preclude the formulation or implementation of avoidance and minimization measures or development of reasonable and prudent alternatives that avoid jeopardizing

the continued existence of endangered or threatened species or destroying or modifying their critical habitat.

If you have any questions, please contact Emily Argo of this office at (804) 404-8184 or emily_argo@fws.gov.

Sincerely,



Troy Andersen
Field Supervisor
Virginia Ecological Services

cc: BOEM, Washington, DC (Attn: Leighann Brandt, Jennifer Bucatari)
Corps, Norfolk, VA (Attn: Shannon Reinheimer, Shadera Williams)
NASA, Wallops Island, VA (Attn: William Harris, Brendan Deyo, John Saeker, Lori Levine, Irene Romero)
Service, Chincoteague, VA (Attn: Kevin Holcomb)
VDWR, Machipongo, VA (Attn: Ruth Boettcher)

From: Miller, Shari (LARC-2500)
To: Argo, Emily E
Cc: irene.j.romero; Levine, Lori (GSFC-2500); Elizabeth Pruitt
Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE
Date: Monday, March 30, 2026 9:25:46 AM
Attachments: image003.png
image004.png
image005.png
image001.png

Good morning, Emily,

I'm hoping the attached will help with your analysis of impacts to the proposed red know Critical Habitat. NASA is consulting on the entire beach fill (base bid plus 2 options) and we've calculated a 0.49-acre overlap of the South Beach Option for sand fill onto the proposed critical habitat from ECOS. There would be no overlap from the North Beach Option.

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center
o: 757.864.5662
shari.a.miller@nasa.gov

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Monday, March 23, 2026 2:47 PM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Hi Shari,

A determination of likely to adversely affect critical habitat is different than adverse modification, so an adverse effect to critical habitat does not mean the result would be adverse modification. A similar way to think about this is that a likely to adversely affect determination for the species does not automatically mean a jeopardy determination in a biological opinion.

Hopefully, this helps to clarify, but let me know if you have further questions.

Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Sent: Monday, March 23, 2026 1:24 PM
To: Argo, Emily E <emily_argo@fws.gov>
Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com <Elizabeth.Pruitt@cardno-gs.com>
Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Good afternoon, Emily.

Yes, NASA is making a no effect determination for eastern black rail.

Regarding the adverse modification LAA determination for proposed critical habitat, the Corps of Engineers (USACE) Engineering and Research Center (ERDC) conducted modelling in accordance with USACE Coastal Groins and Nearshore Breakwaters Engineering and Design Manual. The modelling indicated that habitat would not be lost south of the breakwaters, including habitat in the proposed red knot critical habitat area, VA-2B (the proposed renourishment does not extend to VA-2A as that area is accreting sand). Since the project would potentially increase the habitat in VA-2B through shoreline augmentation (as discussed in our 2014 Conference), NASA determined this action would not likely adversely modify proposed critical habitat. Could you tell us what terms and conditions may be imposed if the Service determines the actions are likely to adversely modify the proposed critical habitat?

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center

o: 757.864.5662
shari.a.miller@nasa.gov

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Monday, March 23, 2026 8:26 AM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Hi Shari,

Am I correct to assume you are making a no effect determination for the black rail? That is my assumption based on the information in the table, but I am looking for confirmation.

For the rufa red knot proposed critical habitat, the adverse modification determination is made in the biological opinion and a determination of NLAA, LAA, or no effect would still be made at this stage. Given the activities and the location of the units on Wallops Island, I will be indicating the LAA determination in the letter and proceed with the adverse modification analysis in the biological opinion.

Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Sent: Tuesday, March 17, 2026 10:23 AM
To: Argo, Emily E <emily_argo@fws.gov>
Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com <Elizabeth.Pruitt@cardno-gs.com>

Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Good morning, Emily,

Attached is a new official species list from IPAC. All species and proposed critical habitat on the attached are evaluated in NASA's consultation package submitted February 26, 2026.

Bethany beach firefly doesn't appear on this list.

Eastern black rails are discussed in Table 2 "ESA Listed Species not Previously Evaluated with Potential to Occur in the Action Area" and Table 5 "Effects Determination" as well as in Section 4.2 with the determination of "No effect" (Table 5) since "No eastern black rail habitat (wetlands) exists in the action area, and no wetlands would be affected by the Proposed Action" (Table 2, Section 4.2).

Proposed rufa red knot critical habitat is discussed in Section 4.6 and Section 5.2. In Section 5.2, NASA determined that "Effects would not appreciably diminish the value of the proposed rufa red knot critical habitat over the long term because beach foraging habitat would be stabilized; therefore, the proposed action is not likely to adversely modify proposed critical habitat."

NASA is not proposing to change any effects determinations for these species or proposed critical habitat and wishes to proceed with the submitted evaluation. Therefore, we'd like to confirm that we are still anticipating completion of consultation before July 13, 2026.

Please let me know if you have any additional questions.

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center
o: 757.864.5662
shari.a.miller@nasa.gov

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Tuesday, March 17, 2026 9:43 AM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>

Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Hi All,

I am checking in on my email below, I need this information to complete our official response letter.

Thanks,
Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Thursday, March 12, 2026 5:40 PM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com <Elizabeth.Pruitt@cardno-gs.com>
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Hi Shari,

Can you generate an updated Official Species List and provide determinations for all species/critical habitat listed? Since the last Opinion the Eastern black rail has been listed. And we also have proposed critical habitat for red knot and the proposed listed of the Bethany Beach firefly, so I need to know how you wish to proceed with those species.

Thanks,
Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service

6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Sent: Tuesday, March 3, 2026 9:00 AM
To: Argo, Emily E <emily_argo@fws.gov>; Andersen, Troy M <troy_andersen@fws.gov>
Cc: Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Elizabeth.Pruitt@cardno-gs.com <Elizabeth.Pruitt@cardno-gs.com>
Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Emily,

I apologize for any confusion in the cover letter. Please accept this email as NASA's request to reinitiate consultation for Project # 2015-F-3317.

Let us know if you have any additional questions.

Thanks so much.

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
Goddard Space Flight Center
o: 757.864.5662
shari.a.miller@nasa.gov

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Monday, March 2, 2026 1:32 PM
To: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Lori,

This is not clear from your letter, which includes the following statements:

"NASA requests USFWS concurrence that the action currently proposed is substantially similar to

those considered previously (in the SRIPP Biological Assessment [BA], 2010 Programmatic Biological Opinion [BO], 2016 BO, and 2019 Programmatic BO, 2021 Project Modification, and 2024 Letter of Concurrence [LoC]) and that these actions may affect and are likely to adversely affect piping plovers, red knots, and loggerhead sea turtles. Further, because the actions are substantially similar in scope and geography, and have similar effects to the same listed species, NASA requests to update its incidental take statement to reflect this Proposed Action, which would be implemented in phases over the next approximately 7 years."

"In consideration of the scope of the proposed project, listed species known to inhabit the project area, and the potential effects on those species, NASA concludes that the proposed action is substantially similar in scope, geography and timing to that covered in the SRIPP BA, 2010 Programmatic BO, 2016 BO, 2019 Programmatic BO and 2021 Project Modification. Species listed or proposed for listing since the 2019 Programmatic BO would not be affected or are not likely to be affected by the proposed action. Further, NASA concludes that impacts associated with the proposed action are substantially similar as those previously consulted, as summarized in Table 5. NASA is seeking the Service's concurrence on these determinations."

One statement requests that an updated incidental take statement be provided, while the other states that you are seeking Service concurrence with a not likely determination. The letter does not state you are reinitiating consultation. Please provide an email or a revised letter requesting to reinitiate consultation if that is what you are intending.

Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>
Sent: Monday, March 2, 2026 1:21 PM
To: Argo, Emily E <emily_argo@fws.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Emily,
We are reinitiating consultation with our revised letter.

Lori Levine
Water Quality, Oil Operations, and Natural Resources Programs
NASA's Goddard Space Flight Center
Medical & Environmental Management Division, Code 250
o: (301) 286-6741
Chat with me on Teams

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Monday, March 2, 2026 11:19 AM
To: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Good morning Lori and Shari,

I wanted to clarify that, based on the revised letter provided, you are not intending to modify the project to be within the scope of the 2019 BO or reinitiate consultation as discussed during our February call?

Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>
Sent: Tuesday, February 24, 2026 11:48 AM
To: Argo, Emily E <emily_argo@fws.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Emily,
We are revising our letter for formal consultation and should have it to you soon.

Best,

Lori Levine
Water Quality, Oil Operations, and Natural Resources Programs
NASA's Goddard Space Flight Center
Medical & Environmental Management Division, Code 250
o: (301) 286-6741
Chat with me on Teams

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Tuesday, February 24, 2026 11:43 AM
To: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: Re: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Hi Lori and Shari,

Do you have any updates on how NASA wants to proceed with the consultation following our conversation on February 3, 2026?

Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184

From: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>
Sent: Thursday, January 29, 2026 2:45 PM
To: Argo, Emily E <emily_argo@fws.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: RE: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Emily,
Shari and I are available on Tuesday at 11:30-12:00 or from 1:00-2:00.

Best,
Lori Levine

Water Quality, Oil Operations, and Natural Resources Programs
NASA's Goddard Space Flight Center
Medical & Environmental Management Division, Code 250
o: (301) 286-6741
Chat with me on Teams

From: Argo, Emily E <emily_argo@fws.gov>
Sent: Thursday, January 29, 2026 2:39 PM
To: Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>; Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>
Cc: Andersen, Troy M <troy_andersen@fws.gov>
Subject: [EXTERNAL] Follow-up call re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE

Good afternoon Shari and Lori,

Troy and I have had some internal discussions and wanted to follow-up with you on consultation options. This would be a discussion between NASA, as the lead federal agency, and the Service.

Here are some available times next week, let us know what would work best for you both.

Tuesday 2/3: 11-12pm; 1-2:30pm
Friday 2/6: 9:30am-1pm

Emily

Emily E. Argo
Fish and Wildlife Biologist
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
(804) 404-8184


Causeway Rd
Bypass Rd
Seawall Rd
Atlantic Ocean
Rufa Red Knot Proposed Critical Habitat
Beach (Base)
Beach (North Option)
Beach (South Option)
Road
0
0.25
0.5
Miles
0
0.5
1
Kilometers
Chesapeake Bay
Norfolk

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Appendix F
Endangered Species Act Consultation with NOAA Fisheries

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National Aeronautics and Space Administration

Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

Reply to Attn of: 250.W

January 20, 2026

Julie Crocker
Acting Assistant Regional Administrator
Protected Resources Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Ms. Crocker:

This correspondence serves as the National Aeronautics and Space Administration's (NASA's) notification to the National Oceanographic and Atmospheric Administration (NOAA) Fisheries of its proposed Shoreline Protection Program at Wallops Flight Facility (WFF), Wallops Island, Virginia. This project tiers to the 50-year Shoreline Restoration and Infrastructure Protection Program (SRIPP). The goal of the SRIPP is to reduce direct damage to Wallops Island's infrastructure, allowing WFF to continue its mission of supporting aerospace programs.

To date, there have been three renourishments and shoreline protection projects. The initial cycle of renourishment was completed in August 2012. The second cycle, which repaired the effects of Hurricane Sandy, was completed in September 2014. The third, which incorporated breakwater construction, was completed in 2021. The current Proposed Action is to perform additional beach renourishment, breakwater construction, and to repair and extend the existing sea wall. These activities are needed to maintain the beach berm and dune system, which is vital to protecting critical NASA, United States (U.S.) Navy, Department of Air Force, and Virginia Space Authority assets. The purpose of this correspondence is to request NOAA Fisheries concurrence that consultation does not need to be reinitiated based on the similarity of potential effects to those previously assessed in the SRIPP (as amended).

