FINDING OF NO SIGNIFICANT IMPACT

Issuance of a Negotiated Agreement for Use of Outer Continental Shelf Sand from Unnamed Shoal in the Wallops Island, Virginia Post-Hurricane Sandy Shoreline Repair

Pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations implementing NEPA (40 CFR 1500-1508) and Department of the Interior (DOI) regulations implementing NEPA (43 CFR 46), the National Aeronautics and Space Administration (NASA) Wallops Flight Facility, in coordination with the Bureau of Ocean Energy Management (BOEM), prepared an environmental assessment (EA) to determine whether authorizing the use of Outer Continental Shelf (OCS) sand from Unnamed Shoal A in the Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (SRIPP) would have a significant effect on the human environment and whether an environmental impact statement (EIS) should be prepared. The EA tiers from the Final Programmatic Environmental Impact Statement (PEIS) prepared by the National Aeronautics and Space Administration (NASA).

BOEM's proposed action is the issuance of a negotiated agreement, and its purpose is to authorize use of an OCS borrow area, Unnamed Shoal A (sub-areas A-1 and A-2), so that NASA can obtain the necessary sand resources to undertake the beach nourishment project. The project is needed to address shoreline erosion and protect valuable property along the Wallops Island Flight Facility shoreline. This renourishment effort is presently being constructed using funding provided through Disaster Relief Appropriations Act of 2013 to address impacts from Hurricane Sandy.

Pursuant to NEPA, NASA described the affected environment, evaluated potential environmental impacts resulting from the proposed action, and developed and described alternatives to the proposed action in its *Final Programmatic Environmental Impact Statement Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (Final PEIS)*. (NASA 2010; http://sites.wff.nasa.gov/code250/final_sripp_peis_document.html). In March 2011, BOEM, as a cooperating agency, adopted the Final PEIS and issued a Record of Decision authorizing use of OCS sand in the initial construction of the Wallops Flight Facility SRIPP. This EA incorporates by reference the effects analyses in these previous environmental documents that have been determined to still be valid and augments a subset of analyses in light of new information.

NASA and BOEM identified and reviewed new information to determine if any resources should be re-evaluated, or if the new information would result in significantly different effects. New information was identified that further supports or elaborates on the analyses or information presented in existing NEPA documents, but it did not change the conclusions of any of those analyses. Based on the analyses in the EA, no new significant impacts were identified that were not already adequately addressed, nor was it necessary to change the conclusions of the types, levels, or locations of impacts described in those documents

Alternatives to the Proposed Action

The 2010 EIS considered in detail a range of potential shore protection alternatives, including the extension of the seawall combined with beach fill and the extension of the seawall combined with beach fill and sand retention structure (either groin or breakwater). These alternatives were evaluated in more detail and their components (i.e., location of sand retention structure, length and width of beach fill, renourishment frequency) were combined into 54 different potential alternatives. Based upon a combination of economic, engineering, and environmental factors, NASA selected beach nourishment combined with a seawall extension as the alternative that would best meet its needs for the Wallops Flight Facility SRIPP. The project was initially constructed in 2012. NASA's most recent monitoring effort, conducted in November 2012 following Hurricane Sandy (which made landfall in late October 2012), identified the need to repair the southern two-thirds of the recently nourished beach and a section of the seawall. Subsequent to NASA identifying this need, Public Law 113-2, Disaster Relief Appropriations Act, 2013, was signed into law on January 29, 2013. There is a provision within the bill for NASA to repair its facilities that sustained damages during Hurricane Sandy. Accordingly, NASA (with BOEM as a cooperating agency) has prepared this EA to consider this maintenance cycle in order to return the Wallops shoreline to the condition described in the 2010 EIS preferred alternative.

As an alternative to the proposed action, BOEM considered not authorizing use of the Unnamed Shoal A (sub-areas A-1 and A-2) borrow area. The project proponents could either (a) re-evaluate the project to choose another alternative method or sand source to restore the Wallops Flight Facility SRIPP, or (b) locate an onshore source of comparable high-quality sand. Option A may be viable if another sand source, such as Unnamed Shoal B, is considered. The borrow area at Unnamed Shoal B is approximately 5 miles further from the placement site than Unnamed Shoal A. The extra transportation distance would lead to increased impacts to air quality, increased potential for ship strike of endangered species and marine mammals and an additional financial burden. Option B is not considered to be viable as sources of approved onshore sand are limited. Even if a sufficient amount of high-quality sand is located onshore, Option B is likely to result in increased environmental disruption/effect from the onshore excavation of and overland transport. Alternatively, NASA could not undertake the project at this time. In the case of the no project option, coastal erosion would continue, sea turtle and shorebird nesting habitat would deteriorate, and there is the potential for damage to critical NASA infrastructure including some of NASA and the Commonwealth of Virginia's most critical launch assets, including Launch Complex 0 and multiple sounding rocket pads.

Environmental Effects

The EA evaluates potential environmental effects resulting from the issuance of a negotiated agreement. The connected actions of conveyance and placement of the sand are considered. The EA and FONSI identify all mitigation, monitoring, and reporting requirements necessary to avoid, minimize, and/or reduce and track any foreseeable adverse impacts that may result from all phases of construction. A subset of mitigation, monitoring, and reporting requirements, specific to activities under BOEM jurisdiction, will be incorporated into the negotiated agreement to avoid, minimize, and/or reduce and track any foreseeable adverse impacts (Attachment 1).

Significance Review

Pursuant to 40 CFR 1508.27, BOEM evaluated the significance of potential environmental effects considering both CEQ context and intensity factors. The potential significance of environmental effects has been analyzed in both spatial and temporal context. Potential effects are generally considered reversible because they will be minor to moderate, localized, and short-lived. The ten intensity factors were considered in the EA and are specifically addressed below:

1. Impacts that may be both beneficial and adverse.

Potential adverse effects to the physical environment, biological resources, cultural resources, and socioeconomic resources have been considered. Adverse effects to benthic habitat and communities in the borrow area are expected to be reversible. Short-term and local effects on fish habitat and fishes are expected within the dredged area due to reduction of benthic habitat and prey, as well as changes in shoal morphology and burial of existing benthic habitat in the fill area. Dredging operations will be performed to avoid the creation of deep pits in the borrow area. Potential effects to sea turtles, marine mammals, and Atlantic sturgeon in the vicinity of operations have been reduced through tested mitigation, such as sea turtle deflector use, sea turtle monitoring and protected species observers. Temporary displacement of or behavior modification of birds near the borrow areas or beach placement could occur. Overall, impacts would be short-term, localized and temporary and should have no lasting effects on bird populations in the area. Temporary reduction of water quality is expected due to turbidity during dredging and placement operations. Best management practices for erosion and turbidity controls will be used pursuant to the requirements of the Virginia Water Protection Permit. Small, localized, temporary increases in concentrations of air pollutant emissions are expected, but the short-term impact by emissions from the dredge or the tugs would not affect the overall air quality of the area. A temporary increase in noise level and a temporary reduction in the aesthetic value offshore during construction in the vicinity of the dredging would occur. For safety reasons, navigational and recreational resources located in the vicinity of the dredging operation would temporarily be unavailable for use. There would also be beneficial impacts from increased storm protection for valuable infrastructure and newly created shorebird and sea turtle nesting habitat.

2. The degree to which the proposed action affects public health or safety.

The proposed activities are not expected to significantly affect public health. Construction noise will temporarily increase ambient noise levels and equipment emissions would decrease air quality in the immediate vicinity of placement activities. Dredging operations will be performed in accordance with an environmental protection plan, addressing marine pollution, waste disposal, and air pollution. The public is typically prevented from entering the segment of beach under construction, so recreational activities will not be occurring in close proximity to operations.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

No prime or unique farmland, park lands, designated Wild and Scenic reaches, or wetlands would be impacted by implementation of this project. No critical habitat for the listed species is located within the project area. Unnamed Shoal A has been designated as Essential Fish Habitat

(EFH) for 26 federally managed species. Dredging may affect feeding success of EFH species due to turbidity, habitat perturbation, and loss of benthic prey. Impacts to EFH would occur on Unnamed Shoal A, but the limited spatial and temporal extent of dredging will not adversely affect EFH on a broad scale. NASA has agreed to implement, pursuant to 305(b)(4)(A) of the MSA, the National Marine Fisheries Service (NMFS) EFH conservation recommendations. Cultural resources are described in more detail below.

4. *The degree to which the effects on the quality of the human environment are likely to be highly controversial.*

No effects are expected that are scientifically controversial. Effects from beach nourishment projects, including dredging on the OCS, are generally well studied. The effects analyses in the EA has relied on the best available scientific information, including information collected from previous dredging and nourishment activities in and adjacent to the project area. Numerous studies and/or monitoring efforts have been undertaken in the vicinity of Unnamed Shoal A evaluating the effects of dredging and beach nourishment on shoreline change, habitat condition, benthic communities, and fish.

5. *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*

Beach nourishment is a common solution to coastal erosion problems along the mid-Atlantic coast. Beach nourishment along the Wallops Flight Facility SRIPP previously occurred in 2012. The project design is typical of beach nourishment operations. Mitigation and monitoring efforts are similar to that undertaken for past projects and have been demonstrated to be effective. The effects of the proposed action are not expected to be highly uncertain, and the proposed activities do not involve any unique or unknown risks. No significant adverse effects were documented during or as a result of the past operation. The potential impacts on sea turtles, Atlantic sturgeon North Atlantic right whales, blue whales, sperm whales, and fin whales were previously coordinated with the National Marine Fisheries Service (NMFS). On March 21, 2013, NMFS notified NASA that the scope of the Proposed Action would be within that already considered in its August 3, 2012 biological opinion (BO) and that the new information did not warrant re-initiation of formal Endangered Species Act (ESA) consultation (see EA Appendix A). On March 20, 2013, US Fish and Wildlife Service (USFWS) notified NASA that the scope of the Proposed Action would be within that already considered in its July 30, 2010 programmatic BO (see EA Appendix A). In developing the BOs, NMFS and USFWS provided mandatory terms and conditions that NASA must follow to reduce potential effects to listed species. NASA and USACE (partnering with NASA to complete the construction) will ensure that their contractors implement these measures on their behalf. Mitigation and monitoring efforts are similar to that undertaken for past projects and have been demonstrated to be effective. The effects of the proposed action are not expected to be highly uncertain, and the proposed activities do not involve any unique or unknown risks.

6. *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

No precedent for future action or decision in principle for future consideration is being made in BOEM's decision to authorize re-use of the Unnamed Shoal A for this construction cycle. BOEM considers each use of a borrow area on the OCS as a new federal action. The Bureau's

authorization of the use of the borrow area does not dictate the outcome of future leasing decisions. Future actions will also be subject to the requirements of NEPA and other applicable environmental laws.

7. *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.*

Significance may exist if it is reasonable to anticipate cumulatively significant impacts that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. The EA identifies those actions and potential impacts related to underlying activities. The EA concludes that the activities related to the proposed action are not reasonably anticipated to incrementally add to the effects of other activities to the extent of producing significant effects. Because the seafloor is expected to equilibrate, sand moving alongshore and will slowly accumulate offshore, the proposed project provides an incremental, but localized effect on the reduction of offshore sand resources. Although there will be a short-term and local decline in benthic habitat and populations, both are expected to recover within a few years. No significant cumulative impacts to benthic or fish habitat and associated communities are expected from the continued use of the borrow area, although NMFS Habitat Conservation Division has expressed some concern over the repetitive use if dredging will re-occur at intervals more frequent than the expected time recovery of benthic communities.

8. *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.*

The proposed action is not expected to adversely affect historic resources. Seafloor-disturbing activities (e.g., dredging, anchoring, pipeline emplacement and relocation) may occur during proposed construction activities. NASA conducted remote sensing surveys of Unnamed Shoal A in 2009 in order to meet compliance with the National Historic Preservation Act (NHPA) and the Abandoned Shipwreck Act. No significant submerged cultural resources were identified at either shoal studied. NASA coordinated with the Virginia Department of Historic Resources (DHR). BOEM will work with DHR should shipwreck remains be unexpectedly discovered (30 CFR 250.194 and 30 CFR 250.1010). NASA also coordinated with the Catawba Indian Nation the Lenape Indian Tribe of Delaware, and the Pocomoke Indian Nation. No significant impacts to cultural resources in the project area (borrow, placement or pump-out areas), as result of the proposed action, are anticipated with implementation of the measures to cease work if an unexpected discovery occurs, and immediate notification to DHR so they can determine if the resource is significant or not and make the determination of the best means to protect the resource. All of these activities have been completed in accordance with the NHPA) as amended; the Archeological and Historic Preservation Act (AHPA), as amended; and Executive Order 11593.

9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*

Nesting and swimming sea turtles, Atlantic sturgeon, piping plovers, and red knot may be present in the project area during and after construction operations and may be adversely affected if present. However, no take of any of these species has been documented during past construction cycles. NASA will comply with all requirements of biological opinions and

concurrences associated with this project provided under the ESA from both USFWS and NMFS to minimize effects. USFWS and NMFS have determined that the proposed action will not jeopardize these species' continued existence.

If a hopper dredge is used for dredging operations, potential impacts to sea turtles could occur. To minimize the risk to sea turtles, standard sea turtle protection conditions will be implemented such as the use of a state-of-the-art rigid deflector draghead, screening and/or observers, and/or novel monitoring techniques. The full scope of monitoring will depend on the dredge plant and screening being used. The full scope of mitigation measures is detailed in NMFS' biological opinion. Monitoring for nesting sea turtles will also occur during beach construction operations. Construction operations will be modified and protective measures implemented if sea turtle nests or crawls are observed.

The potential exists for plover and red knot nesting activity to occur within the proposed project site, and accordingly, NASA would employ a biological monitor to survey the project site on a daily basis should work occur between the months of April and September.

Humpback whales, Fin whales, and North Atlantic right whales occur only rarely in the project area, and therefore, the likelihood of adverse impacts are very low and the chances of the proposed action affecting them are discountable. Seabeach amaranth is not expected to be in the project area.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

NASA and the USACE must comply with all applicable Federal, State, and local laws and requirements. The dredging contractor is required to provide an environmental protection plan that verifies this compliance. NASA has undertaken the necessary consultations with NMFS, USFWS, and other state agencies. The Virginia Department of Environmental Quality (VDEQ) concurred with the consistency determination prepared by NASA (EA Appendix A). NASA also consulted with VDEQ regarding the applicability of its previous water protection permit waiver to the Proposed Action. VDEQ confirmed that the previous waiver would apply to the project. A Virginia Marine Resources Commission Permit and modification was obtained by NASA. The proposed action is in compliance with the Marine Mammal Protection Act. Marine mammals are not likely to be adversely affected by the project and incorporation of safeguards to protect threatened and endangered species during project construction would also protect marine mammals.

Consultations and Public Involvement

NASA, serving as the lead Federal agency, and BOEM, in a consulting role, has coordinated with the USACE, USFWS, NMFS, VDEQ, VMRC and the Virginia DHR in support of this leasing decision. Pertinent correspondence with Federal and state agencies are provided in Appendix A of the EA. After signature of this Finding of No Significant Impact (FONSI), a Notice of Availability of the FONSI and EA will be prepared and published by BOEM in the Federal Register or by other appropriate means. The EA and FONSI will be posted to BOEM web site [http://www.boem.gov/Non-Energy-Minerals/Marine-Minerals-Program.aspx].

Conclusion

BOEM has considered the consequences of issuing a negotiated agreement to authorize use of OCS sand from Unnamed Shoal A in the Wallops Flight Facility SRIPP. BOEM independently reviewed the attached EA (Attachment 2) and finds that it complies with the relevant provisions of the CEQ regulations implementing NEPA, DOI regulations implementing NEPA, and other Marine Mineral Program requirements. Based on the NEPA and consultation process, appropriate terms and conditions enforceable by BOEM will be incorporated into the negotiated agreement to avoid, minimize, and/or mitigate any foreseeable adverse impacts.

Based on the evaluation of potential impacts and mitigating measures discussed in the EA, BOEM finds that entering into a negotiated agreement, with the implementation of the mitigating measures, does not constitute a major Federal action significantly affecting the quality of the human environment, in the sense of NEPA Section 102(2)(C), and will not require preparation of an EIS.

James F. Bennett
Chief, Division of Environmental Assessment

July 5, 2013
Date

Attachment 1

Mitigation, Monitoring, and Reporting Requirements

The following mitigation measures, monitoring requirements, and reporting requirements are proposed by BOEM to avoid, minimize, reduce, or eliminate environmental impacts associated with the Proposed Action (herein referred to as the "Project"). Mitigation measures, monitoring requirements, and reporting requirements in the form of terms and conditions are added to the negotiated agreement and are considered enforceable as part of the agreement.

Plans and Performance Requirements

NASA and the USACE will provide the BOEM with a copy of the Project's "Construction Solicitation and Specifications Plan" prior to construction (herein referred to as the "Plan"). The BOEM will review the Plan within two (2) weeks of receiving it. No activity or operation authorized by this MOA at Unnamed Shoal A shall be carried out until the BOEM has had an opportunity to review the Plan, thus ensuring that each activity or operation is conducted in a manner that is in compliance with the provisions and requirements of the MOA. NASA and the USACE will ensure that all operations at Unnamed Shoal A are conducted in accordance with the final approved Plan and all terms and conditions in this MOA, as well as all applicable regulations, orders, guidelines, and directives specified or referenced herein are met.