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) Regulatory Program has jurisdiction over the disposal of dredged and fill material in Waters of the U.S. Similarly, under Section 10 of the Rivers and Harbors Act of 1899, the USACE has jurisdiction over the placement of structures and work conducted in navigable waters of the U.S. and would issue a permit to enable the proposed project. Additionally, the USACE Norfolk District is overseeing project design, construction, and monitoring on NASA's behalf. The U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) has jurisdiction over mineral resources on the Federal Outer Continental Shelf and would enter into a negotiated agreement with NASA and USACE pursuant to section 8(k)(2)(d) of the Outer Continental Shelf Lands Act. Therefore, both BOEM and USACE are serving as cooperating agencies on this project.

To this end, NASA has assumed the role of Lead Federal Agency for Endangered Species Act (ESA) Section 7 compliance and both BOEM and USACE are participating in NASA's ESA

consultation. The effects of their actions are considered in all project documents, including this correspondence.

1.0 Background

1.1 Shoreline Restoration and Infrastructure Protection Program

On December 13, 2010, NASA issued a Record of Decision (ROD) for the WFF SRIPP Programmatic Environmental Impact Statement (2010 Final SRIPP PEIS [NASA, 2010a]), which analyzed structural and non-structural options, varying beach berm widths, and multiple sources of fill material that could be used to restore and protect the Wallops Island shoreline over 50 years. During this time, an estimated nine beach renourishment cycles at approximately 5-year intervals were anticipated. In its ROD, NASA selected beach fill (from Unnamed Shoal A, Unnamed Shoal B, or north Wallops Island beach) and seawall extension and adopted a suite of mitigation and monitoring protocols to reduce potential environmental impacts and track project performance.

The initial phase entailed placement of approximately 3.2 million cubic yards of sand dredged from Unnamed Shoal A along the Wallops Island shoreline and a 1,430-foot southerly extension of the rock seawall with future extensions to a maximum length of 4,600 feet.

NASA consulted with NOAA Fisheries, which issued a Biological Opinion (BO) (July 22, 2010) that concluded the proposed action:

- *Would have no effect to hawksbill sea turtles based on the very low probability of presence within the Action Area*;
- *May affect, but is not likely to adversely affect humpback whale, fin whale, North Atlantic right whale, leatherback sea turtle, and Atlantic green sea turtle; and*
- *May affect but would not jeopardize the continued existence of loggerhead sea turtle (Northwest Atlantic Ocean Distinct Population Segment) and Kemp's ridley sea turtle*.

The SRIPP BO included an Incidental Take Statement (ITS), exempting the take of nine sea turtles (eight loggerhead sea turtles and one Kemp's ridley sea turtle) over the 50-year life of the project (based on one turtle injury or mortality for every 1.6 million cubic yards of material removed from offshore borrow areas). While no takes were documented in the daily biological observer dredge reports during the initial dredging operations, NASA assumes 2 loggerhead sea turtles may have been taken based on a total 3.2 million cubic yards dredged.

1.2 Post-Hurricane Sandy Shoreline Repair

A second renourishment and repair to a section of the seawall were required after Hurricane Sandy made landfall in October 2012. NASA prepared the Post-Hurricane Sandy Shoreline Repair Final Environmental Assessment (EA), signed a Finding of No Significant Impact (FONSI) on June 6, 2013 (NASA, 2013), and consulted with NOAA Fisheries which issued a BO (August 3, 2012). In addition to the previous determinations, it added that the proposed action:

- *May adversely affect but is not likely to jeopardize the continued existence of the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, or South Atlantic DPSs of Atlantic sturgeon.*

In addition to the ITS for sea turtles issued in the 2010 BO, it provided for the exempted incidental take of no more than one Atlantic sturgeon for approximately every 9.4 million cubic yards of material removed from the borrow areas, or a total of two Atlantic sturgeon.

Repairs to the seawall and second beach renourishment of 650,000 cubic yards of sand were completed in September 2014. During this renourishment, unexploded ordnance was discovered in a hopper intake basket. Subsequently, munitions and explosives of concern (MEC) screening was added to the dredge to protect personnel and equipment. Since MEC screening was not included in the earlier consultations and would preclude the identification of remains by on-board observers, NASA requested the SRIPP BO be amended to account for this addition. On September 26, 2014, NOAA Fisheries issued an amendment to the SRIPP BO which added the requirement for an on-vessel lookout bridge watch when MEC screening is used, provided an ITS for Atlantic sturgeon, and concluded that incidental take of sea turtles would be unchanged by the addition of MEC screening. While no takes were documented in the daily biological observer dredge reports during the Post-Hurricane Sandy dredging operations, based on a total of 650,000 cubic yards dredged, NASA would assume a fractional take of 0.4 loggerhead sea turtles and 0.07 Atlantic sturgeon. Therefore, between the combined SRIPP and Post-Hurricane Sandy dredging events of 3,850,000 cubic yards, NASA assumes a total take of 2.4 sea turtles (2.165 loggerheads and 0.24 kemps ridley) and 0.4 Atlantic sturgeon.

1.3 Shoreline Enhancement and Restoration Project

Subsequent storms in 2015, 2016, and 2018 resulted in a reduction of over a million cubic yards of sand in the southern portion of the island as compared to volumes present after the 2014 shoreline repair (USACE, 2018a). In 2018, NASA requested the USACE Norfolk District Hydraulics and Hydrology Section evaluate the effectiveness of constructing breakwater(s) along the shoreline to reduce the intensity of wave action and the rate of sediment transport, since previous renourishments provided only temporary protection. The USACE modeled how alternative placement, size, and number of breakwaters affected shoreline stabilization and sediment transport. Results indicated the placement of detached parallel breakwaters approximately 200 feet offshore would be most effective (USACE, 2018b).

NASA proposed to continue the SRIPP by implementing the Shoreline Enhancement and Restoration Project (SERP). It prepared the SERP EA and signed a FONSI on July 16, 2019 (NASA, 2019). Repairs included beach renourishment using approximately 1.1 million cubic yards of sand sourced from the north Wallops Island beach and construction of five breakwaters using barges. These were constructed in two sets—two breakwaters constructed in front of the Horizontal Integration Facility and three breakwaters constructed south of these, in front of Launch Pad 0-B.

NASA provided the SERP Biological Evaluation (BE), which included the recently-listed giant manta ray. In a letter dated November 20, 2018, NOAA Fisheries determined that it was not necessary to reinitiate the consultation on the SRIPP BO (as amended).

In October 2020, NASA proposed modifications to the breakwater construction methods. Three tropical storms/hurricanes had caused construction delays and posed hazards to personnel and equipment. Because of this, NASA proposed to build the three southern breakwaters via temporary bulkheads constructed perpendicular to the shoreline. NASA requested concurrence that the change to construction methodology would result in no additional effects to protected species. On October 2, 2020, NOAA Fisheries provided its concurrence via email and stated that reinitiation of consultation was not required.

2.0 Proposed Action

The beach and dune system established to protect NASA's Wallops Island launch range infrastructure has continued to erode through storm wind and wave damage. The effects of storms are most apparent in the southern half of the Wallops Island beach, where the majority of the critical launch assets are located.

The current Proposed Action is to perform additional beach renourishment, breakwater construction, and/or seawall repair and extension taking into consideration new information. NASA's proposed action would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The Proposed Action could involve a combination of the following, implemented in phases over the next 7 years (**Figure 1**):

- sand renourishment within an approximately 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station;
- construction of up to 12 breakwaters in the nearshore area between the existing breakwaters; and
- repairs and extension of the existing seawall.

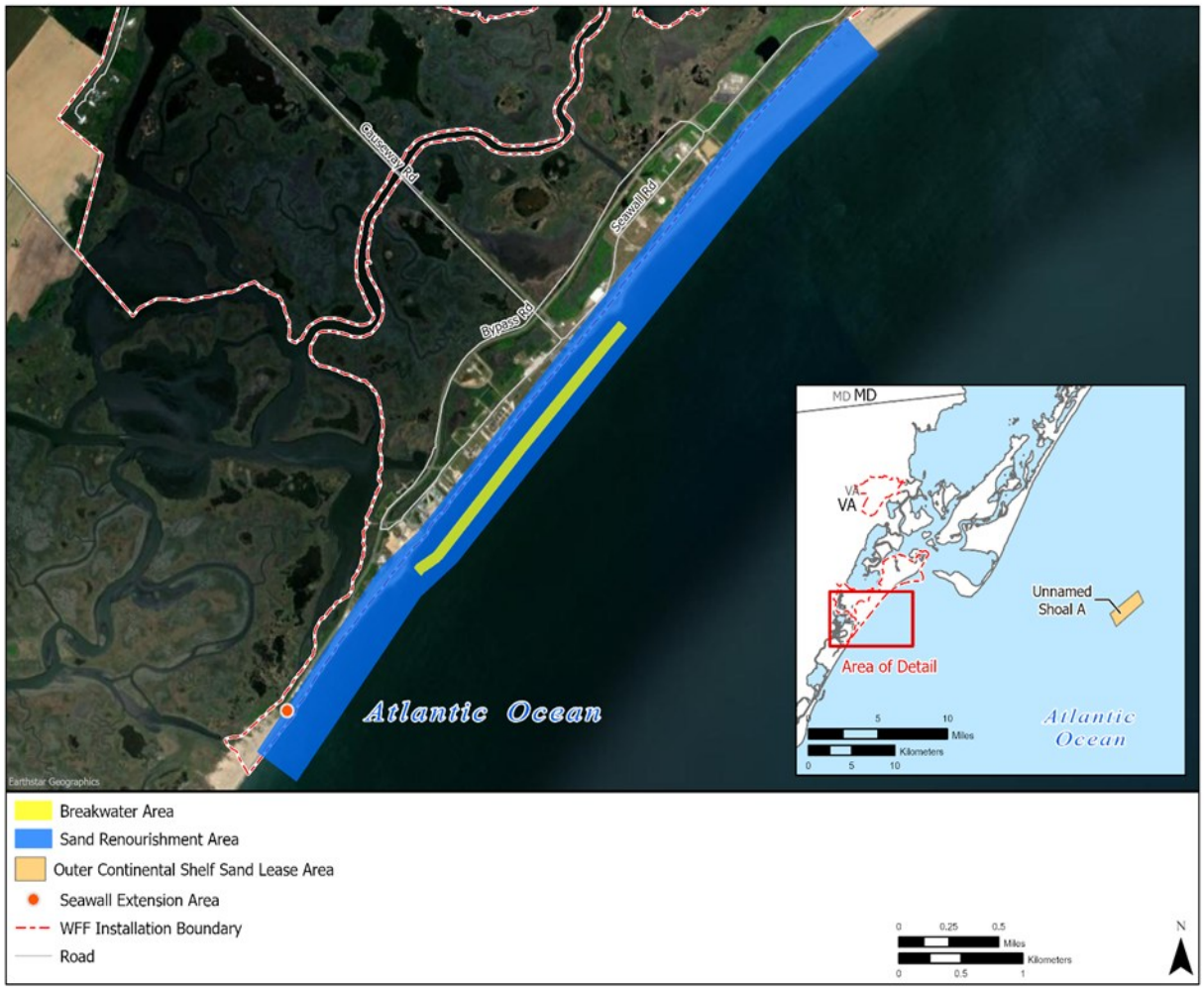

Figure 1 Project Area and Components

Activities would occur in phases depending on a number of factors, including infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding.

2.1 Dredging

Over the next 7 years, the beach along the Wallops Island shoreline infrastructure protection area would be renourished using up to 3 million cubic yards of sand sourced from Unnamed Shoal A. Because of overflow from the hopper dredge at the borrow site during dredging and losses during discharge and placement, a larger volume of material would need to be dredged to meet the targeted fill volume. Sediment losses during dredging and placement operations are assumed to be up to 50 percent, resulting in an estimated 4.5 million cubic yards dredged in order to renourish the beach with 3 million cubic yards of sand. The dredging and beach fill portion of the project would take approximately 3 months.

The renourishment processes (i.e., beach fill mobilization, dredging, and sand placement) would be consistent with the analyses described previously. The renourishment process would begin with the dredge contractor transporting equipment and materials to the project site. Offshore equipment would include several miles of discharge pipe, pump-out buoys, and multiple barges, tugboats, derricks, and smaller crew transportation vessels. It is expected that the discharge lines would be assembled inside the protected waters of Chincoteague Inlet, rafted together, and then positioned by mechanical means at their ultimate placement site, as weather conditions allow.

Offshore, the dredging process would be cyclical in nature, with the vessel transiting to the borrow site, lowering its drag arms (equipped with munitions and explosives of concern [MEC] screens and sea turtle deflectors), filling its hopper, and transporting the material to a pump-out station (the floating end of a submerged pipeline) that would be placed at a water depth of approximately 30 feet, approximately 2 miles offshore. The pathway from Unnamed Shoal A to the pump-out buoy avoids Chincoteague Shoal and Blackfish Bank. The one-way distance from Unnamed Shoal A to the pump-out buoy is approximately 14 miles. It is estimated that the pump-out station would be moved up to 10 times to accommodate transit by the dredge. Booster pumps may be needed to aid the offloading of sand from the pump-out buoy to the shoreline. The sand/water slurry would be pumped to the beach through several miles of submerged steel pipeline temporarily placed on the seafloor in areas previously cleared for cultural resources and/or on hardbottom. All dredging and equipment placement would take place in areas previously surveyed. Nearshore, it is expected that the contractor would employ one or more anchored pump-out stations

2.2 Beach Renourishment

Consistent with previous beach renourishment projects, onshore sections of discharge lines would be placed using a front-end loader or crane. As the sand slurry is discharged onto the shoreline, bulldozers would grade the material to the desired design template. Sand would be placed onshore along 15,000 feet of beach extending from just north of the southern property line to the north near the fire station. The tidal cycle would influence the location on the beach within which the equipment would work for a given dredge load. During low tide, the equipment would likely concentrate on the intertidal and subtidal zones, whereas, during high tide, work would be focused on the upper beach berm and dune. After each section of beach is confirmed to meet design criteria, the process would continue in the longshore direction, with sections of discharge pipe added as it progresses.

2.3 Breakwater Construction

Also over the next 7 years, up to 12 breakwaters would be constructed approximately 200 feet offshore between the two existing sets of breakwaters. Breakwaters would vary in height and width depending on the elevation of the sea bottom. Each breakwater would cover 11,000–12,000 square feet of bottom, for a total of up to approximately 144,000 square feet. Breakwaters could be placed in sets or individually. Breakwaters would be similar to those previously constructed with a layer of Type I Armor Stone, a center core of Virginia Department of Transportation (VDOT) Class II stone. Breakwaters may be placed on underlying 12-inch marine filter mattresses and/or a layer of geotextile fabric. The specific size, number, and placement of breakwaters would be a function of available funding, local conditions, and modeling by the USACE to determine maximum effectiveness while minimizing impacts to sediment transport and hydrodynamics in the project vicinity. Construction of each breakwater is estimated to take approximately 2 to 3 months. Breakwater construction could occur using several methods: via barge, temporary bulkheads, or temporary trestle system.

2.3.1 Building Breakwaters by Barge

The rock and other materials for constructing each breakwater would be transported to the breakwater construction area by barge or to the WFF area by rail, offloaded, and then barged to the handling or placement site offshore of Wallops Island. Placement would occur in the water using a barge and heavy lifting equipment.

2.3.2 Building Breakwaters Using Temporary Bulkheads

Materials and equipment would be transported to the WFF area by rail and offloaded to trucks or by truck to and from the island via existing roads to either an impervious surface or previously disturbed upland staging area. During construction, staging could move to the construction zone on the beach. Temporary bulkhead structures would be constructed using steel sheet piles. Each temporary bulkhead would be roughly 130 feet long by 30 feet wide and use approximately 1,000 cubic yards of temporary sand (same as used for beach fill).

2.3.3 Building Breakwaters Using Temporary Trestle System

Materials and equipment would be transported to the WFF area by rail and offloaded to trucks or by truck to and from the island via existing roads to either an impervious surface or previously disturbed upland staging area. During construction, staging could move to the construction zone on the beach. A series of steel pilings would be installed and beams placed across the top of the piles to form temporary trestles. The system would be 30 to 40 feet wide with crane mats used as decking.

2.4 Seawall Repair and Extension

The existing rock seawall is located along 15,900 feet of the Wallops Island shoreline. Construction of this seawall began in 1992. While the wall has prevented overwash and storm damage, erosion of the shoreline seaward of the wall has continued, resulting in an increased risk of damage to the seawall. The SRIPP analyzed potential effects from repairing and extending the seawall to a maximum length of 4,600 feet south of its southernmost point (NASA, 2010a). During the first SRIPP cycle, the seawall was extended approximately 1,430 feet south with the premise that the remaining 3,170-feet extension would be implemented with future funding. The seawall extension would consist of the placement of rocks weighing approximately 5 to 7 tons on a 1 to 1.5 slope. The top of the seawall would be approximately 14 feet above the normal high-tide water level after completion, depending on the extent of existing shoreline retreat at that

time. The seawall may be repaired at any location. Consistent with previous SRIPP consultations, this portion of the project would occur on land where species under NOAA Fisheries jurisdiction would not be present. No direct or indirect effects are expected and this project component will not be discussed further.

2.5 Mitigations and Monitoring

Dredging would be conducted in a manner consistent with the 2010 SRIPP BO (as amended). Specifically, NASA would at a minimum incorporate the following mitigation measures.

- Dredge offshore sand from Unnamed Shoal A sub-area A-1.
- Dredge over a large area and not create deep pits.
- Require that dredge cut depth not be excessive.
- Require that dredging not occur over the entire length of the shoal.
- Require MEC screening at the drag head.
- When utilizing MEC screening, NASA shall ensure that a lookout/bridge watch, knowledgeable in listed species identification, will be present on board the hopper dredge at all times to inspect the draghead each time it is removed from the water.
- If a listed whale is spotted within 1 kilometer (0.62 mile) of the dredge, stop dredging until the whale is farther than 1 kilometer from the dredge.
- All dredge operators will monitor the right whale sighting reports (i.e., sighting advisory system, dynamic management areas, seasonal management areas) to remain informed on the whereabouts of right whales within the vicinity of the action area.
- All dredge operators will conform to the regulations prohibiting the approach of right whales closer than 500 yards. Any vessel finding itself within the 500-yard buffer zone around a right whale must depart the area immediately at a safe, slow speed, unless one of the exceptions applies (see 50 Code of Federal Regulations 224. l 03 (c)).
- Should renourishment activities be scheduled between March 15 and August 31, NASA will ensure that a qualified biological monitor conducts daily surveys of the project site and adjacent areas to detect nesting sea turtles, in accordance with established and approved monitoring protocols.
- In accordance with WFF's Protected Species Monitoring Plan, if sea turtle nests are identified, the nests will be clearly marked using signage and rope barriers encircling each site. A qualified biological monitor will conduct daily nest inspections. All on-site personnel will be informed of the nesting status, and all project activities within 1,000 feet of a nest will be suspended or relocated until hatching is complete.
- Prior to initiation of on-site work, NASA will notify all prospective employees, operators, and contractors about the presence and biology of the plover, knot, and loggerhead; special provisions necessary to protect these species; activities that may affect these species; and ways to avoid and minimize these effects. NASA has developed a fact sheet containing this information
- Beach profile monitoring of the project site would continue to be conducted biannually, in the spring and fall (or as funding allows), of the previously constructed beach and breakwaters to monitor effectiveness.

3.0 Description of the Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 Code of Federal

Regulations section 402.02). The action area includes the Wallops Island offshore borrow sites, the waters between and immediately adjacent to these areas where project vessels would travel and dredged material would be transported, as well as an area extending 4,000 feet in all directions from the area to be dredged to account for the sediment plume generated during dredging activities. The action area also includes the portion of Wallops Island and the portion of Wallops Island shoreline and nearshore waters that would be affected by the extended seawall and beach fill (i.e., 3.7 miles of shoreline) as well as the portion of Atlantic Ocean from the edge of Wallops Island shoreline and adjacent to the outboard side of the proposed breakwater structures. As dredging operations would also produce underwater noise levels that range between 120–160 decibels relative to 1 micropascal (dB re 1µPa), the action area would also include the area around the dredge where effects of increased underwater noise levels would be experienced. Based on the analysis of dredge noise and transmission loss calculations, effects of dredge noise would be experienced within approximately 2,625 feet from the dredge during loading and pumping.

4.0 Status of Species within the Action Area

Table 1 lists the species that would be potentially affected by the project activities.

Table 1 Listed Species Which May Exist within the Action Area

Common Name	ESA Status	Previous Determination
Humpback whale *Megaptera novaeangliae*	Endangered	MA/NLAA
Fin whale *Balaenoptera physalus*	Endangered	MA/NLAA
North Atlantic right whale *Eubalaena glacialis*	Endangered	MA/NLAA
Hawskbill sea turtle *Eretmochelys imbricata*	Endangered	NE
Loggerhead sea turtle[1] *Caretta caretta*	Threatened	MA/NJ
Kemp's ridley sea turtle *Lepidochelys kempii*	Endangered	MA/NJ
Leatherback sea turtle *Dermochelys coriacea*	Endangered	MA/NLAA
Green sea turtle *Chelonia mydas*	Threatened	MA/NLAA
Atlantic sturgeon[2] *Acipenser oxyrhinchus oxyrhinchus*	Endangered	MA/NJ
Giant Manta Ray *Manta birostris*	Threatened	MA/NLAA

Key: ESA = Endangered Species Act; MA = may affect; NE = no effect; NJ = no jeopardy; NLAA = not likely to adversely affect

Notes: [1] Northwest Atlantic Ocean Distinct Population Segment
[2]Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic Distinct Population Segments

Consistent with previous shoreline restoration and stabilization projects, a determination of no effect is made the hawksbill sea turtle. Because the low likelihood of its presence in the project area and interaction with project components, it is not carried forward for detailed analysis.

The SRIPP BO (as amended) considered the effects of offshore dredging and beach renourishment on these listed species and included an ITS for those species that may be adversely affected, but not jeopardized, by the SRIPP. Specifically, the ITS exempts the take of nine sea turtles (eight loggerhead sea turtles and one Kemp's Ridley sea turtle) and two subadult

Atlantic sturgeon during these operations over the 50-year life of the SRIPP. These numbers were based on the volume of sand that would be removed from the borrow area during that project lifespan: one sea turtle injured or killed for every 1.6 million cubic yards and one Atlantic sturgeon injured or killed for every 9.4 million cubic yards.

4.1 Marine Mammals

The 2010 Final SRIPP PEIS described the marine mammals that may occur seasonally within the project area offshore of Wallops Island. Consistent with previous consultations, this includes right whales from November–May; humpback whales from September–April; and fin whales from October–January. It also noted that it is possible for individual transient whales to be present in the action area outside of these times as this area is used by whales moving between calving/mating grounds and foraging grounds.

4.2 Sea Turtles

In accordance with the Protected Species Monitoring Plan, NASA monitors sea turtle nesting (in conjunction with piping plover monitoring). If a nest is discovered, monitoring continues through November 30, or until the last hatchling leaves the nest. While NASA has observed loggerhead sea turtles and sea turtle nesting activity in the past, numbers are low, and some years have no observations of sea turtle nesting. From 1979 to 2008, a total of five loggerhead sea turtle nests occurred on Wallops Island, one in each year. Nesting occurred again in 2010, 2012, and 2013, and there were four, two, and two nests, respectively, for a total of eight nests with five false crawls. No loggerhead sea turtle nesting activity has occurred on Wallops Island since 2013. DNA analysis determined that all four nests in 2010 were dug by a single female loggerhead sea turtle (NASA, 2010b; USFWS, 2016). Historically, only loggerhead sea turtles have been found on Wallops Island (NASA, 2023).