The preferred method of obtaining and conveying sediment from the Unnamed Shoal A involves the use of a hopper dredge. NASA and the USACE will allow the BOEM to review and comment on modifications to the Plan, including the use of a cutterhead dredge and/or submerged or floated pipelines to convey sediment that may affect the project area, before implementation of the modification. Said comments shall be delivered in a timely fashion in order to not delay the USACE's construction contract or schedule.

NASA and the USACE, at the request of the BOEM, shall allow access at the site of any operation subject to safety regulations, to any authorized Federal inspector and shall provide the BOEM with any documents and records that are pertinent to occupational or public health, safety, or environmental protection as may be requested.

Environmental Responsibilities and Environmental Compliance

NASA is the lead agency on behalf of the Federal government to ensure the Project complies with applicable environmental laws, including but not limited to the ESA, MSA, MMPA, MBTA, NHPA, and CZMA. NASA or the USACE, as designated, is responsible for compliance with the specific conditions of state permits, such as those administered by the Virginia Marine Resources Commission (VMRC) and Virginia Department of Environmental Quality (VDEQ).

NASA is serving as the lead Federal agency for ESA Section 7 consultation concerning protected species under the purview of the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). NASA and USACE will instruct its contractor(s) to implement the mitigation terms, conditions, and measures required by the USFWS, NMFS, VMRC, VDEQ and the BOEM pursuant to applicable Federal and state laws and regulations prior to commencement of activities authorized under this MOA, including extraction, transportation, and placement of sand from Unnamed Shoal A. The required mitigation terms, conditions, and measures are

reflected in the Biological Opinions, Conservation Recommendations, and Consistency Determination (see Attachment 2). Copies of all relevant non-privileged correspondence, monitoring data, and reports related to the activities covered by this MOA will be provided to the BOEM at dredgeinfo@boem.gov electronically within 14 days of issuance (including observer and dredging reports).

Pre-Construction Notification of Activity in or near the Borrow Area

NASA and the USACE will invite BOEM to attend a pre-construction meeting that describes the NASA's and/or its contractors' or agents' plan and schedule to construct the Project.

NASA and the USACE will notify BOEM electronically at least 72 hours prior to the commencement, and within 24 hours after termination, of operations at Unnamed Shoal A. BOEM will electronically notify NASA and the USACE in a timely manner of any OCS activity within the jurisdiction of the DOI that may adversely affect NASA's ability to use OCS sand for the Project.

Dredge Positioning

During all phases of the Project, NASA and USACE will ensure that the dredge and any bottom-disturbing equipment is outfitted with an onboard global positioning system (GPS) capable of maintaining and recording location within an accuracy range of no more than plus or minus 3 meters. The GPS must be installed as close to the dredge as is practicable or must use appropriate instrumentation to accurately represent the position of the dredge. During dredging operations, NASA and USACE will immediately notify the BOEM electronically at dredgeinfo@boem.gov if dredging occurs outside of the approved borrow area. Such notification will be made as soon as possible after the time USACE becomes aware of dredging outside of the approved borrow area. If the internet service is not working, notify the Chief, Leasing Division at (703) 787-1215.

Anchoring, spudding, or other bottom-disturbing activity is to be avoided outside the authorized borrow area on the OCS, except for immediate concerns of safety, navigation risks, or emergency situations.

NASA and USACE will provide the BOEM all appropriate Dredging Quality Management (DQM) data acquired during the Project using procedures jointly developed by the USACE's National DQM Data Program Support Center and BOEM. NASA and USACE will submit the DQM data, including draghead depth, electronically biweekly. A summary DQM dataset will be submitted within 45 days of completion of the Project. If available, the USACE will also submit Automatic Identification System (AIS) data for vessels qualifying under the International Maritime Organization's (IMO) International Convention for the Safety of Life at Sea.

Dredge Operation

Dredging will occur preferentially in naturally accreting areas (subarea A-1 in Unnamed Shoal A) and dredging will be avoided in erosional areas of the shoal to the extent possible. Dredging will be performed so that the hopper dredge excavates material using relatively shallow, uniform passes with a maximum overall cut depth of 2-3 meters. USACE's contract will include the use the contour method to maintain the relative profile and shape of the sand ridge. Longitudinal passes along the entire length of the sand ridge are prohibited to minimize effects on natural shoal maintenance. NASA and USACE will notify the BOEM if dredging must occur in subarea A-2 in Unnamed Shoal A in order to obtain the necessary volume.

Submittal of Production and Volume Information

NASA and USACE, in cooperation with the dredge operator, must submit to BOEM a summary of the dredge track lines, outlining any deviations from the original Plan, on a biweekly basis. A color-coded plot of the cutterhead or drag arms will be submitted, showing any horizontal or vertical dredge violations. The dredge track lines must show dredge status: hotelling, dredging, transiting, or unloading. This map will be provided in PDF format.

NASA and USACE will provide at least a biweekly report electronically of the construction progress, including estimated volumetric production rates to the BOEM. The biweekly deliverables will be provided electronically to dredgeinfo@boem.gov. The project completion report, as described below, will also include production and volume information, including Daily Operational Reports.

Local Notice to Mariners

NASA and USACE will require its contractor(s) for the Project to place a notice in the U.S. Coast Guard Local Notice to Mariners regarding the timeframe and location of dredging and construction operations in advance of commencement of dredging.

Marine Pollution Control and Contingency Plan

NASA and USACE will require its contractor(s) and subcontractor(s) to prepare for and take all necessary precautions to prevent discharges of oil and releases of waste or hazardous materials that may impair water quality. In the event of such an occurrence, notification and response will be in accordance with applicable requirements of 40 C.F.R. 300. All dredging and support operations must be compliant with U.S. Coast Guard regulations and the U.S. Environmental Protection Agency's Vessel General Permit, as applicable. NASA will notify the BOEM of any noncompliant discharges and remedial actions and provide copies of reports of the incident and resultant actions electronically at dredgeinfo@boem.gov.

Encounter of Ordnance

If any ordnance is encountered while conducting dredging activities at Unnamed Shoal A, NASA and the USACE will report the discovery within 24 hours to: Chief, BOEM Leasing Division, at (703) 787-1215 and dredgeinfo@boem.gov.

Bathymetric Surveys

NASA and USACE will provide the BOEM with pre- and post-dredging bathymetric surveys of Unnamed Shoal A. The pre-dredging survey will be conducted within 30 days prior to dredging. The post-dredging survey will be conducted within 30 days after the completion of dredging. NASA and USACE will provide any future bathymetric surveys of Unnamed Shoal A completed by the USACE or NASA (over the next 1 to 3 years) to BOEM. Hydrographic surveys will be performed in accordance with the USACE Hydrographic Surveying Manual EM 1110-2-1003, unless specified otherwise, providing one hundred percent seamless coverage using interferometric swath or multibeam bathymetry data. All bathymetric data will be roll, pitch, heave, and tide corrected using accepted practices. Survey lines of the specific dredge area, within Unnamed Shoal A, will be established at no greater than 50-m intervals perpendicular to a baseline. Three equidistant cross-tie lines will be established parallel to the same baseline. All survey lines will extend at least 50 m beyond the edge of the dredge areas. All data will be collected in such a manner that post-dredging bathymetry surveys are compatible with the pre-dredging bathymetric survey data to enable the latter to be subtracted from the former to calculate the volume of sand removed, the shape of the excavation, and nature of post-dredging bathymetric change.

Copies of pre-dredging and post-dredging hydrographic data will be submitted to the BOEM electronically via dredgeinfo@boem.gov within thirty (30) days after each survey is completed. The delivery format for data submission is an ASCII file containing corrected x, y, z data. The horizontal data will be provided in the North American Datum of 1983 (NAD '83) Virginia State Plane, U.S. survey feet unless otherwise specified. Vertical data will be provided in the North American Vertical Datum of 1988 (NAVD '88), U.S. survey feet unless otherwise specified. A full 24-by-36-inch plan view plot of the pre- and post-construction data will be provided showing the individual survey points and/or vessel track lines, as well as contour lines at appropriate elevation intervals. These plots will be provided in PDF format. Survey metadata will also be provided.

Archaeological Resources

Onshore Prehistoric or Historic Resources

If NASA, the USACE, or it's contractor discovers any previously unknown historic or archeological resources while accomplishing the Project on Wallops Island, NASA and USACE will notify the BOEM of any finding. As Lead Agency, NASA will initiate the Federal and state coordination required to determine if the resources warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

Offshore Prehistoric or Historic Resources

In the event that the dredge operators discover any archaeological resources prior to dredging operations in the SABA or in the vicinity of pump-out operations, NASA will report the discovery electronically to BOEM in a timely manner. The USACE and NASA will coordinate with BOEM on the measures needed to evaluate, avoid, protect, and, if needed, mitigate adverse impacts from an unanticipated discovery. If investigations determine that the resource is

significant, the parties will together determine how best to protect the resource. If the parties and/or dredge operators discover any archaeological resources while conducting dredging operations, NASA will require that dredge and/or pump-out operations be halted immediately within 305 m (1,000 ft) of the area of discovery. NASA will then immediately report the discovery electronically to the Chief, Division of Environmental Assessment. The USACE and NASA will coordinate with BOEM on the measures needed to evaluate, avoid, protect, and, if needed, mitigate adverse impacts from an unanticipated discovery. If investigations determine that the resource is significant, the parties will together determine how best to protect the resource.

12. Responsibilities

BOEM does not warrant that the OCS sand resources used in this project are suitable for the purpose for which they are intended by NASA and the USACE. BOEM's responsibility under this Project is limited to the authorization of access to OCS sand resources from Unnamed Shoal A and therefore BOEM disclaims any and all responsibility for the physical and financial activities undertaken by other Parties in pursuit of the Project.

13. Project Completion Report

A project completion report will be submitted by NASA and USACE to the BOEM within 120 days following completion of the activities authorized under the MOA. This report and supporting materials should be sent in writing and electronically to the Chief, BOEMRE Leasing Division, 381 Elden Street, MS 4010, Herndon, Virginia 20170 and dredgeinfo@boem.gov.

The report will contain, at a minimum, the following information:

- the names and titles of the project managers overseeing the effort (for the USACE, the engineering firm (if applicable), and the contractor), including contact information (phone numbers, mailing addresses, and email addresses);
- the location and description of the project, including the final total volume of material extracted from the borrow area and the volume of material actually placed on the beach or shoreline (including a description of the volume calculation method used to determine these volumes);
- DQM data, in ASCII files, containing the x, y, z and time stamp of the cutterhead or drag arm locations;
- a narrative describing the final, as-built features, boundaries, and acreage, including the restored beach width and length;
- a narrative discussing the construction sequences and activities, and, if applicable, any problems encountered and solutions;
- a list and description of any construction change orders issued, if applicable;
- a list and description of any safety-related issues or accidents reported during the life of the project;
- a narrative and any appropriate tables describing any environmental surveys or efforts associated with the project and costs associated with these surveys or efforts;

- a table, an example of which is illustrated below, showing the various key project cost elements;

	Cost Incurred as of Construction Completion ($)
Construction	
Engineering and Design	
Pre- and Post-Dredging Bathymetric Surveys	
Compilation of Project Completion Report	
Total	

- a table showing the various phases of the project construction, the types of construction equipment used, the nature of their use;
- a table listing significant construction dates beginning with bid opening and ending with final acceptance of the project by the USACE;
- digital appendices containing the as-built surveys, beach-fill cross-sections, and survey data; and
- any additional pertinent comments.

- a table, an example of which is illustrated below, showing the various items of work construction, final quantities, and monetary amounts;

Item No.	Item	Estimated Quantity	Unit	Unit Price	Estimated Amount	Final Quantity	Bid Unit Price	Final Amount	% Over/ Under
1	Mobilization and Demobilization								
2	Beach Fill								
3	Any beach or offshore hard structure placed or removed								

- a listing of construction and construction oversight information, including the prime and subcontractors, contract costs, etc.;
- a list of all major equipment used to construct the project;
- a narrative discussing the construction sequences and activities, and, if applicable, any problems encountered and solutions;
- a list and description of any construction change orders issued, if applicable;
- a list and description of any safety-related issues or accidents reported during the life of the project;
- a narrative and any appropriate tables describing any environmental surveys or efforts associated with the project and costs associated with these surveys or efforts;

- a table listing significant construction dates beginning with bid opening and ending with final acceptance of the project by NASA and/or the USACE; digital appendices containing the as-built drawings, beach-fill cross-sections, and survey data; and any additional pertinent comments.

Attachment 2

Final Environmental Assessment with Appendices

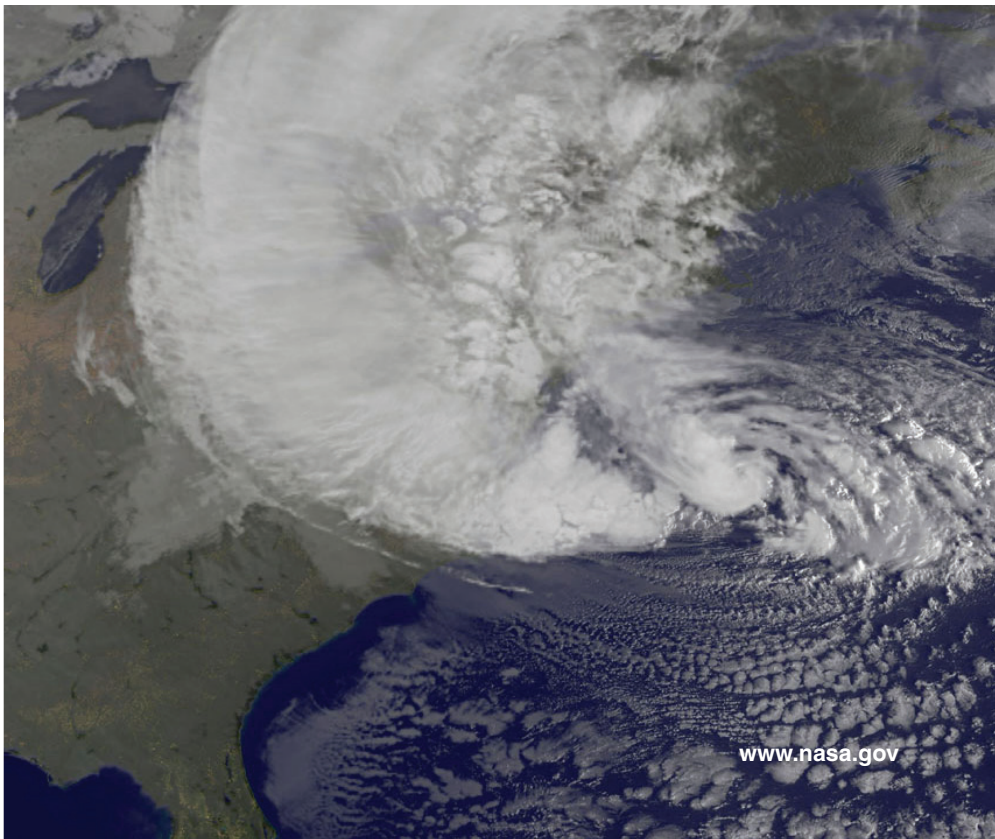
National Aeronautics and
Space Administration

Final Environmental Assessment

Wallops Island Post-Hurricane Sandy Shoreline Repair

June 2013

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



Cover images: (from top left down)
Wallops Island in August 2012 following completion of initial beach fill – Photo Credit: Patrick Hendrickson
Beach fill activities adjacent to launch Pad 0-A – Photo Credit: Patrick Hendrickson
Hopper dredge and booster station offshore of Wallops Island – Photo Credit: Patrick Hendrickson
Hurricane Sandy beach damage east of launch Pad 0-A – Photo Credit: Josh Bundick
Beach construction east of launch pad 0-B – Photo Credit: NASA Optics Lab

(front cover, bottom right and back cover)
Hurricane Sandy taken from earth observing satellite – Image Credit: NASA GOES Project

National Aeronautics and
Space Administration

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

Reply to Attn of: 250.W

June 2013

Dear Reader:

This is the Final Environmental Assessment (FEA) for NASA's proposed Post-Hurricane Sandy Shoreline Repair project at Wallops Flight Facility (WFF), Wallops Island, Virginia.

Prepared in accordance with the National Environmental Policy Act (NEPA), the FEA evaluates the environmental consequences of 1) the repair of the Wallops Island rock seawall; and 2) the placement of approximately 800,000 cubic yards of sand along the southern two-thirds of the Wallops Island shoreline. In addition to the Proposed Action, the FEA evaluates the No Action Alternative.

NASA considered all comments received on the Draft EA (DEA) in preparing the FEA. Comments received on the DEA and NASA's responses to those comments are included as Appendix B.

An electronic version of the FEA is available on the project website at: **http://sites.wff.nasa.gov/code250/Tiered_Shoreline_Renourishment_EA.html**.