The area offshore of Wallops Island is considered to be marginal as sea turtle habitat, and observations of sea turtles in these waters are infrequent. Protected species monitoring conducted by observers onboard the three dredges during the post-Sandy beach fill cycle reported no in-water sightings of listed species.

4.3 Atlantic Sturgeon

The Atlantic sturgeon is a subspecies of sturgeon distributed along the eastern coast of North America from Hamilton Inlet, Labrador, Canada to Cape Canaveral, Florida, United States. Populations of Atlantic sturgeon are categorized into the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic Distinct Population Segments (DPSs). Individuals from all the listed DPSs may occur in the action area.

A study by BOEM passively monitored telemetered fish in the Sandbridge Shoal Marine Minerals Lease Area off the southeast coast of Virginia, south of Unnamed Offshore Shoal A, from 2016 to 2019. Atlantic sturgeon were the most commonly detected fish, with detections ranging from 109 to 134 individuals per year and occurring on between 96 and 103 days per year. Detections varied greatly by month with the fewest from June to September (no detections in July and August) and the largest number of detections in March–April and November–December (BOEM, 2024).

4.4 Giant Manta Ray

The giant manta ray was listed as threatened in January 2018. Giant manta rays are slow-growing, migratory animals with small, highly fragmented populations that are sparsely

distributed across the world. It is the world's largest ray with a wingspan of up to 29 feet and can weigh up to 5,300 pounds. It is found worldwide in tropical, subtropical, and temperate bodies of water and is commonly found offshore, in oceanic waters, and near productive coastlines. It has been found in waters as cool at 66 degrees Fahrenheit and has been observed in estuarine waters near oceanic inlets (NOAA, 2021). Giant manta rays primarily feed on planktonic and nektonic species throughout the water column, not benthic, organisms. During feeding, giant manta rays may be found aggregating in shallow waters at depths less than 33 feet; however, tagging studies have also shown that the species conducts dives of up to 650 to 1,500 feet and is capable of diving to depths exceeding 3,200 feet. This diving behavior may be influenced by season and shifts in prey location associated with the thermocline (NOAA, 2021). There is the potential for giant manta rays to be within the offshore borrow area during the summer months

5.0 Effects of the Action on Listed Species

Because the effects of the proposed activities have been evaluated in detail previously, the following sections provide a summary of effects. The activities proposed at this time have been assessed previously in the SRIPP BO (as amended) and in subsequent coordination as follows.

- Dredging sand from Unnamed Offshore Shoal A, moving it as a slurry via pipeline to the Wallops Island beach, and using heavy equipment on the beach to grade the sand into a desired design template were evaluated in 2010, 2012, and 2014 and effects determinations were provided in the SRIPP BO (as amended).
- Construction of offshore breakwaters was evaluated in a 2018 Biological Assessment. In a letter dated November 20, 2018, NOAA Fisheries determined that it was not necessary to reinitiate the consultation on the SRIPP BO.
- In 2020, NASA requested NOAA Fisheries concurrence that constructing breakwaters via temporary bulkheads perpendicular to the shoreline would result in no additional effects to protected species. On October 2, 2020, NOAA Fisheries provided its concurrence via email and stated that reinitiation of consultation was not required.

5.1 Dredging

Consistent with the SRIPP BO, potential effects of dredging include entrainment of sea turtles and Atlantic sturgeon (other species would not be susceptible and/or would not be expected to be present); alteration of sea turtle and Atlantic sturgeon foraging habitat; Atlantic sturgeon, giant manta rays, and sea turtle interaction with suspended sediment; injury to Atlantic sturgeon, giant manta rays, sea turtles, or whales from underwater noise generated during dredging operations; and collisions between whales, Atlantic sturgeon, giant manta rays, or sea turtles and project vessels.

5.1.1 Entrainment

During sand harvest, it is possible that turtles, particularly loggerhead and Kemp's ridley sea turtles, would become entrained in the dredge as described in previous consultation documents. Entrainment of green sea turtles is extremely unlikely because of their low numbers in the action area. Green sea turtles forage in seagrass beds, which do not exist in the borrow area, and leatherback sea turtles forage on jellyfish in the water column, thus these species are not likely to interact with the draghead. Loggerheads are the most numerous sea turtles in the area and tend to forage on the bottom, therefore are most likely to become entrained. However, the probability of interaction is very low because turtle numbers in the area are low. It is anticipated that over the life of the project, up to nine sea turtles could be killed, with no more than one being a Kemp's

ridley and the remainder being loggerheads.

Similarly, it is possible that subadult sturgeon would become entrained in the dredge as described in previous consultation documents (adults are too large to become entrained in draghead openings). No change to methodology is proposed that would affect this and the possibility persists. Entrainment of large mobile animals, such as sturgeon, is relatively rare, particularly in the open ocean where individuals' movements would not be restricted (as may be the case in a river channels). Additionally, Atlantic sturgeon density in the action area is expected to be low and migrating individuals would occur higher in the water column away from the draghead. Therefore, NOAA Fisheries estimated that the likelihood of interaction of an Atlantic sturgeon with a dredge operating under the SRIPP may lead to up to two subadult Atlantic sturgeon being killed.

5.1.2 Foraging Habitat Alternation

Removal of sediments from Unnamed Shoal A would affect infauna, as well as species which prey upon them. Green sea turtles forage in seagrass beds, which do not exist in the borrow area, and leatherback sea turtles forage on jellyfish in the water column, thus no effects from foraging habitat alteration are anticipated. The borrow area is not known to be an area where Kemp's ridley or loggerhead sea turtles or Atlantic sturgeon congregate; dredging could affect turtle and sturgeon prey items. Given the small area affected by the proposed activities relative to abundant adjacent habitats and the ability of turtles to exploit food sources over a large area, these effects would be minor and discountable.

5.1.3 Suspended Sediment Effects

Dredging operations cause sediment to be suspended in the water column as dragheads are pulled through the sediment, turbulence is generated by the vessel, and from overflow of turbid water during hopper filling. Suspended solid concentrations would be lower than levels considered toxic to fish. The most likely effect of suspended sediments would be to alter behaviors of whales, sea turtles, Atlantic sturgeon, or giant manta rays as these highly mobile species alter movement to avoid sediment plumes. Such movements are likely to be insignificant.

5.1.4 Underwater Noise

Dredging operations would result in noise from vessel activities. Marine animals may have behavioral and physiological reactions to underwater noise but responses would typically be brief. An increase in background vessel noise levels has the potential to expose Atlantic sturgeon, giant manta rays, sea turtles, or whales to sound and general disturbance, potentially resulting in short-term behavioral reactions such as avoidance response and masking. These species are more likely to react to nearby vessel noise (i.e., within tens of meters) than to noise from a distant vessel. Maximum noise levels from the vessel would be well below those that would cause injury to Atlantic sturgeon, giant manta rays, sea turtles, or whales, and effects on behaviors would be discountable. Existing mitigations including maintaining buffers and turning off pumps when whales are sited would reduce the likelihood that whales are exposed to excessive underwater noise. Limiting vessel speeds would make it possible for individuals to avoid vessel activity.

5.1.5 Vessel Collision

Though vessel collision could occur, strike is more likely to occur in areas with high levels of vessel traffic and/or high species density. Existing mitigations including maintaining buffers, posting lookouts, and limiting vessel speeds would lower the possibility of collisions with project

vessels. This, coupled with the ability of species to detect and avoid vessels, reduces the likelihood of vessel collisions with whales, Atlantic sturgeon, giant manta rays, or sea turtles to discountable levels.

5.2 Beach Renourishment

Potential effects of beach renourishment include alteration of sea turtle and Atlantic sturgeon foraging habitat, sea turtle nesting habitat, and interaction with suspended sediment.

5.2.1 Foraging Habitat Alternation

Green and leatherback sea turtles are unlikely to forage in nearshore area of Wallops island as appropriate habitat and prey items do not occur here. Loggerhead and Kemp's ridley sea turtles could use nearshore areas for feeding as could Atlantic sturgeon. Benthic prey items in the renourishment area would be buried during beach renourishment resulting in the temporary loss of foraging habitat. Given the small area affected by the proposed activities relative to abundant adjacent habitats and the ability of turtles to exploit food sources over a large area, these effects would be minor and discountable. It is expected that recolonization of the nearshore benthos will occur within 2-6 months after each renourishment cycle is complete. Additionally, the placement of sand seaward of the existing seawall, where currently limited or no beach area exists, would have beneficial effects on benthic organisms by restoring and creating new beach habitat and providing additional sources of prey along the Wallops Island shoreline.

5.2.2 Turtle Nesting Habitat Alteration

Impacts to nesting sea turtles could include avoided nesting attempts due to construction activity (noise, artificial lighting) on the beach, disorientation of hatchlings (due to project-related light sources), obstruction to hatchlings during their emergence and subsequent trip to the ocean, or loss of beach habitat. However, sea turtle nesting occurred on the new Wallops Island dune during the initial beach fill, indicating that it is very possible that the renourished elevated beach would provide additional sea turtle nesting habitat, a net benefit to the species.

5.2.3 Suspended Sediment Effects

As described above for dredging, sand placement on the Wallops Island beach would cause sediment to be suspended in the water column. Suspended solid concentrations would be lower than levels considered toxic to fish. The most likely effect of suspended sediments would be to alter behaviors of whales, sea turtles, or fish as these highly mobile species alter movement to avoid sediment plumes. Such movements are likely to be insignificant.

5.3 Breakwater Construction

Potential effects of breakwater construction include sea turtle, giant manta ray, and Atlantic sturgeon interaction with suspended sediment; injury from noise generated during operations; alteration of sea turtle and Atlantic sturgeon foraging habitat; and alteration of sea turtle nesting habitat. Whales and manta rays are not expected to be present in the areas close to shore where breakwater construction is proposed. These species are highly mobile and could avoid the area. Therefore, no deleterious effects would be expected.

5.3.1 Suspended Sediment Effects

As described above for dredging and beach renourishment, breakwater construction could result in a temporary increase in suspended sediments, which could affect turtles and Atlantic sturgeon close to shore. Impacts would be similar to those described above.

5.3.2 Underwater Noise

Breakwater construction-related stressors include disturbance from vessel noise (if breakwaters are constructed from offshore) or non-impulsive pile driving (if breakwaters are constructed from shore via temporary bulkheads or trestles). A number of factors may influence an animal's response to noise, including its previous experience, its auditory sensitivity, its biological and social status (including age and sex), and its behavioral state and activity at the time of exposure. NOAA Fisheries reviewed studies of hearing sensitivity of marine mammals and developed thresholds for use as guidance when assessing the effects of anthropogenic sound on marine mammals based on measured or estimated hearing ranges (NMFS, 2024); however, listed whales are not expected to be present near the shore where such activities may occur.

Thresholds have also been developed for sea turtles based on auditory sensitivity in marine mammals. Construction of breakwaters could cause disturbance to sea turtles area avoidance. Noise from the installation of steel sheet piling using a vibratory hammer, if that method were used to install breakwaters (which is estimated to be as high as 163 decibels) may affect sea turtles. **Table 2** illustrates the sound thresholds for causing effects to sea turtles (Navy, 2017, 2018) and distances from the noise source (steel sheet pile being driven by a vibratory hammer) for those effects to occur. Outside these distances, effects would not occur. Additionally, noise dampening would be expected as sound waves encounter shallow bottom sediments and would be masked by the sound of crashing surf. Given that breakwater construction activities would occur fairly close to shore, noise levels would fall below those that could cause permanent or temporary threshold shifts (hearing impacts) or behavior changes, it is unlikely that sea turtles would experience effects from underwater noise.