The FEA is also available for review at the Eastern Shore Public Library, Accomac, Virginia; the Chincoteague Island Library, Chincoteague Island, Virginia; and the NASA WFF Visitor's Center, Wallops Island, Virginia. A limited number of hard copies of the FEA are available on a first request basis.

Please direct all requests for copies and questions regarding the FEA to Mr. Joshua Bundick of the WFF Environmental Office. He can be reached at one of the following:

Mail: NASA Wallops Flight Facility
Mailstop: 250.W
Wallops Island, VA 23337

Email: Joshua.A.Bundick@nasa.gov
Phone: (757) 824-2319
Fax: (757) 824-1819

Thank you for your participation in this process!

FINAL ENVIRONMENTAL ASSESSMENT
WALLOPS ISLAND POST-HURRICANE SANDY SHORELINE REPAIR

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

Lead Agency:	National Aeronautics and Space Administration
Cooperating Agencies:	Bureau of Ocean Energy Management U.S. Army Corps of Engineers
Proposed Action:	Wallops Island Post-Hurricane Sandy Shoreline Repair
For Further Information:	Joshua A. Bundick Lead, Environmental Planning National Aeronautics and Space Administration Goddard Space Flight Center Wallops Flight Facility Wallops Island, VA 23337 (757) 824-2319 Joshua.A.Bundick@nasa.gov
Date:	June 2013

ABSTRACT

This Environmental Assessment (EA) addresses the proposed repair of the Wallops Island shoreline owned by the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center's Wallops Flight Facility, located in Accomack County, Virginia. Under the Proposed Action, NASA would fund the placement of up to approximately 800,000 cubic yards of sand dredged from an offshore shoal. Additionally, should funds permit, NASA would repair a portion of its rock seawall. The project would restore the Wallops Island shoreline to its condition prior to Hurricane Sandy, a coastal storm that occurred in late October 2012.

This EA analyzes the potential direct, indirect, and cumulative environmental effects of two alternatives: the Proposed Action and the No Action Alternative. Resources evaluated in detail include coastal processes; water quality; the coastal zone; air quality; noise; benthos; wildlife; finfish and habitat; marine mammals; threatened and endangered species; and cultural resources.

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

Table of Figures iv

Table of Tables iv

1 INTRODUCTION AND PURPOSE AND NEED FOR ACTION 1-1

1.1 Background 1-1

1.1.1 Relationship to Final PEIS 1-2

1.1.2 Cooperating Agencies 1-2

1.2 Hurricane Sandy 1-3

1.2.1 Overall Storm Description 1-3

1.2.2 Conditions Experienced at WFF 1-3

1.3 Purpose and Need for the Proposed Action 1-5

1.3.1 Purpose 1-5

1.3.2 Need 1-5

1.3.3 Cooperating Agency Purpose and Need 1-5

1.4 Changes Between Draft and Final EA 1-8

2 PROPOSED ACTION AND ALTERNATIVES 2-1

2.1 Introduction 2-1

2.2 No Action Alternative 2-1

2.3 Proposed Action 2-1

2.3.1 Seawall Repair 2-1

2.3.2 Beach Fill Mobilization 2-6

2.3.3 Dredging and Sand Placement 2-8

2.3.4 Post-Dredging Activities 2-12

2.3.5 Consideration of Sea Level Rise 2-13

2.4 Summary of Proposed Action 2-14

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 3-1

3.1 Physical Environment 3-3

3.1.1 Coastal Geology and Processes 3-3

3.1.1.1 Affected Environment 3-3

3.1.1.2 Environmental Consequences 3-6

3.1.2 Water Quality *3-10*
3.1.2.1 Regulatory Context 3-10
3.1.2.2 Affected Environment 3-10
3.1.2.3 Environmental Consequences 3-10
3.1.3 Coastal Zone Management *3-12*
3.1.3.1 Regulatory Context 3-12
3.1.3.2 Affected Environment 3-12
3.1.3.3 Environmental Consequences 3-12
3.1.4 Air Quality *3-13*
3.1.4.1 Affected Environment 3-13
3.1.4.2 Environmental Consequences 3-14
3.1.5 Noise *3-14*
3.1.5.1 Affected Environment 3-15
3.1.5.2 Environmental Consequences 3-16
3.2 Biological Environment 3-17
3.2.1 Benthos *3-17*
3.2.1.1 Affected Environment 3-17
3.2.1.2 Environmental Consequences 3-18
3.2.2 Wildlife *3-19*
3.2.2.1 Affected Environment 3-19
3.2.2.2 Environmental Consequences 3-21
3.2.3 Fisheries & Essential Fish Habitat *3-22*
3.2.3.1 Regulatory Context 3-22
3.2.3.2 Affected Environment 3-23
3.2.3.3 Environmental Consequences 3-23
3.2.4 Marine Mammals *3-24*
3.2.4.1 Regulatory Context 3-24
3.2.4.2 Affected Environment 3-25
3.2.4.3 Environmental Consequences 3-25
3.2.5 Threatened & Endangered Species *3-27*
3.2.5.1 Regulatory Context 3-27

3.2.5.2 Affected Environment 3-27
3.2.5.3 Environmental Consequences 3-28
3.3 Social Environment 3-31
3.3.1 Cultural Resources 3-31
3.3.1.1 Regulatory Context 3-31
3.3.1.2 Affected Environment 3-32
3.3.1.3 Environmental Consequences 3-32
3.4 Cumulative Effects 3-33
3.4.1 Resources Evaluated 3-33
3.4.2 Actions Included 3-33
3.4.2.1 Wallops Island Initial Beach Fill and Seawall Extension 3-34
3.4.2.2 Wallops Island Range Activities 3-34
3.4.2.3 North Wallops Island Unmanned Aerial Systems Airstrip 3-35
3.4.2.4 Installation and Operation of a U.S. Navy Powder Gun and Railgun 3-35
3.4.2.5 Wallops Island Beach Motorized Uses 3-35
3.4.2.6 Wallops Island Predator Management 3-36
3.4.2.7 Wallops Island Protected Species Monitoring 3-36
3.4.3 Potential Cumulative Effects 3-36
3.4.3.1 Coastal Geology and Processes 3-36
3.4.3.2 Benthos 3-37
3.4.3.3 Wildlife 3-37
3.4.3.4 Essential Fish Habitat 3-38
3.4.3.5 Threatened and Endangered Species 3-39
4 REFERENCES CITED 4-1
5 AGENCIES AND PERSONS CONSULTED 5-1
6 PREPARERS AND CONTRIBUTORS 6-1

APPENDIX A ..... AGENCY COORDINATION
APPENDIX B ..... COMMENTS RECEIVED ON DRAFT EA

Table of Figures

Figure 1-1: Wallops Island during Hurricanes Sandy and Irene 1-4
Figure 1-2: Hurricane Sandy Beach Damage on South Wallops Island, Looking South 1-6
Figure 1-3: Hurricane Sandy Seawall Damage at Z-100 Camera Stand, Looking North 1-6
Figure 1-4: Cross Section Showing Hurricane Sandy-Induced Shoreline Change at Pad 0-A ... 1-7

Figure 2-1: Project Overview 2-3
Figure 2-2: General Extent of Proposed Repairs 2-5
Figure 2-3: Installation of Marine Mattresses 2-6
Figure 2-4: Offshore Equipment Including Derrick, Tugs, and Barges 2-7
Figure 2-5: Onshore Equipment Staging Area 2-7
Figure 2-6: Trailing Suction Hopper Dredge with Dragarms Raised 2-8
Figure 2-7: Bulldozers Grading Newly Discharged Sand 2-9
Figure 2-8: Typical Renourishment Design Template 2-11
Figure 2-9: Installing Sand Fencing and Planting Dune Grasses 2-12
Figure 2-10: Comparison of SLR Estimates from King et al. (2011) and GISS (2012)..... 2-13

Figure 3-1: Beach Profile Changes at Pad 0-A 3-5
Figure 3-2: Summary of Changes to Borrow Area from Initial Beach Fill 3-7
Figure 3-3: Selected Cross-Sections Depicting Changes to Borrow Area from Initial Fill 3-8
Figure 3-4: Recent Listed Species Nests in Relation to Proposed Action 3-29

Table of Tables

Table 2-1: Summary of Proposed Action 2-14

Table 3-1: Resources Considered for Analysis in this EA 3-2
Table 3-2: Renourishment Cycle Criteria Pollutant and Greenhouse Gas Emissions 3-14
Table 3-3: Estimated Distances to NMFS Underwater Noise Thresholds 3-26
Table 3-4: Resources Considered for Cumulative Effects 3-34

1 Introduction and Purpose and Need for Action

1.1 Background

The National Aeronautics and Space Administration (NASA) has prepared this Environmental Assessment (EA) to evaluate the potential environmental impacts of its proposed post-Hurricane Sandy shoreline repair project at Wallops Flight Facility (WFF). This EA has been prepared in accordance with the National Environmental Policy Act (NEPA), as amended (Title 42 of the United States Code [U.S.C.] 4321–4347), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508), NASA's regulations for implementing NEPA (14 CFR Subpart 1216.3), and the *NASA Procedural Requirement (NPR) for Implementing NEPA and Executive Order (EO) 12114* (NPR 8580.1).

On December 13, 2010, NASA issued a *Record of Decision (ROD)*[1] for its *Final Programmatic Environmental Impact Statement Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (Final PEIS).*[2] In its *ROD*, NASA selected for implementation Alternative 1, Seawall Extension and Beach Fill, and adopted a suite of mitigation and monitoring protocols to both reduce potential environmental impacts and track project performance.

As identified in the *Final PEIS* and *ROD*, the initial phase of Alternative 1 entailed the placement along the Wallops Island shoreline of approximately 3.2 million cubic yards (CY) of sand dredged from an offshore shoal in the Atlantic Ocean. Additionally, Alternative 1 included an initial 1,415-foot (ft) southerly extension of the Wallops Island rock seawall, with future extensions completed on a funds-available basis to a maximum length of 4,600 ft. Alternative 1 also accounted for an estimated nine beach renourishment cycles at approximately five-year intervals.

Since issuing its *ROD*, NASA and the U.S. Army Corps of Engineers (USACE), Norfolk District, oversaw the initial seawall extension between August 2011 and March 2012, with beach nourishment occurring between April and August 2012. Both during and after completing the initial phase of the project, the agencies have sponsored multiple topographic and hydrographic surveys of the project site. The most recent monitoring effort, conducted in November 2012 following Hurricane Sandy (which made landfall in late October 2012), identified the need to repair the southern two-thirds of the recently nourished beach and a section of the seawall.

Subsequent to NASA identifying this need, Public Law 113-2, *Disaster Relief Appropriations Act, 2013*, was signed into law on January 29, 2013. Within the bill is a provision for NASA to repair its facilities that sustained damages during Hurricane Sandy. Accordingly, NASA has prepared this EA to assist in the decision-making process.

[1] The *ROD* is available online at http://sites.wff.nasa.gov/code250/docs/SRIPP_ROD_SIGNED.pdf.
[2] The *Final PEIS* is available online at http://sites.wff.nasa.gov/code250/final_sripp_peis_document.html.

1.1.1 Relationship to Final PEIS

Both CEQ and NASA NEPA regulations allow for the preparation of NEPA documents for broad actions, such as agency programs and sets of related or similar actions. These NEPA documents are referred to as "programmatic," and are often broad in scope, and may be followed by more site- or action-specific documents as appropriate. This approach, referred to as "tiering," can be compared to a funnel, with the broader, programmatic NEPA document at the top, with the more focused documents below it.

In descending the funnel, the NEPA documents for the individual actions within the interrelated program have a narrower, project-specific focus. The impacts of common issues are addressed in the programmatic EIS, then a series of more narrowly focused individual project-specific EAs or EISs are tiered, addressing project-specific issues. The more narrowly focused EISs and EAs do not repeat the impact analyses of common issues from the broad EIS, rather they summarize those analyses and incorporate them by reference while focusing on the unique project-specific issues at hand.

The *Final PEIS* was prepared as a programmatic document to assess the environmental consequences from a 50-year design life storm damage reduction program at WFF. The document describes an initial beach fill cycle followed by an estimated 9 renourishment cycles to maintain a target level of storm damage reduction. The *Final PEIS* estimates the volume of sand needed for each renourishment cycle and considers multiple material sources, both onshore and offshore, for obtaining beach-quality sand. The document also considers the effects of either repairing or extending the Wallops Island rock seawall south up to a maximum of 4,600 ft from its calendar year 2010 terminus.

Consistent with the NEPA approach outlined for the *Final PEIS*, NASA has prepared this EA as a tiered document focusing specifically on the proposed renourishment and seawall repair. As such, much of the *Final PEIS* is incorporated by reference with new information and analysis provided as appropriate.

1.1.2 Cooperating Agencies

NASA, as the WFF property owner and project proponent, is the Lead Agency in preparing this EA. The U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) and the USACE have served as Cooperating Agencies because they each possess both regulatory authority and specialized expertise regarding the Proposed Action.

NASA would require authorizations from both the BOEM and the USACE to undertake the proposed project. The BOEM has jurisdiction over mineral resources on the Federal Outer Continental Shelf (OCS). A Memorandum of Agreement (MOA) pursuant to section 8(k)(2)(d) of the OCS Lands Act, 43 U.S.C. § 1337(k)(2), would be negotiated among BOEM, USACE, and NASA to allow the dredging of sand from the OCS.

Under Section 404 of the Clean Water Act (CWA), the 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 of Act of 1899 (RHA), the USACE has jurisdiction over the placement of structures and work conducted in navigable waters of the U.S. Finally, in addition to its regulatory role in the project, the USACE Norfolk District is overseeing project design, construction, and monitoring on NASA's behalf.

1.2 Hurricane Sandy

1.2.1 Overall Storm Description

Hurricane Sandy began as Tropical Depression 18 and reached hurricane strength on Oct. 23, 2012. Though it behaved much like a tropical cyclone while in the lower latitudes, as the storm moved northward, it merged with a weather system arriving from the west and transitioned into an extra-tropical cyclone.

In contrast to tropical cyclones, which draw their energy from warm ocean waters, extra-tropical cyclones are driven by sharp temperature contrasts between masses of warm and cool air. A key result of this difference is that when tropical cyclones become extra-tropical, their wind and cloud fields expand dramatically. Their strongest winds generally weaken during this process, but occasionally a storm retains hurricane force winds, as was the case with Sandy.

As Hurricane Sandy arrived in the mid-Atlantic region, it became wedged between a stationary cold front over the Appalachians and a static high-pressure air mass over maritime Canada. The air masses blocked the storm from moving north or east, as would normally occur. Instead, this interaction amplified Sandy and drove it ashore. As it moved ashore, Sandy became a very strong Nor'easter, causing substantial damage to areas of the northeast U.S., particularly coastal New Jersey and New York on the evening of October 29. By the early morning hours of Wednesday, October 31, Sandy had weakened to an area of low pressure over western Pennsylvania.

1.2.2 Conditions Experienced at WFF

By the afternoon of Sunday, October 28, Sandy was a marginal Category 1 hurricane several hundred miles east of Cape Hatteras, North Carolina. Winds at WFF steadily intensified during the afternoon and evening hours on Sunday, gusting up to tropical storm force levels (39 miles per hour [mph]). On the morning of Monday, October 29, winds continued to increase, frequently gusting in the mid-40s (mph). The highest winds were experienced during the late afternoon on October 29, with a maximum recorded wind gust of 68 mph occurring at 4:52 p.m. Winds remained strong during the evening and slowly subsided during the overnight hours into Tuesday morning. Total rainfall at WFF was measured was just under 8.5 inches (in) with most of the rain (more than 6.5 in) occurring on October 29.

Though WFF does not have its own tide station, the storm surge experienced during Sandy can be estimated from the tidal station at Wachapreague, Virginia, approximately 20 mi to the south. During the high tide cycle on the morning of Monday, October 29, the storm surge at Wachapreague reached nearly 4 ft above normal, which also corresponds to the general time when Wallops Island experienced its highest water levels of about the same magnitude. During the previous low tide cycle (early morning of October 29), the area experienced its largest surge of nearly 5 ft. However, given the point in the tidal cycle, overall water levels were not as high as later that day.

In comparison to other recent storms, the conditions (e.g., winds, storm surge) experienced at WFF were comparable to those during Hurricane Irene in August 2011. Figure 1-1 depicts the extent of damage reduction afforded by the recently constructed beach. Both photographs were taken from the same vantage point (mid-Island) at approximately 1 hour before high tide.

Figure 1-1: Wallops Island during Hurricanes Sandy (top) and Irene (bottom)

1.3 Purpose and Need for the Proposed Action

1.3.1 Purpose

The purpose of NASA's Proposed Action is to restore the Wallops Island shoreline to its pre-Hurricane Sandy condition.

1.3.2 Need

The Proposed Action is needed because the existing beach cannot provide the level of storm damage reduction for which it was originally designed. Although the Wallops Island beach served its intended purpose of reducing damage to the Island's infrastructure during the storm, it was at its own expense (Figures 1-2 and 1-3). A substantial volume of sub-aerial (above water) sand was relocated to sub-aqueous (under water) areas, especially in the cross-shore direction (Figure 1-4).