Table 2 Auditory Injury and Behavioral Thresholds for Sea Turtles Exposed to Non-Impulsive Sounds

Effect	Weighted SPL Threshold re µPa2•s	Distance (feet)
Permanent Threshold Shift	220 dB SEL_{cum}	2
Temporary Threshold Shift	200 dB SEL_{cum}	42
Behavioral Change	175 dB RMS	6.6

Key: µPa = microPascal; µPa2•s = microPascal squared per second; dB = decibel; re = referenced to; RMS = root mean square; SPL = sound pressure level; SEL_{cum} = cumulative sound exposure level over 24 hours, weighted for turtle hearing group based on formula in Navy 2017

Current acoustic thresholds define behavioral disturbance to fish from all source types at 150 dB RMS. If a sturgeon were present in the study area and exposed to noise sufficient to create a behavioral response, it would modify its behavior and move away from the affected area prior to incurring injury. Although ESA-listed fish species could be affected by noise and disturbance, the probability would be decreased due to the low potential for occurrence in the study area. While Atlantic sturgeon may not always necessarily change their trajectory due to noise from vessels or pile driving, this species is highly mobile and an individual within the vicinity would be expected to alter its movement and avoid the area. Underwater noise from breakwater construction will be temporary and localized, and is unlikely to affect Atlantic sturgeon movements or ability to access habitat. Additionally, Atlantic sturgeon density in the action area is expected to be low, and any individuals transiting the study area would be able to avoid vessels and pile activity.

5.3.3 Foraging Habitat Alternation

Loggerhead and Kemp's ridley sea turtles could use nearshore areas for feeding as could Atlantic sturgeon. Benthic prey items in the renourishment area would be buried during beach renourishment resulting in the temporary loss of foraging habitat. Given the small area affected by the proposed activities relative to abundant adjacent habitats and the ability to exploit food sources over a large area, these effects would be minor and discountable. It is expected that recolonization of the nearshore benthos would occur within 2 to 6 months after each renourishment cycle is complete. Additionally, the placement of sand seaward of the existing seawall, where currently limited or no beach area exists, would have beneficial effects on benthic organisms by restoring and creating new beach habitat and providing additional sources of prey along the Wallops Island shoreline.

5.3.4 Turtle Nesting Habitat Alteration

Impacts to nesting sea turtles could include avoided nesting attempts due to construction activity (noise, artificial lighting) on the beach, disorientation of hatchlings (due to project-related light sources), obstruction to hatchlings during their emergence and subsequent trip to the ocean, or loss of beach habitat. However, sea turtle nesting occurred on the Wallops Island dune during the initial beach fill, indicating that it is very possible that the renourished elevated beach would provide additional sea turtle nesting habitat, a net benefit to the species.

Beach stabilization measures such as renourishment and hard structures provide not only increased beach width for shore protection but also may provide increased "real estate" of sea turtle nesting habitat that would otherwise be unavailable due to erosion (USACE, 2022). However, hard structures can affect adjacent beaches by modifying coastal sediment transport processes (USACE, 2022). Coastal modifications (e.g., beach armoring, beach sand placement, sand fencing) and associated pressures (e.g., artificial lighting, human disturbance, noise, beach compaction) may change beach morphology, nesting area availability and the incubating environment of marine turtle eggs (Nelson Sella and Fuentes, 2019). Because marine turtles rely on sandy coasts for reproductive purposes, impacts can affect individual species directly or can act indirectly on their habitat so that it becomes unsuitable for resting or reproduction (Nelson Sella and Fuentes, 2019).

Beach stabilization measures can affect sea turtles by preventing access to suitable nesting sites, impeding and/or trapping nesting females, abandoning nesting attempts, preventing proper nest construction, and overall loss of nesting habitat due to long term beach erosion (USACE, 2022). A 2025 study found that despite a general increase in sea turtle nest numbers, a marked decrease was observed in the study area landward of the breakwaters, demonstrating that breakwaters may effectively impact the ingress and egress of nesting sea turtles, as well as the egress of hatchlings (Casale et al., 2025). This indicates that breakwaters represent a barrier for nesting females that may nest elsewhere, either in the same or in a different coastal tract. This would result in a decrease in nest density landward of the breakwaters and an increase in other areas free of breakwaters. This pattern would be expected even if breakwaters do not act as physical barriers but instead alter beach characteristics in ways that make nesting more difficult (Casale et al., 2025). In the long term, the longshore transport would be altered by the breakwaters and may enhance or denigrate nesting habitat for sea turtles on Wallops Island.

Aside from the physical obstruction of the breakwater blocking access to the beach for the mother and the open ocean for both the mother and emergent hatchlings, the structures can redirect the direction of the turtles and possibly point them towards a light source. However,

light disorientation impacts can be minimized by reducing the wattage of light sources, altering the direction of light sources by shielding or lowering the light elevation, and using lights with spectral properties (longer wavelengths) that are less disruptive to sea turtles (USACE, 2022).

6.0 Effects Determination

Based on the discussion above, NASA has made determinations of effects resulting from components of the proposed action on ESA-listed marine species (**Table 3**).

Table 3 Effects Determinations

	Dredging	Beach Renourishment	Breakwater Construction
Humpback whale	NLAA	NE	NE
Fin whale	NLAA	NE	NE
North Atlantic right whale	NLAA	NE	NE
Hawskbill sea turtle	NE	NE	NE
Loggerhead sea turtle	MA/NJ	NLAA	NLAA
Kemp's ridley sea turtle	MA/NJ	NLAA	NLAA
Leatherback sea turtle	NLAA	NLAA	NLAA
Green sea turtle	NLAA	NLAA	NLAA
Atlantic sturgeon	MA/NJ	NLAA	NLAA
Giant Manta Ray	NLAA	NLAA	NLAA

Key: MA= may affect; NJ = no jeopardy; NLAA = may affect not likely to adversely affect; NE = no effect

7.0 Conclusion

During the preparation of the 2010 SRIPP PEIS, the 2013 Hurricane Sandy EA, and the 2019 SERP EA, NASA consulted with NOAA Fisheries regarding potential effects on listed species and critical habitat NOAA Fisheries offered a revised BO in August of 2012 and confirmed in 2018 and 2020 that reinitiation was not warranted.

In consideration of the scope of the proposed project, listed species known to inhabit the project area, the potential effects on those species, and mitigation measures to be implemented, NASA has made the determinations listed in **Table 3**. Over the next 7 years, this project may involve an estimated total amount of4.5 million cubic yards of sand harvested with a MEC screen, placement and grading of sand on Wallops Island beach, construction of up to 12 detached breakwaters, as well as repair and extension of the seawall. The proposed action is similar to that considered in previous consultations. In light of the mitigation procedures that would be implemented to avoid affecting threatened and endangered species, NASA concludes that reinitiating formal ESA consultation is not necessary. NASA requests NOAA Fisheries concurrence with this determination.

If you have any questions or require additional information, please contact Ms. Lori Levine at (301) 286-6741 or lori.m.levine@nasa.gov.

Sincerely,

Shari Miller
Environmental Planning Group Lead
Medical and Environmental Management Division
cc:
228/W. Harris
228/J. Saecker
250/B. Deyo
250/L. Levine
BOEM/L. Brandt
BOEM/J. Bucatari
NOAA/B. Hopper
USACE/S. Reinheimer
USACE/S. Williams

References

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National Aeronautics and Space Administration

Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

Reply to Attn of: 250.W

March 3, 2026

Julie Crocker
Acting Assistant Regional Administrator
Protected Resources Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Ms. Crocker:

Regarding the Biological Evaluation for the NASA Wallops Flight Facility Shoreline Protection Program Environmental Assessment, which was submitted via email on January 20, 2026 from Lori Levine, Water Quality, Oil Operations, and Natural Resources Programs at NASA's Goddard Space Flight Center.

Updated information has become available that requires the following changes based on refined designs and planning:

- the maximum number of breakwaters constructed over the next 7 years is 6;
- the footprint of a single breakwater would be 16,000-18,000 square feet; and
- breakwaters would be constructed with a 9-foot layer of Type II Armor Stone and center core of Virginia Department of Transportation Class III stone.

These modifications to the proposed action do not change our determination of effect. We respectfully request that you consider these changes in your evaluation and response.

If you have any questions or require additional information, please contact Ms. Lori Levine at (301) 286-6741 or lori.m.levine@nasa.gov.

Sincerely,

Shari Miller
Environmental Planning Group Lead

cc:
228/W. Harris
228/J. Saecker
250/B. Deyo
250/L. Levine
BOEM/L. Brandt
BOEM/J. Bucatari
NOAA/B. Hopper
USACE/S. Reinheimer
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BOEM. 2024. Spatiotemporal Distributions of Species Detected within Virginia's Offshore Lease Areas Volume 1: Sandbridge Shoal Marine Minerals Lease Area. Available online: https://espis.boem.gov/final%20reports/BOEM_2024-071.pdf. Accessed October 22, 2025.

Casale, P., S.A. Ceriani, A. Mastrogiacomo, S. Demetropoulos, M. Marcou, and A. Demetropoulos. 2025. Breakwaters Impact Marine Turtle Nesting Activity. *Endangered Species Research*, Volume 58, pp. 43-47.

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Navy. 2017. Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing. Naval Undersea Warfare Center Division, Newport, Rhode Island. NUWC-NPT Technical Report 12,242. June 16.

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Nelson Sella, Kristen A. and Mariana M.P.B. Fuentes. 2019. Exposure of Marine Turtle Nesting Grounds to Coastal Modifications: Implications for Management. *Ocean and Coastal Management* 169, pp. 182–190.

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USFWS. 2016. Revised Biological Opinion Wallops Flight Facility Proposed and Ongoing Operations and Shoreline Restoration. June.

From: Brian D Hopper - NOAA Federal
To: Levine, Lori (GSFC-2500)
Subject: Re: [EXTERNAL] Re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE for NOAA Fisheries - Errata Letter
Date: Wednesday, April 15, 2026 7:42:04 AM
Attachments: image001.png
image002.png

Hi Lori,

Thank you for providing the documentation describing the proposed shoreline enhancement and restoration project at Wallops Island, Virginia. I've reviewed the information attached to your emails requesting a determination from us regarding consultation. Based on the effect analysis from the previous consultation on the project, the information you provided regarding changes to the project description, and the fact that no new listed species or designated critical habitat overlap with the action area, it is not necessary to re-initiate consultation on the August 3, 2012 Biological Opinion on the Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (as amended, September 26, 2014). Please let me know if you have any questions.

Regards,
-Brian

On Tue, Apr 14, 2026 at 3:33 PM Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov> wrote:

> Brian,
>
> Yes, it is. Thanks for getting back to me.
>
> Best,
>
> **Lori Levine**
>
> **Water Quality, Oil Operations, and Natural Resources Programs**
>
> NASA's Goddard Space Flight Center
>
> Environmental Management Division, Code 250
> o: (301) 286-6741
> **Chat with me on Teams**
>
> ---
>
> **From:** Brian D Hopper - NOAA Federal <brian.d.hopper@noaa.gov>
> **Sent:** Tuesday, April 14, 2026 2:32 PM

To: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>
Subject: [EXTERNAL] Re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE for NOAA Fisheries - Errata Letter

Hi Lori,

Is this project part of the Wallops,Island Shoreline Restoration and Infrastructure Protection Program?

-Brian

On Tue, Apr 14, 2026 at 11:32 AM Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov> wrote:

> Good morning, Brian,
>
> I wanted to check in with you regarding your review of the Shoreline BE. Please let me know if you have any questions or need anything further from me.
>
> Best,
>
> **Lori Levine**
>
> **Water Quality, Oil Operations, and Natural Resources Programs**
>
> NASA's Goddard Space Flight Center
>
> Environmental Management Division, Code 250
> o: (301) 286-6741
> **Chat with me on Teams**
>
> ---
>
> **From:** Levine, Lori (GSFC-2500)
> **Sent:** Wednesday, March 4, 2026 9:52 AM
> **To:** 'Brian D Hopper - NOAA Federal' <brian.d.hopper@noaa.gov>
> **Cc:** Harris, William S. (WFF-2280) <william.s.harris@nasa.gov>; Saecker, John R. (WFF-2280)

<john.r.saecker@nasa.gov>; Deyo, Brendan G. (GSFC-LD020) <brendan.g.deyo@nasa.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>; Brandt, Leighann B <leighann.brandt@boem.gov>; jennifer.bucatari@boem.gov; shannon.j.reinheimer@usace.army.mil; Williams, Shadera M CIV USARMY CENAO (USA) <shadera.m.williams@usace.army.mil>; Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Elizabeth Pruitt <elizabeth.pruitt@cardno-gs.com>; julie.crocker@noaa.gov
Subject: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE for NOAA Fisheries - Errata Letter

Good morning, Brian,

Please see the attached letter to further clarify the number of breakwaters expected to be constructed in this effort. Let me know if you have any questions.

Best,

Lori Levine

Water Quality, Oil Operations, and Natural Resources Programs

NASA's Goddard Space Flight Center

Medical & Environmental Management Division, Code 250
o: (301) 286-6741
Chat with me on Teams

From: Brian D Hopper - NOAA Federal <brian.d.hopper@noaa.gov>
Sent: Wednesday, January 21, 2026 9:43 AM
To: Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov>
Cc: Harris, William S. (WFF-2280) <william.s.harris@nasa.gov>; Saecker, John R. (WFF-2280) <john.r.saecker@nasa.gov>; Deyo, Brendan G. (HQ-LD020) <brendan.g.deyo@nasa.gov>; Miller, Shari (LARC-2500) <shari.a.miller@nasa.gov>; Brandt, Leighann B <leighann.brandt@boem.gov>; jennifer.bucatari@boem.gov; shannon.j.reinheimer@usace.army.mil; Williams, Shadera M CIV USARMY CENAO (USA) <shadera.m.williams@usace.army.mil>; Romero, Irene J. (GSFC-2500) <irene.j.romero@nasa.gov>; Elizabeth Pruitt <elizabeth.pruitt@cardno-gs.com>
Subject: [EXTERNAL] Re: NASA WFF Shoreline Restoration and Infrastructure Protection Program BE for NOAA Fisheries

Got it! Thanks, Lori! I'll take a look and let you know if I have any questions.

On Tue, Jan 20, 2026 at 4:01 PM Levine, Lori (GSFC-2500) <lori.m.levine@nasa.gov> wrote:

> Dear Ms. Crocker:
>
> The attached correspondence serves as the National Aeronautics and Space Administration's (NASA's) notification to the National Oceanic and Atmospheric Administration (NOAA) Fisheries of its proposed Shoreline Protection Program at Wallops Flight Facility (WFF), Wallops Island, Virginia. This project tiers to the 50-year Shoreline Restoration and Infrastructure Protection Program (SRIPP). The Proposed Action is to perform additional beach renourishment, breakwater construction, and/or seawall repair and extension to protect the beach along the Wallops Island shoreline infrastructure protection area. NASA requests NOAA Fisheries concurrence with the effects determination outlined in the attached.
>
> An electronic version of the draft Shoreline Protection Environmental Assessment and fact sheet are located on the project website at https://www.nasa.gov/goddard/memd/nepa/shoreline/. Please contact me with any questions.
>
> Sincerely,
>
> **Lori Levine**
>
> **Water Quality, Oil Operations, and Natural Resources Programs**
>
> NASA's Goddard Space Flight Center
>
> Medical and Environmental Management Division, Code 250
> o: (301) 286-6741
>
> Chat with me on Teams

General Environmental Contacts:

Greenbelt: gsfc-dl-enviro@mail.nasa.gov

Wallops: wff-dl-enviro@mail.nasa.gov

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Appendix G
Cultural Resources Consultation

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National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Julie Langan
State Historic Preservation Officer
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Ms. Langan,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, U.S. Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

NASA has determined that the proposed project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and it is a type of activity that has the potential to cause effects on historic properties. NASA has prepared an Environmental Assessment to evaluate the potential environmental effects of both enhancing and protecting the shoreline on

Wallops Island with the proposed Federal action alternatives. The Shoreline Protection Program (SPP) Tiered EA has been prepared by NASA in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code [U.S.C.] 4321-4347); NASA procedures for implementing NEPA (14 CFR 1216.3); and NASA Procedural Requirement (NPR) *Implementing the National Environmental Policy Act and Executive Order 12114* (NPR 8580.1). The U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) and U.S. Army Corps of Engineers (USACE), Norfolk District are Cooperating Agencies with NASA serving as the lead agency.

The purpose of this letter is to initiate consultation pursuant to the terms of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800. This letter serves to define the Area of Potential Effects (APE) for the undertaking and gauge project effects located within the bounds of the proposed undertaking.

Description of Undertaking

Consistent with the Action Alternatives described in detail in the 2010 Final SRIPP PEIS (NASA 2010), reexamined in the 2013 Final Post-Hurricane Sandy EA (NASA 2013), and implemented following completion of the 2019 Final Shoreline Enhancement and Restoration Project EA (NASA 2019), NASA's proposed undertaking would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The undertaking could involve a combination of sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station; breakwater construction nearshore between existing sets of breakwaters; as well as repairs and extension of the existing seawall. Shoreline stabilization activities could occur in phases depending on a number of factors including: infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction or both could occur in another area. Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post- dredging surveys) under the proposed undertaking would be consistent with those described in detail in previous NEPA (NASA 2010; NASA 2013; NASA 2019). For this proposed undertaking, sand material for beach renourishment would come from Outer Continental Shelf (OCS) Unnamed Shoal A. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019).

No Action Alternative

Under the No Action Alternative, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and sea level rise; or repair or extend the existing seawall.

Area of Potential Effects (36 CFR § 800.4(a)(1))

An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this undertaking, NASA determined that the APE includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

Pursuant to the NHPA, Section 106 Implementing Regulations at 36 CFR § 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's APE in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Two archaeological surveys were completed to investigate the APE for the *2010 Final SRIPP PEIS*. In 2009, an investigation of the proposed groin, breakwater, and shoreline that would be impacted by the SRIPP project was completed. This investigation included pedestrian survey of the Wallops Island shoreline, archaeological monitoring of the installation of geotextile tubes along the shoreline, a diving survey of the proposed groin location, and a remote sensing survey of the proposed breakwater area. The investigation did not identify any archaeological resources in the areas and no additional work was recommended (Randolph *et al*. 2009). The second investigation for the *2010 Final SRIPP PEIS* was conducted in 2010. This survey investigated the proposed offshore sand borrow areas using underwater remote sensing. No underwater archaeological resources were identified during the survey and no additional work was recommended for the borrow area (Randolph *et al.* 2010).

No previously identified archaeological sites are located in the APE for the project. Three previously identified archaeological sites are located on Wallops Island in the vicinity of the APE. The Military Earthworks site (44AC0089) is a Revolutionary War gun emplacement located at the northern end of Wallops Island. The site was subjected to additional investigations and recommended eligible for listing in the NRHP. Site 44AC0159 is an unnamed site located at the southern end of Wallops Island. The site is described as a shell pile or shell midden and has been determined not eligible for listing in the NRHP. Site 44AC0459 is a trash scatter associated with the Coast Guard Life Saving Station and Observation Tower. This site was also determined not eligible for the NRHP (NASA 2022a).

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the steps outlined in Stipulation XII, *Post Review Discoveries*, of the executed 2014 Programmatic Agreement (NASA 2014, 2022).

Conclusion

NASA has determined that the implementation of the undertaking warrants a finding of ***No Historic Properties Affected*** per 36 CFR Section 800.4(d)(1). NASA invites you to comment on this undertaking and our determination of effects. In addition to your office, NASA is consulting with Tribal Nations who may have cultural and/or historical interests in the area.

Please respond within thirty (30) days of receipt of this letter to Irene Romero at irene.j.romero@nasa.gov. Thank you for your assistance.

Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

1- Map depicting the location of Wallops Flight Facility, Wallops Island, Virginia
2- Map showing the Area of Potential Effects
3- References Cited

Enclosures

Enclosure 1 – Map of Wallops Island

Map 1. Location of Wallops Flight Facility's, Wallops Island

Enclosures

Enclosure 2 – Map of APE

Map 2. Area of Potential Effects

Enclosures

Enclosure 3 – References Cited

National Aeronautics and Space Administration (NASA). 2010. Final Programmatic Environmental Impact Statement for Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Programs. October. Available online at: https://code200-external.gsfc.nasa.gov/250-wff/programmatic-environmental-impact-statement-shoreline-restoration-and-infrastructure-protection

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NASA. 2019. Final Environmental Assessment. NASA Wallops Flight Facility Shoreline Enhancement and Restoration Project. June. Available online at: https://code200-external.gsfc.nasa.gov/250-WFF/serp-ea

NASA. 2025. Programmatic Agreement Among the National Aeronautics and Space Administration, the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers Regarding the Management of NASA Centers. October 21, 2025. Available at executed-nasa-npa-21oct2025.pdf

Randolph, A., J.B. Pelletier, B. Johnson, and G. Brooks. 2009. Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program: Proposed Groin, Breakwater, and Shoreline Cultural Resource Surveys, Accomack County, Virginia. Prepared by URS for Goddard Space Flight Center's Wallops Flight Facility National Aeronautics and Space Administration. Wallops Island, Virginia.

Randolph, A., J.B. Pelletier, B. Johnson, and G. Brooks. 2010. National Aeronautics and Space Administration Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program: Cultural Resource Survey Remote Sensing Survey of two Proposed Offshore Sand Borrow Locations in Federal Waters. Prepared by URS for Goddard Space Flight Center's Wallops Flight Facility National Aeronautics and Space Administration. Wallops Island, Virginia.

National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Wenonah Haire, DMD
Tribal Historic Preservation Officer
Catawba Indian Nation
1536 Tom Steven Road
Rock Hill, SC 29730

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Ms. Haire,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

NASA has determined that the proposed project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and it is a type of activity that has the potential to cause effects on historic properties. NASA has prepared an Environmental Assessment to evaluate the potential environmental effects of both enhancing and protecting the shoreline on Wallops Island with the proposed Federal action alternatives. The Shoreline Protection Program (SPP) Tiered EA has been prepared by NASA in accordance with the requirements of the

National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code [U.S.C.] 4321-4347); NASA procedures for implementing NEPA (14 CFR 1216.3); and NASA Procedural Requirement (NPR) *Implementing the National Environmental Policy Act and Executive Order 12114* (NPR 8580.1). The U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) and U.S. Army Corps of Engineers (USACE), Norfolk District are Cooperating Agencies with NASA serving as the lead agency.

The purpose of this letter is to initiate consultation pursuant to the terms of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800. This letter serves to define the Area of Potential Effects (APE) for the undertaking and gauge project effects located within the bounds of the proposed undertaking.

Description of Undertaking

Consistent with the Action Alternatives described in detail in the 2010 Final SRIPP PEIS (NASA 2010), reexamined in the 2013 Final Post-Hurricane Sandy EA (NASA 2013), and implemented following completion of the 2019 Final Shoreline Enhancement and Restoration Project EA (NASA 2019), NASA's proposed undertaking would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The undertaking could involve a combination of sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station; breakwater construction nearshore between existing sets of breakwaters; as well as repairs and extension of the existing seawall. Shoreline stabilization activities could occur in phases depending on a number of factors including: infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction or both could occur in another area. Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post- dredging surveys) under the proposed undertaking would be consistent with those described in detail in previous NEPA (NASA 2010; NASA 2013; NASA 2019). For this proposed undertaking, sand material for beach renourishment would come from Outer Continental Shelf (OCS) Unnamed Shoal A. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019).

No Action Alternative

Under the No Action Alternative, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and sea level rise; or repair or extend the existing seawall.