Based upon post-storm assessments of the beach, it is evident that the area which sustained the greatest damage is the southern two-thirds of the recently nourished beach, behind which are located some of NASA and the Commonwealth of Virginia's most critical launch assets, including Launch Complex 0 and multiple sounding rocket pads. Of particular concern is the fact that the seaward half of the dune has been lost in most places and the beach berm has been lowered by at least several feet (also shown in Figure 1-4). Although it can be expected that some of the sand moved offshore will eventually move back into the intertidal zone on the beach, those areas of highest elevation (i.e., dune and berm) would require renourishment to regain their full functionality.

The rock seawall on Wallops Island sustained minimal damage during Hurricane Sandy with the exception of the revetment east of camera stand Z-100 at the southernmost terminus of the project site. While the structure likely afforded some damage reduction to the infrastructure behind it, due to its less-robust design (which pre-dated the design described in King et al. [2011] and the *Final PEIS)*, the structure was notably damaged (Figure 1-3).

1.3.3 Cooperating Agency Purpose and Need

The BOEM and the USACE, as cooperating Federal agencies, would each undertake a "connected action" (40 CFR 1508.25) that is related to, but unique from NASA's proposed action, the funding of the project. The purpose of BOEM's proposed action is to consider NASA's request for the use of OCS sand resources in renourishing the Wallops Island beach.

The purpose of USACE's proposed action is to consider NASA's request for authorization to: 1) discharge fill material into waters of the U.S. under Section 404 of the CWA; and 2) conduct work in navigable waters of the U.S. under Section 10 of the RHA.

The BOEM and USACE proposed actions are needed to fulfill each agency's jurisdictional responsibilities under the OCS Lands Act and the CWA and RHA, respectively.

Figure 1-2: Hurricane Sandy Beach Damage on South Wallops Island, Looking South

Figure 1-3: Hurricane Sandy Seawall Damage at Z-100 Camera Stand, Looking North

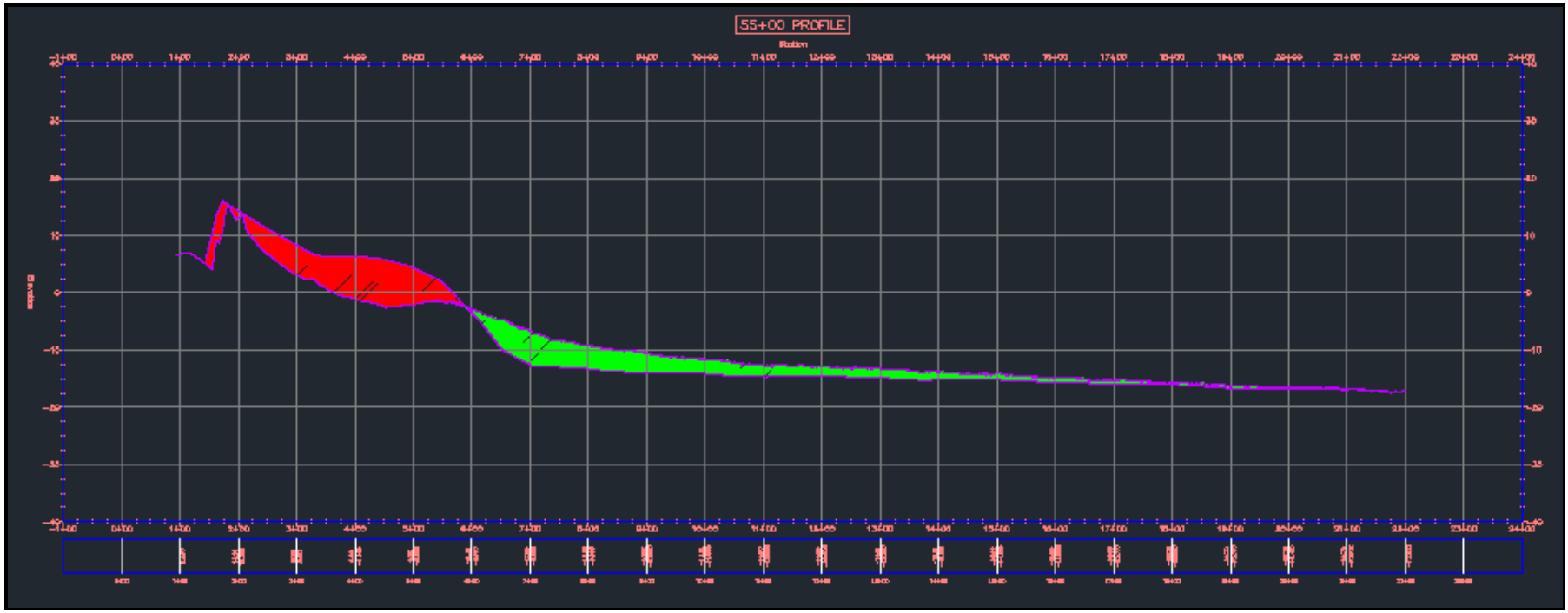


Figure 1-4: Cross Section Showing Hurricane Sandy-Induced Shoreline Change at Pad 0-A

Red shading indicates erosion; green shading indicates deposition

1.4 Changes Between Draft and Final EA

Based upon comments received on the Draft EA, consultations with resource agencies, and its own internal review, NASA made the following substantive changes to the document which are reflected in this Final EA:

- A discussion of a proposed modification to the beach berm elevation has been added to Sections 2.3.3, 3.1.2.3, and 3.1.3.3;
- A summary of the Coastal Zone Management Act consultation has been added to Section 3.1.3.3;
- A summary of the Essential Fish Habitat consultation has been added to Section 3.2.3.3;
- A discussion of seabeach amaranth has been added to Section 3.2.5;
- A reasonably foreseeable future action, the U.S. Navy powder gun and railgun project, has been added to the cumulative effects analysis in Section 3.4.2.4;
- Correspondence with resource agencies has been added to Appendix A; and
- Comments received on the Draft EA and NASA's responses to those comments have been included as Appendix B.

2 Proposed Action and Alternatives

2.1 Introduction

This section provides a discussion of the alternatives under consideration for the repair of the Wallops Island shoreline. The *Final PEIS* considered in detail a range of potential storm damage reduction alternatives, including structural and non-structural options, varying beach berm widths, and multiple sources of fill material. Based upon a combination of economic, engineering, and environmental factors, in its *ROD* NASA selected for implementation the alternative (Alternative 1) that would best meet its needs. Therefore, the focus of this EA is returning the Wallops Island shoreline to the condition described and analyzed for Alternative 1 in the *Final PEIS*. Accordingly, the No Action Alternative and the Proposed Action are evaluated in this EA.

2.2 No Action Alternative

CEQ regulations require that an agency "include the alternative of no action" as one of the alternatives it considers (40 CFR 1502.14[d]). The No Action Alternative serves as a baseline against which the impacts of the Proposed Action are compared. Under the No Action Alternative for this EA, NASA would not renourish the Wallops Island beach or repair the rock seawall to return them to their pre-Hurricane Sandy condition.

2.3 Proposed Action

Consistent with the renourishment component of Alternative 1 described in detail in the *Final PEIS*, NASA's Proposed Action is to dredge sand from an offshore shoal and place it within the area of the Wallops Island beach that sustained the greatest level of storm damage (Figure 2-1). The subject area is generally defined as the 2.3 miles of shoreline starting at the Z-100 camera stand at the south and ending north of the Horizontal Integration Facility (HIF) located mid-Island (Figure 2-2). Additionally, although beach fill is the primary impetus for the project, should funds be available, NASA would also repair its existing rock seawall at the south end of the project site (also shown in Figures 2-1 and 2-2).

2.3.1 Seawall Repair

Consistent with the description in the *Final PEIS*, seawall repair would occur prior to beach nourishment such that the fill material could be used to cover the rock structure. Based upon experience gained during the initial seawall extension, it is expected that some rock could be "recycled" from the existing structure with other materials hauled to Wallops Island from an off-site location, staged at a nearby upland site on WFF property, and then moved from the stockpile to the placement site by dump trucks. At the placement site, one or more excavators would have already moved the existing dune and rock material to a nearby stockpile and excavated additional material from below grade to install "marine mattresses" as a base (Figure 2-3). These same excavators would also position all rocks into place.

THIS PAGE INTENTIONALLY LEFT BLANK

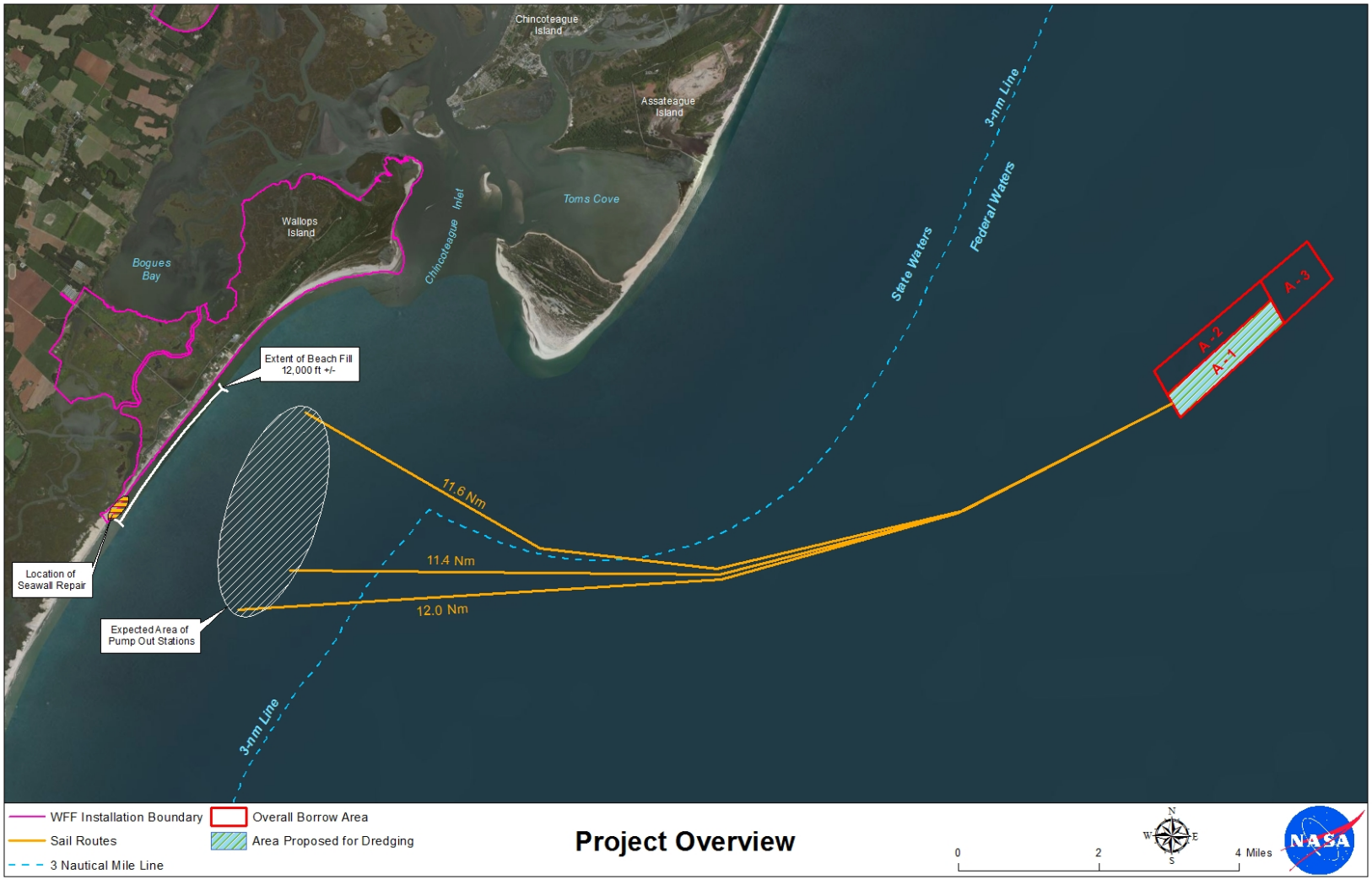


Figure 2-1: Project Overview Showing Borrow Area, Transit Routes, Pump out Areas, Beach Fill, and Seawall Repair

THIS PAGE INTENTIONALLY LEFT BLANK

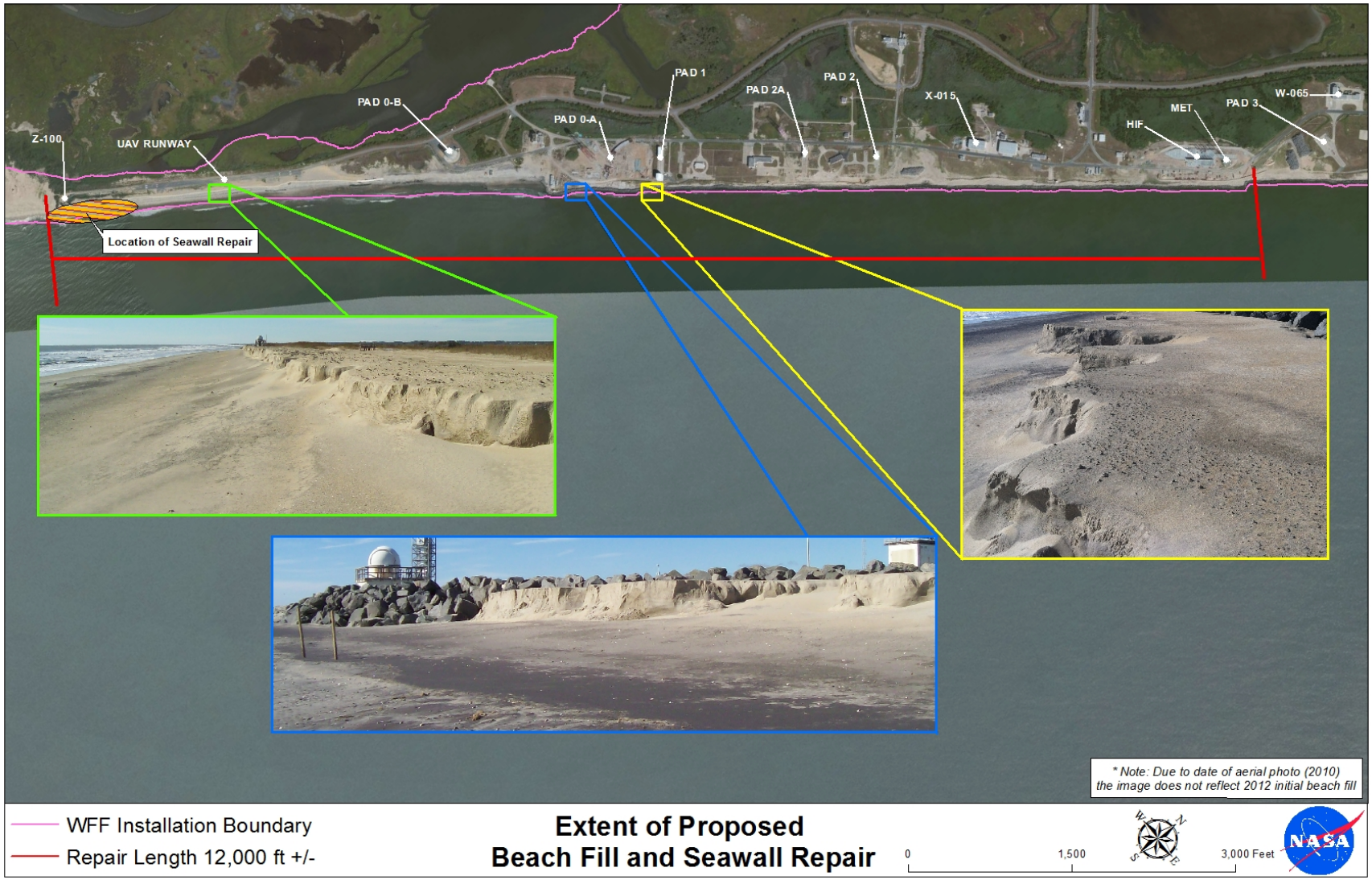


Figure 2-2: General Extent of Proposed Repairs

Figure 2-3: Installation of Marine Mattresses

Because the actual extent of seawall repair would be based upon available funds, the exact length is not known at this time. However, to provide perspective, it is expected that the actual linear distance would be on the order of hundreds of feet, and would remain within the maximum 4,600-ft maximum distance and footprint described in the *Final PEIS.*

2.3.2 Beach Fill Mobilization

The first phase of the beach fill portion of the project would focus on the dredge contractor transporting equipment and materials to the project site, with the assembly of the offshore equipment requiring the greatest amount of lead-time. Offshore equipment would include at least several miles of discharge pipe, multiple barges, tugboats, derricks, and smaller crew transportation vessels (Figure 2-4). Based upon experience gained during the initial beach fill cycle, it is expected that the discharge lines would be assembled inside the protected waters of Chincoteague Inlet, then "rafted" together, and floated to 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 (Figure 2-5). Other onshore support equipment would likely be trucked in and would include multiple bulldozers, several all-terrain vehicles (ATVs), an office trailer, mobile generators, construction site lighting, and mobile fuel tanks.

Another important component of the mobilization phase is the performance of pre-project topographic and hydrographic surveys. Offshore, the dredge contractor would employ vessels to survey the borrow area, the nearshore zone within which dredge pumpout equipment would be placed, and the shallower areas of proposed transit routes. Onshore, multiple survey crews would employ ATVs and light trucks to conduct pre-project surveys of the project site.

Figure 2-4: Offshore Equipment Including Derrick, Tugs, and Barges

Figure 2-5: Onshore Equipment Staging Area

2.3.3 Dredging and Sand Placement

Upon receipt of all necessary authorizations, the USACE (on NASA's behalf) would contract the placement of up to 800,000 CY of sand dredged from the same borrow area (Unnamed Shoal A, sub-area A-1) that was the source of material for the initial beach fill. Given the distance of the borrow area from Wallops Island (12 nautical mi +/- each way), it is expected that the contractor would again use one or more trailing suction hopper dredges to obtain the material (Figure 2-6).

The dredging process would be cyclic in nature, with the vessel transiting to the borrow area, lowering its dragarms, filling its hopper, and returning to a predetermined discharge site. At the discharge site, the dredge would connect to the floating end of the submerged line to pump the material onto the beach. Once the hopper has discharged its entire load, the dredge would return to the borrow area to remove more material.

Because of overflow from the hopper dredge at the borrow area during dredging and losses during discharge and placement, a larger volume of material would need to be dredged to meet the targeted fill volume. Based on information from other shoreline restoration projects, sediment losses during dredging and placement operations may be up to 25 percent. Assuming a conservative 25 percent loss, the dredged volume for the proposed renourishment would be approximately 1,000,000 CY.

Figure 2-6: Trailing Suction Hopper Dredge with Dragarms Raised

Similar to the initial fill cycle, dredging would be conducted in a manner generally consistent with the recommendations of two publications examining the effects of dredging of offshore shoals in the mid-Atlantic (CSA International, Inc. et al. 2009 and Dibajnia and Nairn 2011).

More specifically, NASA would:

- Target Shoal A sub-area A-1 (an accretional area) for beach fill material. Shoal A sub-area A-2 would only be used during off-nominal conditions (e.g., discovery of incompatible material, ordnance, archaeological resource, etc.);
- Dredge over a large area and not create deep pits;
- Require that cut depth not be excessive at approximately 7-10 ft; and
- Require that dredging not occur over the entire length of the shoal.

Nearshore, it is expected that the contractor would employ one or more anchored pumpout stations approximately 2 miles east of Wallops Island in 25-30 ft of water. Up to several miles of submerged steel pipeline would be temporarily placed on the seafloor and would be the conduit through which the sand/water slurry would be pumped from the dredge to the beach.

As the sand slurry is discharged onto the shoreline, bulldozers would grade the material (Figure 2-7) to the desired design template (Figure 2-8), which is proposed to include an additional foot of berm elevation (raised from +6 ft to +7 ft [referencing North American Vertical Datum of 1988]) as compared to the initial beach fill. The purpose of this design change would be to provide an additional buffer during storm conditions.

The time in the tidal cycle would factor into 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.

Figure 2-7: Bulldozers Grading Newly Discharged Sand

THIS PAGE INTENTIONALLY LEFT BLANK

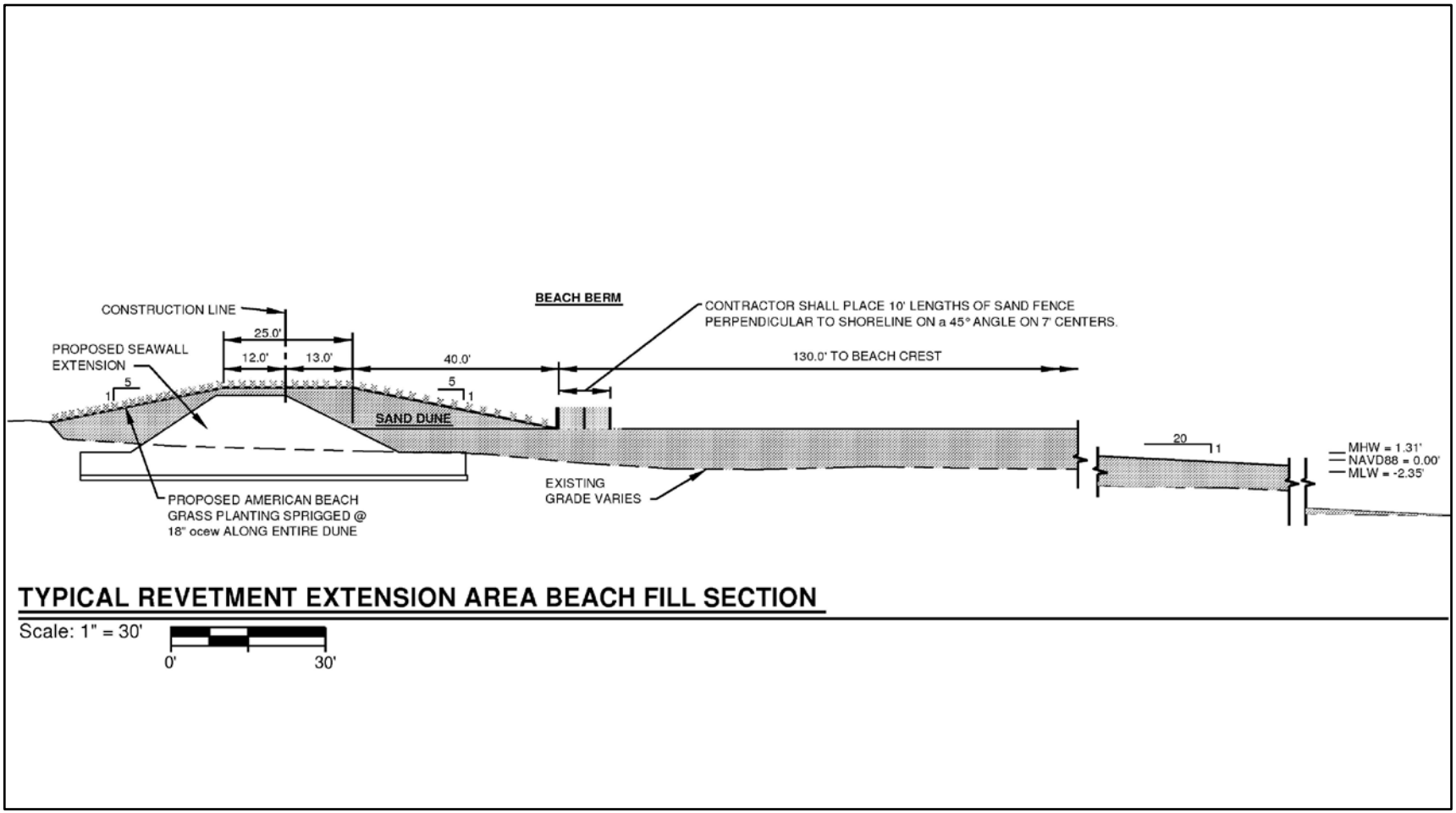


Figure 2-8: Typical Renourishment Design Template

Once the work is completed to its maximum distance in one direction, the onshore piping would be disassembled and relocated, and the work would move in the opposite direction employing the same technique. Once both directions have been completed, it is possible that the discharge line and pumpout station would be relocated along the beach to continue the work. Alternately, another dedicated discharge line and pumpout would already have been set up to be utilized immediately by the dredges to minimize down time. Similar to the mobilization phase, topographic and hydrographic surveys of the project site would continue to determine when project design requirements have been met.

It is expected that the dredging and beach fill work would take between 1.5-3 months to complete with actual duration driven by the number of hopper dredges the contractor would allocate to the project. The timing of the work would be dependent upon contractor availability, and therefore for the purposes of this EA, it should be assumed that the project could be conducted at any time of year between fall 2013 and summer 2014.

Due to the potential for avian and sea turtle use of the beach during the proposed project, if work were to be conducted between the months of April and September, NASA would ensure that the work site and adjacent areas are surveyed for nesting activity 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 (NASA 2011a). The biological monitor would coordinate directly with onsite project employees to ensure that all parties are made aware of potential nesting status and any need to suspend or relocate work activities until nesting activities have ceased.

2.3.4 Post-Dredging Activities

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 offsite. Additional remaining activities would include installation of sand fencing and planting dune grasses (Figure 2-9). It is NASA's intent to re-use as much of the existing sand fencing as possible. Therefore, the proposed project would include removing the existing sand fencing, stockpiling it until the beach fill is complete, and then re-installing it as needed. It is expected that a majority of the existing dune grass within the work site would be covered with sand, therefore requiring re-planting.

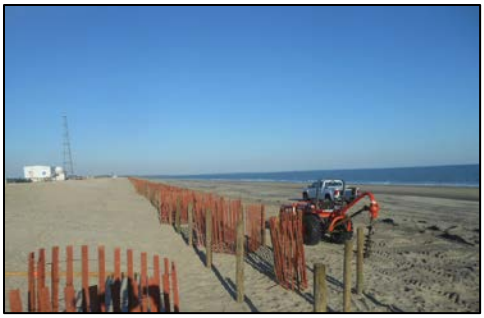


Figure 2-9: Installing Sand Fencing (left) and Planting Dune Grasses (right)

As described in detail in the *Final PEIS*, NASA and USACE would also resume the regular beach profile monitoring of the project site and immediately adjacent properties (i.e., Assateague Island, Assawoman Island) once beach fill activities have ceased.

2.3.5 Consideration of Sea Level Rise

Based upon the analysis presented in King et al. (2011), each renourishment cycle would include an additional volume of fill to compensate for sea level rise (SLR), estimated at project initiation to be approximately 11 mm per year based upon 85 percent of Curve 3 from NRC (1987) as adapted by Knuuti (2002). While SLR does not demonstrate linear growth, assuming a generally fixed increase can ease planning for future renourishment cycles. For example, in earlier years of the project (such as this proposed renourishment), the volume would outpace SLR, while in later years the volume would at least equal the expected SLR at year 50. In recognition of the variability in actual SLR rates over time, the volume can be adjusted accordingly in the future.

Since completing the *Final PEIS*, NASA has prepared additional estimates of climate change (and resultant sea level rise) for the WFF area using different methods (described in Horton et al. [2011]) than those employed by King et al. (2011). Based on local sea level records, scientists from NASA's Goddard Institute for Space Studies (GISS) developed two sets of SLR projections for WFF. The first, shown in light blue in Figure 2-10 below, regionalized the methods employed by the International Panel on Climate Change (IPCC) in 2007, relying heavily on Global Climate Models (GCMs). Because the models employed in the IPCC 2007-based approach may not fully capture land-based ice melt, a second rapid ice-melt (RIM) scenario (shown in darker blue) was also developed. Figure 2-10 indicates that the SLR estimates for WFF developed by King et al. (2011) are generally consistent with those prepared by GISS, ranging from approximately the 50th percentile of the RIM scenario earlier in the project, and ending at approximately the 25th percentile of RIM at year 50.

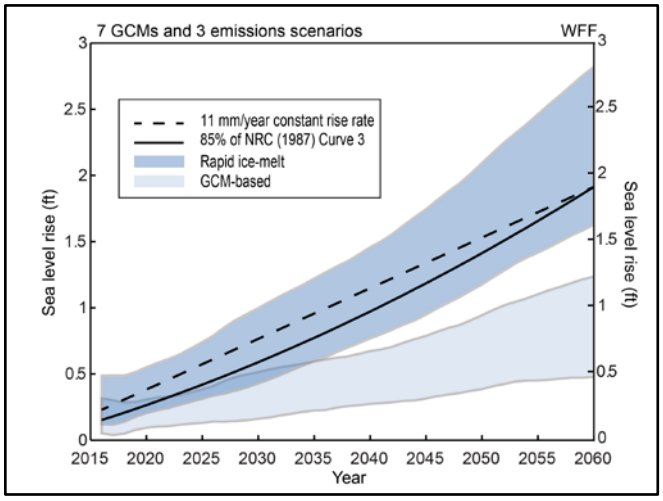


Figure 2-10: Comparison of SLR Estimates from King et al. (2011) (dashed black line) and GISS (2012) (blue shading)

It should be noted that the main usefulness of the SLR planning estimate initially developed for this project is to provide one of the component values needed to calculate the total volume of beach nourishment material needed over the project lifetime. It is not intended that this value actually be used at the time each renourishment occurs. Rather, the volumes needed at renourishment would be primarily based upon an analysis of the data collected from the on-site project monitoring program.

2.4 Summary of Proposed Action

In summary, with the exception of a shortened time (i.e., 2 years +/-) between initial fill and the first renourishment cycle, the Proposed Action is essentially equivalent to both the seawall extension/repair component and the renourishment component described in the *Final PEIS*, which estimated that approximately 806,000 CY of material would be needed approximately every 5 years.

The table below provides a summary of key information regarding the Proposed Action.

Table 2-1: Summary of Proposed Action

Key Information Regarding Proposed Action	
Cubic Yards of Material Placed	700,000 – 800,000
Cubic Yards of Material Dredged[1]	875,000 – 1,000,000
Mobilization Duration	30 - 45 days
Dredging and Beach Fill Duration	1.5 - 3 months
Demobilization and Post-Fill Activities	2 – 3 months
Source of Beach Fill Material	Unnamed Shoal A; Sub-Area A-1

[1]Assumes 25 percent difference between dredged volume and placed volume

3 Affected Environment and Environmental Consequences

NEPA requires a focused analysis of the resources potentially affected by an action or alternative. The results of the analysis should be presented in a comparative fashion that allows decision makers and the public to differentiate among the alternatives.

CEQ regulations for implementing NEPA also require the discussion of impacts in proportion to their significance, with only enough discussion of non-significant issues to show why more study is not warranted. The analysis in this EA considers the current conditions of the affected environment and compares those to conditions that might occur should NASA implement either of the alternatives.

Affected Environment

The affected environment for this EA includes the Wallops Island beach, the nearshore zone within which project related activities (i.e., dredge discharge) would occur, and the offshore shoal identified as the source of beach fill material.

Given that there is a complete description of all project-related resource areas in the 2010 *Final PEIS*, only those environmental resources that have measurably changed or would be notably affected are discussed in this EA; otherwise they are incorporated by reference.

Resources Carried Forward for Detailed Analysis

Table 3-1 presents the results of the process of identifying resources to be analyzed in this EA. The general organization of resource areas is consistent with the *Final PEIS*, however some have been grouped and/or renamed for clarity. For example, while the *Final PEIS* identified three separate resource areas of *Bathymetry*, *Geology and Geomorphology*, and *Physical Oceanography and Coastal Processes*, this EA combines them into a single resource entitled *Coastal Geology and Processes*.

Resources Considered but Eliminated from Detailed Analysis

Numerous resources were considered in the *Final PEIS*, but warrant no further examination in this EA because the *Final PEIS* concluded they would be negligibly affected. Those resources not warranting further discussion are also presented in Table 3-1.

Table 3-1: Resources Considered for Analysis in this EA

Resource	Analyzed in Detail in this EA?	If *Yes*, EA Section If *No*, Rationale for Elimination
Physical Environment: Section 3.1		
Coastal Geology & Processes	Yes	Section 3.1.1
Water Quality	Yes	Section 3.1.2
Floodplains	No	Negligible impacts identified in *Final PEIS*
Coastal Zone Management	Yes	Section 3.1.3
Air Quality & Climate Change	Yes	Section 3.1.4
Noise	Yes	Section 3.1.5
Hazardous Materials & Waste	No	Negligible impacts identified in *Final PEIS*
Biological Environment: Section 3.2		
Vegetation	No	Negligible impacts identified in *Final PEIS*
Benthos	Yes	Section 3.2.1
Wildlife	Yes	Section 3.2.2
Plankton	No	Negligible impacts identified in *Final PEIS*
Invertebrate Nekton	No	Negligible impacts identified in *Final PEIS*
Fisheries & Essential Fish Habitat	Yes	3.2.3
Marine Mammals	Yes	3.2.4
Threatened & Endangered Species	Yes	3.2.5
Social Environment: Section 3.3		
Land Use	No	Negligible impacts identified in *Final PEIS*
Infrastructure & Facilities	No	Negligible impacts identified in *Final PEIS*
Recreation	No	Negligible impacts identified in *Final PEIS*
Fisheries	No	Negligible impacts identified in *Final PEIS*
Population & Employment	No	Negligible impacts identified in *Final PEIS*
Health & Safety	No	Negligible impacts identified in *Final PEIS*
Environmental Justice	No	Negligible impacts identified in *Final PEIS*
Cultural Resources	Yes	Section 3.3.1

3.1 Physical Environment

3.1.1 Coastal Geology and Processes

3.1.1.1 Affected Environment

Sections 3.1.4 and 3.1.5 of the *Final PEIS* describe in detail the coastal processes influencing the project area. This section provides both a summary and updated information obtained since the *Final PEIS*.

Onshore and Nearshore

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.