Area of Potential Effects (36 CFR § 800.4(a)(1))

An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various

kinds of effects caused by the undertaking. For this undertaking, NASA determined that the APE includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

Pursuant to the NHPA, Section 106 Implementing Regulations at 36 CFR § 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's APE in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Two archaeological surveys were completed to investigate the APE for the *2010 Final SRIPP PEIS*. In 2009, an investigation of the proposed groin, breakwater, and shoreline that would be impacted by the SRIPP project was completed. This investigation included pedestrian survey of the Wallops Island shoreline, archaeological monitoring of the installation of geotextile tubes along the shoreline, a diving survey of the proposed groin location, and a remote sensing survey of the proposed breakwater area. The investigation did not identify any archaeological resources in the areas and no additional work was recommended (Randolph *et al*. 2009). The second investigation for the *2010 Final SRIPP PEIS* was conducted in 2010. This survey investigated the proposed offshore sand borrow areas using underwater remote sensing. No underwater archaeological resources were identified during the survey and no additional work was recommended for the borrow area (Randolph *et al.* 2010).

No previously identified archaeological sites are located in the APE for the project. Three previously identified archaeological sites are located on Wallops Island in the vicinity of the APE. The Military Earthworks site (44AC0089) is a Revolutionary War gun emplacement located at the northern end of Wallops Island. The site was subjected to additional investigations and recommended eligible for listing in the NRHP. Site 44AC0159 is an unnamed site located at the southern end of Wallops Island. The site is described as a shell pile or shell midden and has been determined not eligible for listing in the NRHP. Site 44AC0459 is a trash scatter associated with the Coast Guard Life Saving Station and Observation Tower. This site was also determined not eligible for the NRHP (NASA 2022a).

In accordance with Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments*; EO 12372, *Intergovernmental Review of Federal Programs*; and Section 106 of the National Historic Preservation Act and its implementation regulations found at 36 CFR § 800.2, § 800.3, and § 800.4, NASA respectfully requests your assistance in identifying the following:

- traditional resources or sacred sites that may be located within the current APE;
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- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight

Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the appropriate protocol for inadvertent discoveries.

Conclusion

Pursuant to 36 CFR Section 800.4(d)(1), NASA has reached a preliminary determination of no historic properties affected for the proposed undertaking with respect to historic properties in the APE. However, prior to finalizing our effects determination, we would like to solicit input regarding Tribal resources that may be present within the APE.

If you request additional consultation, NASA will work with your office to adopt procedures that will meet your Tribe's needs and requirements for continued consultation.

In order to address your concerns in a timely manner for both the Tribe and the proposed undertaking, please respond to this letter within thirty (30) days of receipt to Irene Romero at irene.j.romero@nasa.gov. Thank you for your assistance.

Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

1- Map depicting the location of Wallops Flight Facility, Wallops Island, Virginia
2- Map showing the Area of Potential Effects
3- References Cited

National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Chief Gerald Stewart
Chickahominy Indians, Eastern Division
2895 Mt Pleasant Road
Providence Forge, VA 23140

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Chief Stewart,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

NASA has determined that the proposed project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and it is a type of activity that has the potential to cause effects on historic properties. NASA has prepared an Environmental Assessment to evaluate the potential environmental effects of both enhancing and protecting the shoreline on Wallops Island with the proposed Federal action alternatives. The Shoreline Protection Program (SPP) Tiered EA has been prepared by NASA in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code

[U.S.C.] 4321-4347); NASA procedures for implementing NEPA (14 CFR 1216.3); and NASA Procedural Requirement (NPR) *Implementing the National Environmental Policy Act and Executive Order 12114* (NPR 8580.1). The U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) and U.S. Army Corps of Engineers (USACE), Norfolk District are Cooperating Agencies with NASA serving as the lead agency.

The purpose of this letter is to initiate consultation pursuant to the terms of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800. This letter serves to define the Area of Potential Effects (APE) for the undertaking and gauge project effects located within the bounds of the proposed undertaking.

Description of Undertaking

Consistent with the Action Alternatives described in detail in the 2010 Final SRIPP PEIS (NASA 2010), reexamined in the 2013 Final Post-Hurricane Sandy EA (NASA 2013), and implemented following completion of the 2019 Final Shoreline Enhancement and Restoration Project EA (NASA 2019), NASA's proposed undertaking would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The undertaking could involve a combination of sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station; breakwater construction nearshore between existing sets of breakwaters; as well as repairs and extension of the existing seawall. Shoreline stabilization activities could occur in phases depending on a number of factors including: infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction or both could occur in another area. Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post- dredging surveys) under the proposed undertaking would be consistent with those described in detail in previous NEPA (NASA 2010; NASA 2013; NASA 2019). For this proposed undertaking, sand material for beach renourishment would come from Outer Continental Shelf (OCS) Unnamed Shoal A. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019).

No Action Alternative

Under the No Action Alternative, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and sea level rise; or repair or extend the existing seawall.

Area of Potential Effects (36 CFR § 800.4(a)(1))

An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this undertaking, NASA determined that the APE

includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

Pursuant to the NHPA, Section 106 Implementing Regulations at 36 CFR § 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's APE in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Two archaeological surveys were completed to investigate the APE for the *2010 Final SRIPP PEIS*. In 2009, an investigation of the proposed groin, breakwater, and shoreline that would be impacted by the SRIPP project was completed. This investigation included pedestrian survey of the Wallops Island shoreline, archaeological monitoring of the installation of geotextile tubes along the shoreline, a diving survey of the proposed groin location, and a remote sensing survey of the proposed breakwater area. The investigation did not identify any archaeological resources in the areas and no additional work was recommended (Randolph *et al*. 2009). The second investigation for the *2010 Final SRIPP PEIS* was conducted in 2010. This survey investigated the proposed offshore sand borrow areas using underwater remote sensing. No underwater archaeological resources were identified during the survey and no additional work was recommended for the borrow area (Randolph *et al.* 2010).

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In accordance with Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments*; EO 12372, *Intergovernmental Review of Federal Programs*; and Section 106 of the National Historic Preservation Act and its implementation regulations found at 36 CFR § 800.2, § 800.3, and § 800.4, NASA respectfully requests your assistance in identifying the following:

- traditional resources or sacred sites that may be located within the current APE;
- historic properties in the APE of which we may not be aware; and/or
- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the appropriate protocol for inadvertent discoveries.

Conclusion

Pursuant to 36 CFR Section 800.4(d)(1), NASA has reached a preliminary determination of no historic properties affected for the proposed undertaking with respect to historic properties in the APE. However, prior to finalizing our effects determination, we would like to solicit input regarding Tribal resources that may be present within the APE.

If you request additional consultation, NASA will work with your office to adopt procedures that will meet your Tribe's needs and requirements for continued consultation.

In order to address your concerns in a timely manner for both the Tribe and the proposed undertaking, please respond to this letter within thirty (30) days of receipt to Irene Romero at irene.j.romero@nasa.gov. Thank you for your assistance.

Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

1- Map depicting the location of Wallops Flight Facility, Wallops Island, Virginia
2- Map showing the Area of Potential Effects
3- References Cited

National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Stephen Adkins
Chief
Chickahominy Indian Tribe
8200 Lott Cary Road
Providence Forge, VA 23140

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Chief Adkins,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

NASA has determined that the proposed project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and it is a type of activity that has the potential to cause effects on historic properties. NASA has prepared an Environmental Assessment to evaluate the potential environmental effects of both enhancing and protecting the shoreline on Wallops Island with the proposed Federal action alternatives. The Shoreline Protection Program (SPP) Tiered EA has been prepared by NASA in accordance with the requirements of the

National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code [U.S.C.] 4321-4347); NASA procedures for implementing NEPA (14 CFR 1216.3); and NASA Procedural Requirement (NPR) *Implementing the National Environmental Policy Act and Executive Order 12114* (NPR 8580.1). The U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) and U.S. Army Corps of Engineers (USACE), Norfolk District are Cooperating Agencies with NASA serving as the lead agency.

The purpose of this letter is to initiate consultation pursuant to the terms of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800. This letter serves to define the Area of Potential Effects (APE) for the undertaking and gauge project effects located within the bounds of the proposed undertaking.

Description of Undertaking

Consistent with the Action Alternatives described in detail in the 2010 Final SRIPP PEIS (NASA 2010), reexamined in the 2013 Final Post-Hurricane Sandy EA (NASA 2013), and implemented following completion of the 2019 Final Shoreline Enhancement and Restoration Project EA (NASA 2019), NASA's proposed undertaking would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The undertaking could involve a combination of sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station; breakwater construction nearshore between existing sets of breakwaters; as well as repairs and extension of the existing seawall. Shoreline stabilization activities could occur in phases depending on a number of factors including: infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction or both could occur in another area. Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post- dredging surveys) under the proposed undertaking would be consistent with those described in detail in previous NEPA (NASA 2010; NASA 2013; NASA 2019). For this proposed undertaking, sand material for beach renourishment would come from Outer Continental Shelf (OCS) Unnamed Shoal A. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019).

No Action Alternative

Under the No Action Alternative, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and sea level rise; or repair or extend the existing seawall.

Area of Potential Effects (36 CFR § 800.4(a)(1))

An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various

kinds of effects caused by the undertaking. For this undertaking, NASA determined that the APE includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

Pursuant to the NHPA, Section 106 Implementing Regulations at 36 CFR § 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's APE in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Two archaeological surveys were completed to investigate the APE for the *2010 Final SRIPP PEIS*. In 2009, an investigation of the proposed groin, breakwater, and shoreline that would be impacted by the SRIPP project was completed. This investigation included pedestrian survey of the Wallops Island shoreline, archaeological monitoring of the installation of geotextile tubes along the shoreline, a diving survey of the proposed groin location, and a remote sensing survey of the proposed breakwater area. The investigation did not identify any archaeological resources in the areas and no additional work was recommended (Randolph *et al*. 2009). The second investigation for the *2010 Final SRIPP PEIS* was conducted in 2010. This survey investigated the proposed offshore sand borrow areas using underwater remote sensing. No underwater archaeological resources were identified during the survey and no additional work was recommended for the borrow area (Randolph *et al.* 2010).

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In accordance with Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments*; EO 12372, *Intergovernmental Review of Federal Programs*; and Section 106 of the National Historic Preservation Act and its implementation regulations found at 36 CFR § 800.2, § 800.3, and § 800.4, NASA respectfully requests your assistance in identifying the following:

- traditional resources or sacred sites that may be located within the current APE;
- historic properties in the APE of which we may not be aware; and/or
- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight

Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the appropriate protocol for inadvertent discoveries.

Conclusion

Pursuant to 36 CFR Section 800.4(d)(1), NASA has reached a preliminary determination of no historic properties affected for the proposed undertaking with respect to historic properties in the APE. However, prior to finalizing our effects determination, we would like to solicit input regarding Tribal resources that may be present within the APE.

If you request additional consultation, NASA will work with your office to adopt procedures that will meet your Tribe's needs and requirements for continued consultation.

In order to address your concerns in a timely manner for both the Tribe and the proposed undertaking, please respond to this letter within thirty (30) days of receipt to Irene Romero at irene.j.romero@nasa.gov. Thank you for your assistance.

Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

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National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Tribal Chief Lee Lockamy
Nansemond Indian Tribe
1001 Pembroke Lane
Suffolk, VA 23434

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Chief Lockamy,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

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Identification of Historic Properties (36 CFR § 800.4(b))

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- traditional resources or sacred sites that may be located within the current APE;
- historic properties in the APE of which we may not be aware; and/or
- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the appropriate protocol for inadvertent discoveries.

Conclusion

Pursuant to 36 CFR Section 800.4(d)(1), NASA has reached a preliminary determination of no historic properties affected for the proposed undertaking with respect to historic properties in the APE. However, prior to finalizing our effects determination, we would like to solicit input regarding Tribal resources that may be present within the APE.

If you request additional consultation, NASA will work with your office to adopt procedures that will meet your Tribe's needs and requirements for continued consultation.

In order to address your concerns in a timely manner for both the Tribe and the proposed undertaking, please respond to this letter within thirty (30) days of receipt to Irene Romero at irene.j.romero@nasa.gov. Thank you for your assistance.

Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

1- Map depicting the location of Wallops Flight Facility, Wallops Island, Virginia
2- Map showing the Area of Potential Effects
3- References Cited

National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Chief Robert Gray
Pamunkey Indian Nation
1054 Pocahontas Trail
King William, VA 23086

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Chief Gray,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

NASA has determined that the proposed project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and it is a type of activity that has the potential to cause effects on historic properties. NASA has prepared an Environmental Assessment to evaluate the potential environmental effects of both enhancing and protecting the shoreline on Wallops Island with the proposed Federal action alternatives. The Shoreline Protection Program (SPP) Tiered EA has been prepared by NASA in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code

[U.S.C.] 4321-4347); NASA procedures for implementing NEPA (14 CFR 1216.3); and NASA Procedural Requirement (NPR) *Implementing the National Environmental Policy Act and Executive Order 12114* (NPR 8580.1). The U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) and U.S. Army Corps of Engineers (USACE), Norfolk District are Cooperating Agencies with NASA serving as the lead agency.

The purpose of this letter is to initiate consultation pursuant to the terms of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800. This letter serves to define the Area of Potential Effects (APE) for the undertaking and gauge project effects located within the bounds of the proposed undertaking.

Description of Undertaking

Consistent with the Action Alternatives described in detail in the 2010 Final SRIPP PEIS (NASA 2010), reexamined in the 2013 Final Post-Hurricane Sandy EA (NASA 2013), and implemented following completion of the 2019 Final Shoreline Enhancement and Restoration Project EA (NASA 2019), NASA's proposed undertaking would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The undertaking could involve a combination of sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station; breakwater construction nearshore between existing sets of breakwaters; as well as repairs and extension of the existing seawall. Shoreline stabilization activities could occur in phases depending on a number of factors including: infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction or both could occur in another area. Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post- dredging surveys) under the proposed undertaking would be consistent with those described in detail in previous NEPA (NASA 2010; NASA 2013; NASA 2019). For this proposed undertaking, sand material for beach renourishment would come from Outer Continental Shelf (OCS) Unnamed Shoal A. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019).

No Action Alternative

Under the No Action Alternative, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and sea level rise; or repair or extend the existing seawall.

Area of Potential Effects (36 CFR § 800.4(a)(1))

An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this undertaking, NASA determined that the APE

includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

Pursuant to the NHPA, Section 106 Implementing Regulations at 36 CFR § 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's APE in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Two archaeological surveys were completed to investigate the APE for the *2010 Final SRIPP PEIS*. In 2009, an investigation of the proposed groin, breakwater, and shoreline that would be impacted by the SRIPP project was completed. This investigation included pedestrian survey of the Wallops Island shoreline, archaeological monitoring of the installation of geotextile tubes along the shoreline, a diving survey of the proposed groin location, and a remote sensing survey of the proposed breakwater area. The investigation did not identify any archaeological resources in the areas and no additional work was recommended (Randolph *et al*. 2009). The second investigation for the *2010 Final SRIPP PEIS* was conducted in 2010. This survey investigated the proposed offshore sand borrow areas using underwater remote sensing. No underwater archaeological resources were identified during the survey and no additional work was recommended for the borrow area (Randolph *et al.* 2010).

No previously identified archaeological sites are located in the APE for the project. Three previously identified archaeological sites are located on Wallops Island in the vicinity of the APE. The Military Earthworks site (44AC0089) is a Revolutionary War gun emplacement located at the northern end of Wallops Island. The site was subjected to additional investigations and recommended eligible for listing in the NRHP. Site 44AC0159 is an unnamed site located at the southern end of Wallops Island. The site is described as a shell pile or shell midden and has been determined not eligible for listing in the NRHP. Site 44AC0459 is a trash scatter associated with the Coast Guard Life Saving Station and Observation Tower. This site was also determined not eligible for the NRHP (NASA 2022a).

In accordance with Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments*; EO 12372, *Intergovernmental Review of Federal Programs*; and Section 106 of the National Historic Preservation Act and its implementation regulations found at 36 CFR § 800.2, § 800.3, and § 800.4, NASA respectfully requests your assistance in identifying the following:

- traditional resources or sacred sites that may be located within the current APE;
- historic properties in the APE of which we may not be aware; and/or
- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the appropriate protocol for inadvertent discoveries.

Conclusion

Pursuant to 36 CFR Section 800.4(d)(1), NASA has reached a preliminary determination of no historic properties affected for the proposed undertaking with respect to historic properties in the APE. However, prior to finalizing our effects determination, we would like to solicit input regarding Tribal resources that may be present within the APE.

If you request additional consultation, NASA will work with your office to adopt procedures that will meet your Tribe's needs and requirements for continued consultation.

In order to address your concerns in a timely manner for both the Tribe and the proposed undertaking, please respond to this letter within thirty (30) days of receipt to Irene Romero at irene.j.romero@nasa.gov. Thank you for your assistance.

Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

1- Map depicting the location of Wallops Flight Facility, Wallops Island, Virginia
2- Map showing the Area of Potential Effects
3- References Cited

National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Paramount Chief Norris Howard, Sr.
Pocomoke Indian Nation
3355 Allen Road
Eden, MD 21822

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Paramount Chief Howard,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

NASA has determined that the proposed project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and it is a type of activity that has the potential to cause effects on historic properties. NASA has prepared an Environmental Assessment to evaluate the potential environmental effects of both enhancing and protecting the shoreline on Wallops Island with the proposed Federal action alternatives. The Shoreline Protection Program (SPP) Tiered EA has been prepared by NASA in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code

[U.S.C.] 4321-4347); NASA procedures for implementing NEPA (14 CFR 1216.3); and NASA Procedural Requirement (NPR) *Implementing the National Environmental Policy Act and Executive Order 12114* (NPR 8580.1). The U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) and U.S. Army Corps of Engineers (USACE), Norfolk District are Cooperating Agencies with NASA serving as the lead agency.

The purpose of this letter is to initiate consultation pursuant to the terms of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800. This letter serves to define the Area of Potential Effects (APE) for the undertaking and gauge project effects located within the bounds of the proposed undertaking.

Description of Undertaking

Consistent with the Action Alternatives described in detail in the 2010 Final SRIPP PEIS (NASA 2010), reexamined in the 2013 Final Post-Hurricane Sandy EA (NASA 2013), and implemented following completion of the 2019 Final Shoreline Enhancement and Restoration Project EA (NASA 2019), NASA's proposed undertaking would implement measures to protect the beach along the Wallops Island shoreline infrastructure protection area. The undertaking could involve a combination of sand renourishment within an approximate 15,000-foot section of shoreline from the south property line on Wallops Island north to the location of the fire station; breakwater construction nearshore between existing sets of breakwaters; as well as repairs and extension of the existing seawall. Shoreline stabilization activities could occur in phases depending on a number of factors including: infrastructure prioritized for protection, the pace and location of erosion, and the availability of funding. For example, a section of beach that experiences rapid erosion in a storm event could be renourished followed by construction of breakwaters in one year, and in another year additional renourishment, breakwaters construction or both could occur in another area. Renourishment processes (i.e., beach fill mobilization, dredging and sand placement, and pre- and post- dredging surveys) under the proposed undertaking would be consistent with those described in detail in previous NEPA (NASA 2010; NASA 2013; NASA 2019). For this proposed undertaking, sand material for beach renourishment would come from Outer Continental Shelf (OCS) Unnamed Shoal A. All dredging and equipment placement would take place in areas previously surveyed (NASA 2010, 2013, 2019).

No Action Alternative

Under the No Action Alternative, NASA would not renourish the Wallops Island shoreline infrastructure protection area beach and dune system; provide additional breakwaters to reduce the potential for damage to, or loss of, NASA, Navy, Air Force, and VSA MARS assets on Wallops Island from storm events and sea level rise; or repair or extend the existing seawall.

Area of Potential Effects (36 CFR § 800.4(a)(1))

An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this undertaking, NASA determined that the APE

includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

Pursuant to the NHPA, Section 106 Implementing Regulations at 36 CFR § 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's APE in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Two archaeological surveys were completed to investigate the APE for the *2010 Final SRIPP PEIS*. In 2009, an investigation of the proposed groin, breakwater, and shoreline that would be impacted by the SRIPP project was completed. This investigation included pedestrian survey of the Wallops Island shoreline, archaeological monitoring of the installation of geotextile tubes along the shoreline, a diving survey of the proposed groin location, and a remote sensing survey of the proposed breakwater area. The investigation did not identify any archaeological resources in the areas and no additional work was recommended (Randolph *et al*. 2009). The second investigation for the *2010 Final SRIPP PEIS* was conducted in 2010. This survey investigated the proposed offshore sand borrow areas using underwater remote sensing. No underwater archaeological resources were identified during the survey and no additional work was recommended for the borrow area (Randolph *et al.* 2010).

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- traditional resources or sacred sites that may be located within the current APE;
- historic properties in the APE of which we may not be aware; and/or
- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

There are no known historic properties within the APE at Wallops Island. In the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the work would immediately stop, and the Wallops Flight Facility Cultural Resources Manager would be notified. The Wallops Flight Facility Cultural Resources Manager would follow the appropriate protocol for inadvertent discoveries.

Conclusion

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Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

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2- Map showing the Area of Potential Effects
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National Aeronautics and
Space Administration

NASA Goddard Space Flight Center
Greenbelt, MD 20771

January 20, 2026

Chief Anne Richardson
Rappahannock Tribe of Virginia
5036 Indian Neck Road
Stephens Church, VA 23148

SUBJECT: National Historic Preservation Act Section 106 Consultation for the National Aeronautics and Space Administration Shoreline Protection Program at Goddard Space Flight Center's Wallops Flight Facility Wallops Island, Virginia

Dear Chief Richardson,

The National Aeronautics and Space Administration (NASA) proposes to implement measures to protect the beach along the Wallops Island shoreline at Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Virginia (Enclosure 1). The purpose is to protect the Wallops Island shoreline through beach renourishment, construction of additional breakwaters, and/or repair and extend existing seawall in order to reduce the potential for damage to, or loss of, NASA, United States (U.S.) Navy (Navy), U.S. Air Force (Air Force), and Virginia Spaceport Authority (VSA) Mid-Atlantic Regional Spaceport (MARS) assets on Wallops Island from effects associated with storm events and sea level rise. The beach berm and dune system that was established to protect NASA's Wallops Island launch range infrastructure in 2012 has been subject to erosion through storm wind and wave damage. The originally designed and constructed beach system served its intended purpose of reducing damage to the range assets; however, a notable portion of sub-aerial (i.e., on land surface) sand is often relocated by storm winds and waves with a majority of this sand volume transported to the north end of Wallops Island. The effects of storms are most apparent within the southern half of the Wallops Island beach, where the majority of the highly critical launch assets are located. Within this area, the seaward half of the beach berm and dune system must be maintained to the level of functionality it was originally intended through periodic beach renourishment and shoreline protection.

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No Action Alternative

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includes the sand dredging from Unnamed Shoal A, pumpout buoy area, beach renourishment area, and construction of offshore breakwaters (Enclosure 2).

Identification of Historic Properties (36 CFR § 800.4(b))

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- traditional resources or sacred sites that may be located within the current APE;
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- your Tribe's interest in participating in additional consultation.

Results of Identification and Evaluation (36 CFR § 800.4(d))

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Conclusion

Pursuant to 36 CFR Section 800.4(d)(1), NASA has reached a preliminary determination of no historic properties affected for the proposed undertaking with respect to historic properties in the APE. However, prior to finalizing our effects determination, we would like to solicit input regarding Tribal resources that may be present within the APE.

If you request additional consultation, NASA will work with your office to adopt procedures that will meet your Tribe's needs and requirements for continued consultation.

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Sincerely,

Irene J. Romero

Irene Romero
NASA Goddard Cultural Resources Manager
8800 Greenbelt Road
Greenbelt, MD 20771

Enclosures:

1- Map depicting the location of Wallops Flight Facility, Wallops Island, Virginia
2- Map showing the Area of Potential Effects
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