In general, the net sediment transport along the Virginia barrier islands is from north to south. However, along much of Wallops Island, the direction of net longshore sediment transport is toward the north, due in most part to the growth (and resulting wave sheltering effects) of Fishing Point at the south end of Assateaugue Island (King et al. 2011). In addition to the northerly sediment transport, the westward drift of Chincoteague Inlet ebb shoals in the cross-shore direction is contributing to the rapid growth of north Wallops Island. This sediment accumulation is changing the existing north-south shoreline orientation to one that is much more east-west.

Of the Virginia barrier islands, Wallops Island is the only one that has been nourished. With the exception of Federally sponsored recreational beach parking area repairs on south Assateague Island, the others are managed for conservation purposes and are driven by natural forces. Prior to the initial beach nourishment in the spring and summer of 2012, sediment samples collected on Wallops Island in 2007 and 2009 indicated native median grain sizes ranging from approximately 0.18 millimeter (mm) to 0.27 mm, corresponding to fine sand per the American Society for Testing and Materials (ASTM) unified classification system.

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 mm and 0.54 mm, corresponding to fine to medium sand per ASTM. With the recent introduction of the coarser material, the intertidal and subaqueous portions of the Wallops Island shoreface are now steeper than they were pre-nourishment, especially in the area between 300-600 ft offshore of the rock seawall. However, due to the effects of Hurricane Sandy, the shoreface is now more gently sloped that it was immediately post-nourishment (Figure 3-1).

THIS PAGE INTENTIONALLY LEFT BLANK

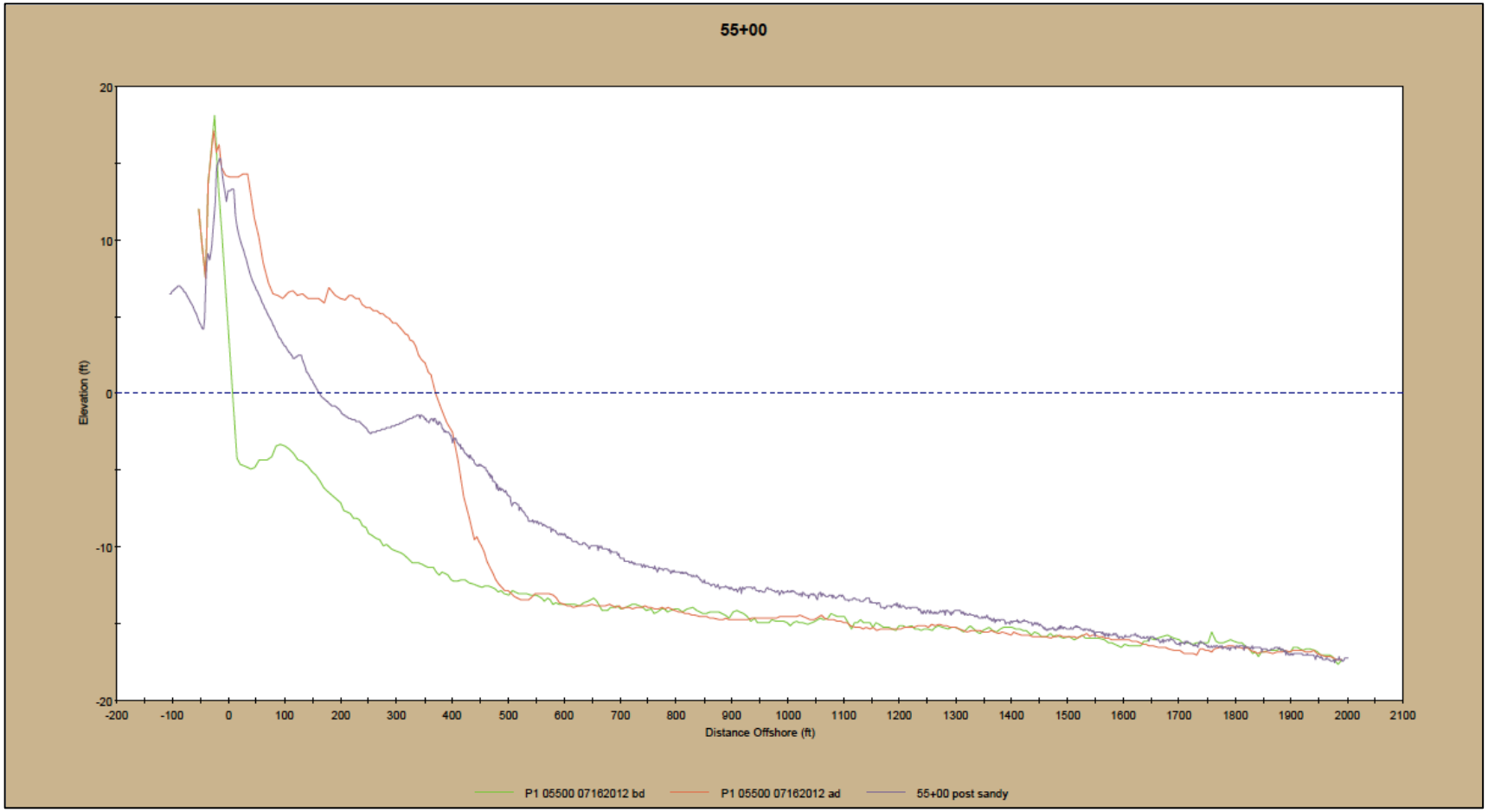


Figure 3-1: Beach Profile Changes at Pad 0-A; Vertical Exaggeration Approximately 28:1

Green line is before initial fill; brown line is after initial fill; purple line is Post-Sandy

Offshore

Unnamed Shoal A is an unvegetated offshore sand ridge located at the southern end of the Assateague ridge field. Of its approximately 1,800 acre (ac) surface area, up to approximately 515 ac of the shoal (sub-area A-1) were recently dredged for the initial beach fill cycle (Figure 3-2). In summary, the majority of the borrow area experienced changes in shoal elevation of less than 6 ft, and the material was removed in a generally uniform manner. As shown in Figure 3-3, the dredged area of the shoal now contains steeper, more pronounced areas of micro-topography than the relatively gently sloped area found prior to dredging.

A study by Dibajnia and Nairn (2011) identified 181 shoals between Delaware and Chesapeake Bays that were between the 33 ft and 130 ft depth contours and greater than 1.2 mi in length, all of which fit the general characteristics of Unnamed Shoal A. Assuming that these shoals are rectangular in shape, their surface area is estimated to be in excess of 590,000 ac. It should be noted, however, that this is only a first-order approximation; the referenced study only focuses on shoals deemed to be economically viable for dredging and excludes shoreface attached shoals, shorter shoals, and those in deeper waters. Accordingly, while Shoal A is an important geomorphic feature, it is only one of many shoals within a larger regional context of the Mid-Atlantic coast.

The limited sediment sampling effort conducted at the borrow area prior to the initial beach fill indicated that mean grain size was approximately 0.29 mm. However, as discussed above, additional sampling of the material indicates that it is generally coarser than originally expected.

3.1.1.2 Environmental Consequences

Sections 4.2.1 - 4.2.3 of the *Final PEIS* describe in detail the expected effects of dredging and beach renourishment on coastal processes. This section provides a summary.

No Action Alternative

Under the No Action Alternative, renourishment of the Wallops Island beach would not occur. It is expected that the northernmost area of the beach would continue to grow, with the remaining areas of the beach eroding at a level directly related to the frequency and intensity of future storm events. It is expected that some of the sediment moved offshore during Hurricane Sandy would return to the beach during times of calmer wave conditions (i.e., summer), however those areas of highest elevation (dune and berm) would not regain their pre-storm profiles. In the longer term, with the narrowing of most of the beach, it would be more likely for storm-driven overwash events to occur, moving sediment west of the beach.

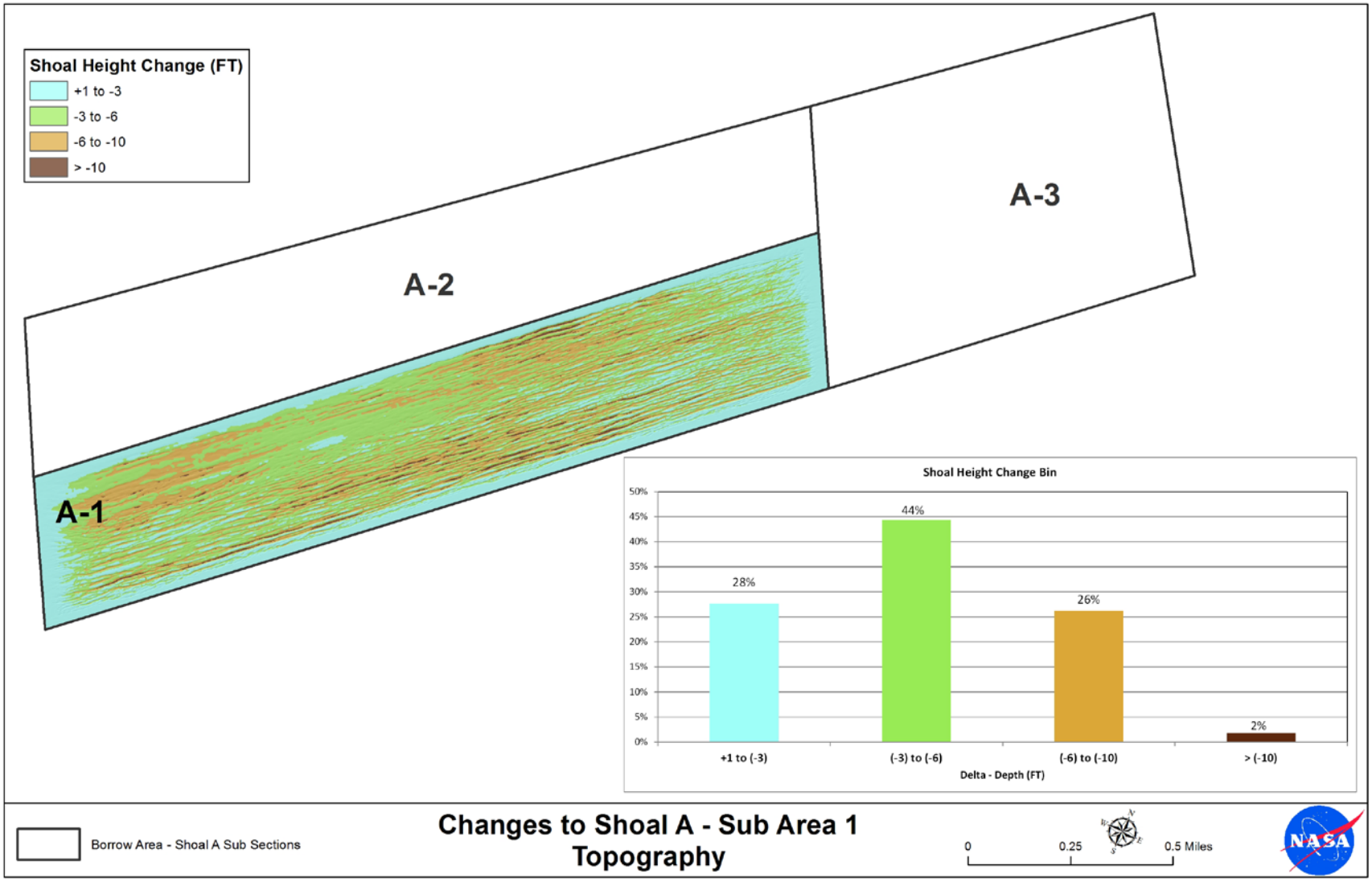


Figure 3-2: Summary of Changes to Borrow Area from Initial Beach Fill

Note that vertical error of each hydrographic survey (n=2) can be in excess of +/- 6 in

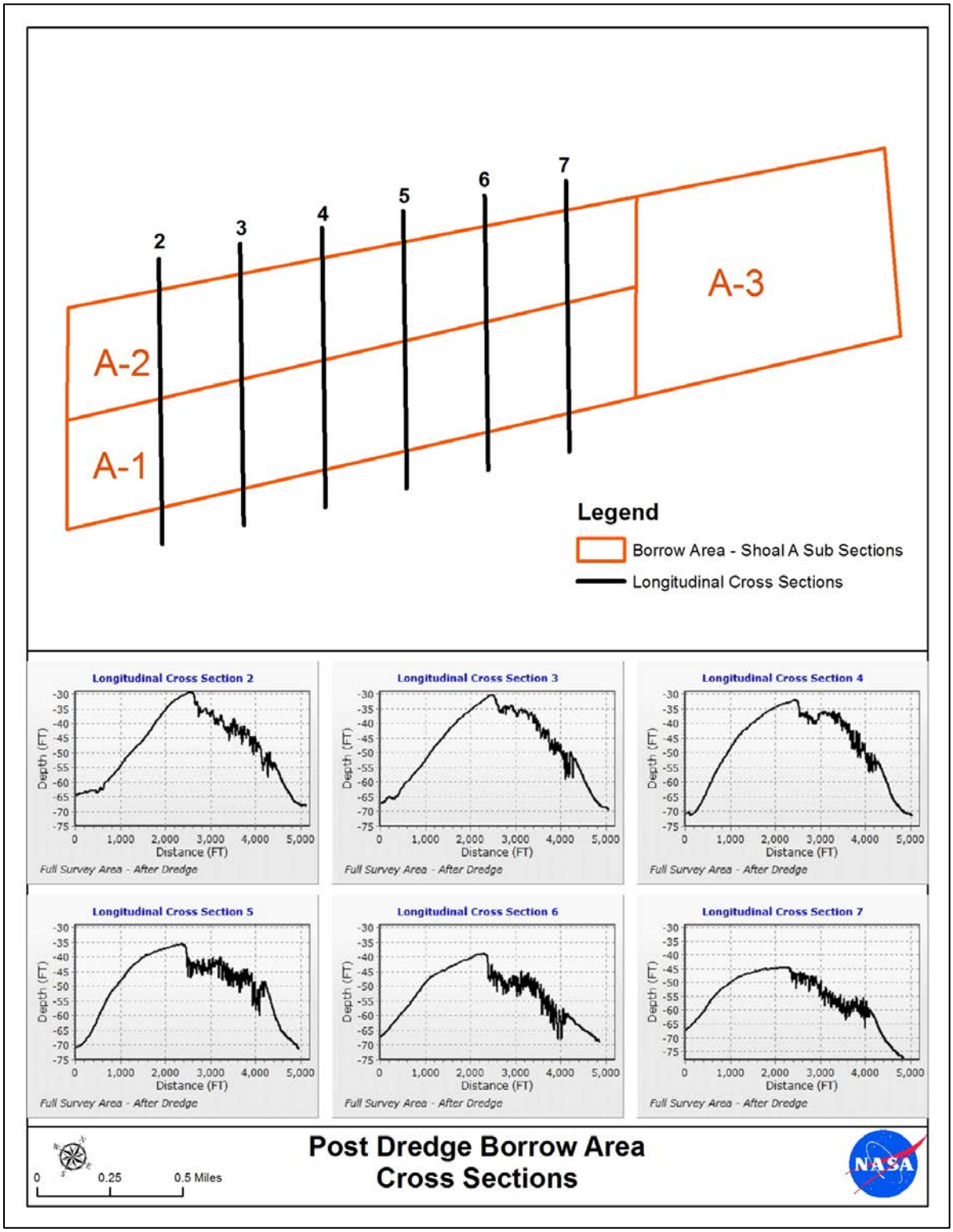


Figure 3-3: Selected Cross-Sections Depicting Changes to Borrow Area from Initial Fill Approximately 61x Vertical Exaggeration

At the borrow area, it is expected that on the decadal scale, wave and tidal energy would re-work the areas of micro-topography created by the initial dredging cycle, resulting in a more consistent, uniform elevation over time (Hitchcock et al. 1999). Changes in shoal volume and profile geometry would likely persist. While the accretional flank of the shoal crest is not expected to regain its pre-dredge elevation, it is expected that over time, the borrow area would equilibrate to the same general morphology, albeit at different profile and in places lower elevation (Dibajnia and Nairn 2011).

Proposed Action

Nearshore

Placement of the additional sediment along the Wallops Island shoreline would benefit the nearshore transport system because more material would be available for transport to either north Wallops Island or south to the adjacent Assawoman Island. It is expected that both areas would expand in size as a result. In the cross-shore direction, the presence of the elevated, more steeply sloped beach would limit the possibility of overwash events to only major storms, which would restrict Wallops Island from migrating to the west. In the easterly direction, the presence of additional sand within the nearshore system would likely lead to the formation of offshore sand bars, which would effectively dissipate wave energy.

Offshore

NASA would ensure to the extent practicable that material removal at the Shoal A borrow area would be done so in a uniform manner across the areal extent of sub-area A-1. As such, approximately two thirds of the southern half of the shoal's elevation would be lowered by an additional 1.5-3 ft on average, with some areas approaching an additional 10 ft below the current profile. While cut depths on the order of 5-10 ft would not be necessary over the entire borrow area to obtain the targeted fill volume, they could occur in some places due to the inherent limitations in precision associated with operating a dredge in the open ocean.

As proposed, the elevation of the northern portion of the shoal (sub-area A-2) would remain the same unless an unexpected condition (discussed in Section 2.3.3) required its use. The conservative model-based analysis performed for the *Final PEIS* indicated that even when a 2 square-mi area of the shoal was "planed" to an elevation necessary to obtain 10 million CY of material, the induced effects on the Assateague Island shoreline could not be distinguished from those changes occurring as a result of natural variation in sediment transport. Therefore, it is not expected that the additional lowering of the shoal would cause any measurable reduction in wave sheltering effects on properties to the west of the borrow area.

Dredging the borrow area would again create steeply sloped areas of micro-topography, which would be re-worked by tidal and wave energy in the years following the dredge event. Similar to the discussion under the No Action Alternative, 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.

3.1.2 Water Quality

3.1.2.1 Regulatory Context

Section 404 of the CWA established a permit program to regulate the discharge of fill material into waters of the U.S. Managed jointly by the USACE and the U.S. Environmental Protection Agency (EPA), the primary intent of the program is to minimize adverse effects to the aquatic environment. USACE is responsible for day-to-day administration and permit review while EPA provides program oversight. On March 10, 2011 USACE issued permit *NAO-1992-1455* for the initial fill cycle and 4,600-ft seawall extension. The permit's expiration date is February 28, 2016.

3.1.2.2 Affected Environment

Section 3.1.6 of the *Final PEIS* describes in detail the water resources within and adjacent to the project area. A summary is provided below.

Surface waters in the vicinity of Wallops Island are saline to brackish and are influenced by the tides. Marine waters in the project area maintain a fairly uniform salinity range (32 to 36 parts per thousand [ppt]) throughout the year, with pockets of high salinity water (38 ppt) found near the Gulf Stream in the fall (NASA 2003).

In the project area in winter, the water column is vertically well-mixed, whereas in the summer months, the offshore waters are vertically stratified, with notable differences in temperature between surface waters and those at greater depths. A 2009 benthic video survey of the borrow area showed bedforms on the shoal's surface, which is evidence that wave energy reaches the seafloor and mixing occurs throughout the water column.

3.1.2.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the proposed beach and seawall repairs would not occur. Therefore, there would be no project related impacts to water quality.

Proposed Action

Offshore

Dredging operations would cause sediment to be suspended in the water column. Studies of past projects indicate that the extent of the sediment plume is generally limited to between 1,640 – 4,000 ft from the dredge and that elevated turbidity levels are generally short-lived, on the order

of an hour or less. (USACE 1983; Hitchcock et al. 1999; MMS 1999; Anchor Environmental 2003; Wilber et al. 2006).

The length and shape of the plume depend on the hydrodynamics of the water column and the sediment grain size. Given that the dominant substrate at the borrow sites is sand, it is expected to settle rapidly and cause less turbidity and oxygen demand than finer-grained sediments. 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 hydrodynamics of the water column are subject to mixing and exchange with oxygen rich surface waters. Any resultant water column turbidity would be short term (i.e., present for approximately an hour) and would not be expected to extend more than several thousand feet from the dredging operation. Accordingly, it is anticipated that the project would have only minor impacts on marine waters at the offshore borrow area.

Nearshore

Multiple studies have been conducted on past beach nourishment projects to determine the extent and duration of elevated suspended solids levels downcurrent of a dredge's discharge pipe. In general, elevated concentrations were limited to within an area 1,310-1,640 ft of the discharge pipe in the swash zone (Schubel et al. 1978; Burlas et al. 2001; Wilber et al. 2006).

Given that the beach fill material proposed for the Wallops Island shoreline has a low amount of fine-grained sediment, it is expected that the turbidity plume generated at the placement site would be comparable to those reported in similar projects: concentrated within the swash zone, dissipating between 1,000-2,000 ft alongshore; and short term, only lasting several hours.

Both onshore and offshore construction equipment would use petroleum-based fuels and lubricants. Inadvertent spills or leaks of these substances would have the potential to adversely affect water quality. As such, NASA would require its contractors to implement Best Management Practices (BMPs) for vehicle and equipment fueling and maintenance as well as spill prevention and control measures.

Applicable Permit

NASA consulted with USACE to determine the applicability of its existing permit to the Proposed Action. On March 18, 2013, USACE responded that the Proposed Action would be permissible within the scope of the existing permit (see Appendix A). Subsequent to this correspondence, in a May 28, 2013 letter, NASA requested that USACE authorize an additional 1 ft of berm elevation for the proposed project design (see Appendix A). USACE's response is pending. NASA would only implement the proposed elevation change upon authorization from USACE.

3.1.3 Coastal Zone Management

3.1.3.1 Regulatory Context

The Virginia Department of Environmental Quality (VDEQ) is the lead agency for the Virginia Coastal Zone Management (CZM) Program. Any Federal agency development in Virginia's Coastal Management Area (CMA) must be consistent with the enforceable policies of the CZM Program. Although Federal lands are excluded from Virginia's CMA, any activity on Federal land that has reasonably foreseeable coastal effects must be consistent with the CZM Program. Because portions of the project are within Virginia's Coastal Zone and/or would have likely coastal effects, the Federal Consistency requirement applies.

Three enforceable policies of Virginia's CZM Program are particularly relevant to the Proposed Action. *Subaqueous Lands Management* and *Dunes Management*, both overseen by the Virginia Marine Resources Commission (VMRC), required NASA to obtain a permit from the agency prior to conducting the initial beach fill and seawall extension. Permit *10-2003*, issued on February 22, 2011, authorized the work with an expiration date of February 22, 2016. A third policy, *Wetlands Management*, administered by VDEQ, applied to the initial beach fill, however given that USACE and VMRC had already issued permits for the project, VDEQ waived its authority in a March 16, 2011 letter and no permit was issued.

3.1.3.2 Affected Environment

Section 3.1.8 of the *Final PEIS* describes in detail Virginia's CZM Program and its nine enforceable policies. NASA prepared a Federal Consistency Determination (FCD) in conjunction with the *Draft PEIS*; VDEQ concurred with NASA's determination in an April 14, 2010 letter. However, subsequent discussions with VDEQ indicate that a new FCD would be required for each beach renourishment cycle, including the Proposed Action.

3.1.3.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, there would be no impacts to the coastal zone.

Proposed Action

NASA determined that the Proposed Action would be consistent to the maximum extent practicable with the enforceable policies of the CZM Program. NASA submitted its FCD to VDEQ on March 8, 2013 (NASA 2013a). In a May 6, 2013 letter, VDEQ concurred with NASA's determination (see Appendix B).

Applicable Permits

NASA consulted with VMRC to determine the applicability of its existing permit to the Proposed Action. On January 13, 2013, VMRC responded that the Proposed Action would be permissible within the scope of the existing permit provided that the footprint or heights (elevations) of the project would not change (Appendix A). NASA also consulted with VDEQ regarding the applicability of its permitting waiver to the Proposed Action. In a May 20, 2013 email, VDEQ confirmed that the waiver would apply to the project (see Appendix A). Subsequent to these correspondences, in a May 28, 2013 letter, NASA requested that VMRC authorize an additional 1 ft of berm elevation for the proposed project design (see Appendix A). In a June 11, 2013 letter, VMRC authorized the requested design modification (see Appendix A).

3.1.4 Air Quality

3.1.4.1 Affected Environment

Section 3.1.9 of the *Final PEIS* describes in detail the regulatory context and types and quantities of air pollutants emitted from NASA's activities on Wallops Island. Below provides a summary.

Criteria Pollutants

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the Federal and State ambient air quality standards. The Clean Air Act (CAA), and its subsequent amendments, established the National Ambient Air Quality Standards (NAAQS) for seven "criteria" pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 (PM_{10}) and 2.5 ($PM_{2.5}$) microns in diameter, and lead (Pb). These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

Areas that exceed a Federal air quality standard are designated as non-attainment areas. Wallops Island is located in Accomack County, an attainment area for all criteria pollutants; therefore, a General Conformity Review (under Section 176(c) of the CAA) does not apply to this project.

Greenhouse Gases

Greenhouse Gases (GHGs) include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and several hydro- and chlorofluorocarbons. Each GHG is assigned a global warming potential (GWP), which is the ability to trap heat, and is standardized to CO_2, which has a GWP value of 1. For example, N_2O has a GWP of 310, meaning it has a global warming effect 310 times greater than CO_2 on an equal-mass basis. For simplification, total GHG emissions are often expressed as a CO_2e.

As GHGs are relatively stable in the atmosphere and are essentially uniformly mixed throughout the troposphere and stratosphere, the climatic impact of GHG emissions does not depend upon the source location. Therefore, regional climate impacts are likely a function of global emissions.

Until recently, GHGs have not been regulated under the CAA. Recent (2010) draft guidance from CEQ indicates that projects having estimated CO_2e emissions greater than 25,000 tonnes (27,500 tons) warrant further consideration.

3.1.4.2 Environmental Consequences

The primary emissions from the Proposed Action would result from the burning of fossil fuels in mobile sources (e.g., dredges, earth moving equipment, etc.). For the purposes of evaluating air quality impacts in this EA, emissions are considered to be minor if the Proposed Action would result in an increase of 250 tons per year or less for any criteria pollutant. The 250 tons per year value is used by the EPA in its New Source Review standards as an indicator for impact analysis for listed new major stationary sources in attainment areas. No similar regulatory thresholds are available for mobile source emissions. Lacking any mobile source emission regulatory thresholds, this threshold is used to equitably assess and compare mobile source emissions. For the assessment of greenhouse gases, the CEQ-recommended 25,000 tonnes (27,500 tons) threshold is applied.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, there would be no project related air emissions.

Proposed Action

In the *Final PEIS*, NASA estimated the potential criteria pollutant and GHG emissions from an 806,000 CY beach renourishment project that used Shoal A as the source of sand. As summarized in Table 3-2, while fossil fuel powered construction equipment would generate emissions; it is not anticipated to cause measurable long-term adverse impacts on air quality or climate change.

Table 3-2: Renourishment Cycle Criteria Pollutant and Greenhouse Gas Emissions

Source of Sand: Unnamed Shoal A	Tons per year					Metric tonnes per year			
	CO	NO_x	VOC	PM	SO_x	CO_2	N_2O	CH_4	CO_2e
TOTAL	**23.4**	**170.6**	**6.4**	**5.6**	**4.2**	**7,731**	**0.2**	**0.1**	**7,449**

3.1.5 Noise

Noise is defined as unwanted sound. Section 3.1.10 of the *Final PEIS* describes in detail the noise fundamentals and standards that are relevant to the Proposed Action. It is important to note that because air and water are two different media with different densities, different

reference sound pressure levels are used for each. The most commonly used reference for air is 20 microPascals (µPa) and the most commonly used reference for underwater is 1 µPa. Unless otherwise noted, all noise levels will be presented as such. Furthermore, under the Marine Mammal Protection Act (MMPA, discussed in Section 3.3.3 of this EA), root-mean-square (rms) levels are used to determine harassment, therefore all underwater sound levels will be reported in rms.

3.1.5.1 Affected Environment

This section focuses on new information obtained since the *Final PEIS*.

In-Air Sounds

NASA sponsored a study to characterize the ambient in-air sound levels on Wallops Island (BRRC 2011). Two of the study sites were on the Wallops Island beach; the northernmost site approximately 600 ft west of the surf zone in the Recreational beach area; the southernmost site was just south of the existing Unmanned Aerial Systems airstrip, approximately 300 ft from the surf zone.

The average daily background levels for the northernmost site ranged from 30 to almost 50 A-weighted decibels (dBA), with a constant level of low-frequency sound likely caused by the wind and surf. The site demonstrated an increase in sound levels during the daylight hours likely due to increased wind. The southern site also had the same general characteristics, however sound levels were higher, between 40 and 50 dBA, which was likely related to the closer proximity to the surf zone.

In-Water Sounds

During the initial beach fill in summer 2012, NASA partnered with BOEM and USACE to record background in-water sound levels at the both offshore borrow area and the nearshore pumpout area. Data were collected at two listening depths at each site; approximately 10 ft and 30 ft depths at the offshore shoal and 10 ft and 20 ft at the nearshore sites. During the study, the majority of data collected when winds were at least 4-7 miles per hour and wave heights were at least 1-2 feet. Therefore, the data do not reflect “calm” sea conditions.

Background sound pressure levels (SPLs) averaged 117 dB across all sampling days, sites, water depths and weather conditions. Minimum measured sound levels ranged from 91 dB to 107 dB depending on sampling location and water depth; maximum levels ranged from approximately 128 dB to just under 148 dB (Reine et al. *in prep*). Highest SPLs were found at frequencies of less than 200 hertz. The authors note that sea state and the associated sounds generated by waves interacting with the survey vessel likely contributed to the elevated readings.

3.1.5.2 Environmental Consequences

The primary focus of this section is to employ the new information summarized above to characterize the noise generated by the alternatives rather than to assess the effects on particular receptors. Given the distance of the borrow area from land, and that all placement activities would be conducted along the access-restricted Wallops Island shoreline (in contrast to a publicly-used beach), the sensitive receptors of concern would be wildlife, the potential noise-induced effects on which are discussed in this EA under *Wildlife*, *Marine Mammals*, and *Threatened and Endangered Species*.

No Action Alternative

Under the No Action Alternative, there would be no project related sources of noise. As such, the project site would continue to be dominated primarily by the sounds of wind and waves.

Proposed Action

In-Air Sounds

The operation of heavy equipment on the Wallops Island beach would be the most pronounced source of project-related sounds, including engine/radiator fans, back-up alarms, and connecting and moving onshore piping. Given the expected around-the-clock work schedule, it would be nearly constant for the 2-3 month duration of the project.

In general, construction noise levels at a particular receptor can be difficult to predict. Heavy construction vehicles, the major source of noise during construction projects, are constantly moving in unpredictable patterns, therefore no one receptor is expected to be exposed to construction noise of long duration. However, in the case of beach nourishment, it is expected that most of the noise-producing equipment would be located in approximately the same area on the beach (e.g., near the current location of the discharge pipe) and would move together in the same general direction.

Therefore, conservative estimates of “point source” sound levels can be determined using construction equipment sound level data collected by the Federal Highway Administration (FWHA) (2006). Assuming the immediate work site would include four bulldozers, a front-end loader, and two generators (one for office power, one for nighttime lighting), the total received sound level at 50 ft from the site would be approximately 90 dBA. Typically, sound drops off at a rate of 6 dB for each doubling of the distance from a point source (FHWA 2007). Employing this methodology, noise levels would fall within the upper range of background levels (50 dBA) at approximately 0.9 mi from the work site.

However, it should be noted that wind and surf conditions would play a major role in dictating the distances at which the construction related sounds could be heard by nearby receivers. Studies have shown that the effects of wind on sound propagation can be substantial, with

upwind attenuation approaching 25-30 dB more than downwind at the same distance from the source (Wiener and Keast 1959). Therefore, received construction-related noise levels would vary, however they would not be expected to be substantial.

In-Water Sounds

It is expected that in-water sound levels generated by the Proposed Action would be similar to those reported by Reine et al. (*in prep.)*, which summarizes recorded sound levels from hopper dredges operating in the nearshore waters off Wallops Island. Though the referenced study presents sound levels from three individual dredges, the sound levels presented for this analysis were logarithmically averaged into a single SPL for each activity in the dredging cycle.

Based upon data collected by Reine et al. (*in prep.*), sediment removal and the transition from transit to pump-out would be expected to produce the highest sound levels at an estimated source level (SL) of 172 dB at 3 ft. The two quietest dredging activities would be expected to be seawater pump-out (flushing pipes) and transiting (unloaded) to the borrow site, with expected SLs of approximately 159 and 163 dB at 3 ft, respectively.

These expected sound levels generally correlate with those presented in the *Final PEIS*, which were based upon levels recorded by Clarke et al. (2003). However the new information does suggest that SLs and the region of elevated sound around the dredges could be higher than originally anticipated, however not substantially different (discussed in more detail in Section 3.2.4 of this EA).

Based upon attenuation rates observed by Reine et al. (*in prep.)*, it would be expected that at distances approximately 1.6-1.9 mi from the source, underwater sounds generated by the dredges would attenuate to background levels. However, similar to in-air sounds, wind (and corresponding sea state) would play a major role in dictating the distance to which project-related underwater sounds would be above ambient levels and potentially audible to nearby receptors.

3.2 Biological Environment

3.2.1 Benthos

3.2.1.1 Affected Environment

Section 3.2.5 of the *Final PEIS* describes in detail the benthic (bottom dwelling) organisms that inhabit the project site. This section provides a summary.

Onshore

Air-breathing crustaceans such as ghost crabs dominate the uppermost zone of the Wallops Island beach, while the swash zone is dominated by isopods, amphipods, polychaetes, and mole crabs (*Emerita talpoida*). Below the mid-tide line is the surf zone where coquina clams (*Donax*

variabilis) and a variety of amphipods are prevalent. All such organisms are important prey species for a variety of waterbirds and fish.

Studies reviewed in preparing the *Final PEIS* indicated that filled beaches can be devoid of living benthos for up to a year following project completion. Given that the initial beach fill occurred less than one year ago, it is likely that the beach is still in a biologically suppressed state as compared to a natural beach. As the primary mechanism for recolonization of benthic organisms is transport from adjacent areas, it is expected that the northern and southern ends of the project site will recover first.

Offshore

Several recent studies conducted off the coasts of Delaware, Maryland, and Virginia have characterized nearby sand shoal habitats, finding that they are generally dominated by annelid worms, mollusks, and crustaceans.

Similar to the discussion regarding onshore benthic resources, it is not expected that the dredged area has fully recovered to pre-dredge conditions, however with a spring/summer recruitment pending, it is expected that the affected area will continue its biological recovery.

3.2.1.2 Environmental Consequences

Section 4.3.5 of the *Final PEIS* describes in detail the expected effects of dredging and beach nourishment on benthic organisms. This section provides both a summary and updated information obtained since the *Final PEIS*.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, there would be no adverse impacts to benthos. It is expected that an absence of newly placed sand would allow upper beach and swash zone benthic organisms to continue their recolonization of the areas affected by the prior year's initial fill cycle. Similarly, at the offshore borrow area; in the absence of additional dredging, the site would continue its biological recovery following the initial dredge event.

Proposed Action

Offshore

Within the borrow area, bottom dwelling organisms would be entrained in the dredge. Based upon reports by biological monitors onboard the dredges during the initial beach fill cycle, the most commonly encountered macrobenthos included horseshoe crab (*Limulus polyphemus*), whelk (*Busycon canaliculatum*), and blue crabs (*Callinectes sapidus*).

Because of the dynamic nature of benthic communities on the nearshore continental shelf and their variability over time, the recolonization and recovery of the dredged area can proceed at

various rates. A summary of post-dredge faunal recovery rates from 19 different projects in Europe and the U.S. compiled by Newell and Seiderer (2003) show a range from several weeks to more than ten years. The most rapid recovery rates were observed for muds and sands (i.e., several months up to two years); whereas the longest recovery periods (i.e., more than two years) were associated with gravel and reef habitats. Given that Unnamed Shoal A consists of fine to medium sand (per the ASTM unified classification), it can be estimated that the required benthic recovery time would be on the order of one year following cessation of dredging.

Nearshore and Onshore

Due to the handling and pumping activities, the dredged sand would likely be devoid of live benthos. As a result, the recovery of benthos at the placement area would rely on immigration of adult organisms from adjacent undisturbed areas, as well as larval colonization from the water column. However, raising the elevation of the existing beach from intertidal to upper beach would effectively limit the landward extent of water driven organismal transport. In the longer term, the re-establishment of an elevated beach berm would reduce the extent of the more biologically diverse intertidal zone.

Recovery time of benthos within the surf zone is expected to be more rapid than the offshore borrow area given the dynamic conditions within the nearshore and surf zones. Burlas et al. (2001) estimated that the recovery time for benthos in a New Jersey study ranged from approximately 2 to 6 months when there is a good match between the fill material and the natural beach sediment. In the case of the Proposed Action, the fill material would not be substantially different (though slightly coarser) than native material, therefore it is expected that recovery time would be similar to that reported in the referenced study.

Placement of beach fill and construction would also bury existing benthic communities and inhibit the ongoing recovery of the existing beach; however, the extent of the affected area would be limited and organisms from adjacent areas would recolonize the new beach in relatively short time (i.e., on the order of 6-12 months post-project).

3.2.2 Wildlife

3.2.2.1 Affected Environment

Section 3.2.2 of the *Final PEIS* describes in detail the terrestrial fauna that inhabit the project site. This section provides both a summary and updated information regarding wildlife activity on the Wallops Island beach since the *Final PEIS*. Those species listed for protection under the Federal Endangered Species Act (ESA) are discussed in Section 3.2.4 of this EA.

Onshore

Avifauna: The Wallops Island beach provides important nesting and foraging habitat for a number of migratory waterbirds, including gulls, terns, and sandpipers. Waterbird numbers on

the beach peak during the fall and spring migrations, during which the beach provides stopover habitat for resting and feeding as the birds transit between breeding and wintering grounds. Important food sources include fish and a wide variety of invertebrates, including mollusks, insects, worms, and crustaceans.

Given that the recently filled beach is expected to be mostly devoid of food sources, its habitat value is likely limited. However, with a spring/summer recruitment in the near future, it is expected that habitat value will continue to increase. Also noteworthy is that following the initial fill cycle, the northern end of the project site (which would be unaffected by the Proposed Action) has developed an expansive area of tidal pools, which are expected to be important sources of forage for avian species.

In accordance with its Protected Species Monitoring Program, NASA conducted regular monitoring of the Wallops Island beach between March and September 2012 to determine the level of avian nesting activity within and adjacent to the project area. During the monitoring period, one American oystercatcher (*Haematopus palliatus*) nest was identified outside the project area on north Wallops Island, however it was predated shortly after its discovery. In 2011, seven oystercatcher nests were found on Wallops Island. Of the seven nests, six were on the north end and one on the south end, west of the beach. At least five of the nests were unsuccessful due to either predation or storm overwash, with the remaining two enduring until the hatch window with unknown end results. No colonial waterbird nesting activity has been observed on the Wallops Island beach since NASA began its regular beach nesting bird surveys in spring 2010 (NASA 2012a).

Herpetofauna: Though Wallops Island is home to a number of amphibians and reptiles, the species most likely affected by activities on or adjacent to the beach is the diamondback terrapin (*Malaclemys terrapin*), which in the past has regularly nested on the north beach and locations west of the beach. However now that portions of the rock seawall have sand overtopping them, the species has easier access to the beach for its late spring to early summer nesting. During the recent beach fill, the species was observed frequently within the project site during the late May to early June timeframe.

Offshore

Seabirds including scoters, loons, and gannets utilize the offshore portion of the project area as foraging grounds during winter months. Similar to the discussion above regarding the nearshore environment, given that dredging occurred within the borrow area on Shoal A during spring and summer 2012, it is expected that the forage value of the affected area has not yet returned to pre-dredge conditions.

3.2.2.2 Environmental Consequences

Section 4.3.2 of the *Final PEIS* describes in detail the expected effects of dredging and beach nourishment on wildlife. This section provides both a summary and updated information obtained since the *Final PEIS*.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Within both the recently filled area of the Wallops Island beach and at the offshore borrow area, the biological recovery of these areas would continue, to the benefit of foraging avifauna.

In the absence of additional beach fill, the project site would continue to erode, resulting in a loss of suitable foraging and nesting habitat along most of the shoreline. As the beach narrows, it would increase the potential for the inundation of nests. It is expected that the north end of Wallops Island would continue to grow, to the benefit of beach nesting and foraging species.

Proposed Action

Onshore

Avifauna: Temporary noise and visual disturbances from construction equipment and personnel could adversely affect beach foraging and nesting birds. Direct effects could include eliciting a startle or flee response, which for foraging birds could temporarily interrupt feeding activities or cause individuals to relocate to other areas of the beach. If nesting birds were to flush from nests, it could lead to an elevated risk of egg overheating or predation. It would also be possible for equipment to inadvertently crush or bury nests or chicks if the nests were undetected. Adverse effects would also occur from a reduction in available food sources during and following the placement of sand on the Wallops Island shoreline. Due to the nesting cycle of potentially affected species, the possibility of adverse effects would be greatest should the work occur between the months of April and September.

However, onshore construction would occur well south of the areas of the beach that have historically hosted the greatest level of nesting activity. It is unknown to what extent the newly created Wallops Island beach will be used by waterbirds, as the beach has not yet been in place for a full nesting season. The actual usage patterns will play a large role in dictating potential impacts. For example, if nesting occurs well outside the areas of greatest human activity as it has in the past, species would be exposed to far fewer construction related stressors that could adversely affect their nesting success. However, the presence of the new beach could attract birds into areas where construction activities would occur, thereby increasing the probability for adverse interactions. Effects on prey availability are expected to be a contributing factor, and given that the beach is likely in a biologically suppressed state, it is possible that avian species would congregate closer to more forage-rich areas outside of the affected area. As discussed under *Benthos*, following the proposed renourishment, available forage would again be

suppressed, however the infauna and epifauna would be expected to recolonize the affected area within approximately 1 year.

Due to the uncertainty in potential avian use (and potential effects) during the proposed repairs, if work were to be conducted between the months of April and September, NASA would ensure that the work site and adjacent areas are surveyed for nesting by a biological monitor on a daily basis. The biological monitor would coordinate directly with onsite project employees to ensure that all parties are made aware of potential nesting status and any need to suspend or relocate work activities until nesting activities have ceased.

Long term, the renourished beach could create suitable waterbird nesting habitat. At a time when storm intensity and frequency are expected to increase, having an elevated, sparsely vegetated beach and dune along the entire length of Wallops Island is expected to be of notable benefit to all beach nesting species.

Herpetofauna: The primary concern regarding diamondback terrapin would be the potential to crush or bury an individual or its nest should beach fill occur within the early summer months. To mitigate this potential effect, NASA's biological monitor (discussed under *Avifauna*) would report any known areas of concentrated nesting to construction personnel such that they could be avoided until the turtles have moved from the immediate area.

Offshore

Dredging the offshore shoal by an estimated additional 1.5-3 ft on average (additional 10 ft maximum) would not substantially change shoal topography or impact the availability of seabird food sources as considered in the *Final PEIS*. Though the additional dredging would increase the water depths at the borrow area, diving species could still effectively forage on the shoal, however forage sources would be suppressed for several seasons following the work. All additional sand would be removed within areas already disturbed; therefore it would not expand the footprint of the area having reduced available forage following the dredge event. Both adjacent undisturbed areas on Shoal A and neighboring shoals (discussed in Section 3.1.1 of this EA) would provide adequate forage should seabirds avoid the directly affected area.

3.2.3 Fisheries & Essential Fish Habitat

3.2.3.1 Regulatory Context

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA), Federal agencies must consult with the National Marine Fisheries Service (NMFS) for activities that may adversely influence Essential Fish Habitat (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 discharge location are designated EFH for multiple life stages of managed fish species, therefore the EFH consultation requirement applies to the Proposed Action.

3.2.3.2 Affected Environment

Section 3.2.7 and 3.2.8 of the *Final PEIS* describes in detail the fisheries and EFH that occur within the project area. This section provides both a summary and updated information obtained since the *Final PEIS*.

Fisheries

The nearshore and offshore project site are home to a diverse mix of finfish including many of commercial and recreational value. In general, most fish encountered are within the site seasonally, migrating south or offshore as the waters cool in the fall and returning in the spring.

Essential Fish Habitat

The EFH Assessment prepared in conjunction with the *Final PEIS* (NASA 2010a) describes in detail all managed species and life stages that could occur within the project area. As such, the document is incorporated by reference in this section.

3.2.3.3 Environmental Consequences

Section 4.3.7 and 4.3.8 of the *Final PEIS* describe in detail the expected effects of dredging and beach nourishment on fisheries and EFH. This section provides both a summary and updated information obtained since the *Final PEIS*.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, there would be no project related effects on fisheries or EFH.

Proposed Action

Offshore

Fisheries: Entrainment in the dredge would be the most pronounced direct impact on finfish. On-dredge protected species observers from the spring/summer 2012 initial fill reported that the most common species entrained in the dredge were northern stargazer (*Astroscopus guttatus*), summer flounder (*Paralicthys dentatus*), clearnose skate (*Raja eglanteria*), and hake (species unspecified). Additionally, dredging would temporarily reduce and/or modify the benthic organisms and assemblages upon which finfish at higher trophic levels feed. Conversely, dredging could also attract fish due to the suspension of benthic prey species in the water column along with the suspended sediment.

Essential Fish Habitat: Dredging at the proposed borrow area would be conducted in a manner generally consistent with the recommendations made in two publications examining the dredging of offshore shoals in the mid-Atlantic (CSA International, Inc. et al. 2009 and Dibajnia and Nairn 2011). These recommendations include targeting depocenters for extraction, avoiding active

erosional areas, shallow dredging over large areas rather than deep pits, dredging shoals in less than 98 ft of water, and avoiding longitudinal dredging over the entire length of shoal.

Adverse effects within the dredged area would include removal and modification of benthic assemblages upon which managed species feed, modification of shoal topography, and an increase in water turbidity. 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. Recovery of shoal topography would be a longer process. While all affected areas on the shoal would not be expected to regain their pre-dredge elevation, it is expected that over time, the site would regain its same general morphology, although at lower elevation.

Nearshore

Fisheries: The most pronounced effect on finfish within the nearshore zone would be the burial of existing intertidal and subtidal habitat within which they would forage. Increased turbidity down current of the discharge pipe could also disrupt foraging behavior, however as discussed under *Water Quality*, the extent and duration of such effects would be very limited.

Essential Fish Habitat: 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 from a regional perspective the size of the area would not be substantial, and the area would return over time as the beach erodes.

To stabilize the dune area and reduce borrow requirements (and potential effects on EFH), NASA would plant the dunes with native vegetation and install sand fencing to trap windblown sand.

EFH Consultation

While preparing the *Final PEIS*, NASA consulted with NMFS Habitat Conservation Division (HCD) regarding effects of the project on EFH. In parallel with preparing this EA, NASA again consulted with NMFS HCD (NASA 2013b). In an April 24, 2013 letter, NMFS HCD offered three Conservation Recommendations (CRs) relating to dredging at the borrow area and stabilization of the beach and dune (see Appendix A). NASA accepted the three CRs in an April 29, 2013 letter (see Appendix A) and has incorporated them as integral components of the Proposed Action (see Sections 2.3.3 and 2.3.4 of this EA).

3.2.4 Marine Mammals

3.2.4.1 Regulatory Context

Under the MMPA, NMFS has defined noise-related levels of harassment for marine mammals. The current Level A (injury) threshold is 190 and 180 dB rms for pinnipeds (e.g., seals) and

cetaceans (e.g., bottlenose dolphin [*Tursiops truncates*]), respectively. The current Level B (disturbance) threshold for underwater impulse noise (e.g., pile driving) is 160 dB rms for cetaceans and pinnipeds. The Level B (disturbance) threshold for continuous noise (e.g., dredging) is 120 dB rms for cetaceans and pinnipeds.

3.2.4.2 Affected Environment

Section 3.2.9 of the *Final PEIS* describes in detail the marine mammals that may occur within the project area. This section provides a summary. Those federally listed species are discussed under *Threatened and Endangered Species* within Section 3.2.5 of this EA.

Of the approximately nineteen species of non-ESA listed marine mammals that could occur within or adjacent to the project area, the bottlenose dolphin would be the most common, and could be within the project site at any time of year. However, it would be most commonly encountered during the non-winter months. During winter, the species is rarely observed north of the North Carolina-Virginia border. Those individuals encountered would be expected to be the coastal morphotype; the offshore morphotype are primarily found farther offshore.

3.2.4.3 Environmental Consequences

Section 4.3.9 of the *Final PEIS* describe in detail the expected effects of dredging and beach nourishment on marine mammals. This section provides both a summary and updated information obtained since the *Final PEIS*.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, there would be no project related impacts to marine mammals.

Proposed Action

Potential adverse impacts to marine mammals would be associated with physical disturbance to habitats during dredging and fill, temporary increases in water turbidity, a reduction in prey availability, vessel strike, and increased noise from vessel activities. However, given the relatively slow speed of the dredge, the limited extent of habitat affected, and with the implementation of mitigation measures described below, effects are expected to be minimal.

As discussed in Section 3.1.5 of this EA, NASA participated in a study (Reine et al. *in prep.*) to better characterize dredge noise within its project site. As summarized in Table 3-3, in-water sounds levels associated with dredging would not reach the 190 and 180 dB rms thresholds; 160 dB rms would only be reached several meters from the dredge; and 120 dB rms would be reached at between 0.1 and 1.2 mi (0.2 and 1.9 km) from the dredge, depending on the specific activity within the dredging cycle.

When compared to the assessment of effects presented in the *Final PEIS*, the revised estimates of distances to the MMPA harassment thresholds are comparable to the original analysis with the exception of the 120 dB rms level for continuous noise. However, despite this approximately twofold increase in distance to the 120 dB rms threshold, it is expected that adverse effects could still be avoided with a modification to the observer protocol developed in consultation with NMFS for the initial fill cycle.

More specifically, NASA would ensure that an NMFS-approved bridge watch is stationed on each dredge at all times of year to scan the horizon for up to 1.2 mi (2 km) for marine mammals. At this distance, marine mammals could be readily detected with the aid of binoculars.

Table 3-3: Estimated Distances to NMFS Underwater Noise Thresholds[1]

Reference	Description	Received Level (dB)	Distance (m)	Trans. Loss (log R)	160 dB (m)	120 dB (m)	120 dB (km)
Final PEIS							
Clarke et al. (2003)	Hopper Dredge	140	40	15	2	862	0.9
New Information							
Reine et al. *(in prep.)*	Transit to Borrow Site	135	50	15.778	1	430	0.4
	Transition: Transit to Excavation	143	50	15.778	4	1,475	1.5
	Excavating Sediment	145	50	15.778	6	1,896	1.9
	Transition: Excavation to Transit	139	50	15.778	2	773	0.8
	Transit to Pump-out	143	50	15.778	4	1,439	1.4
	Transition: Transit to Pump-out	145	50	15.778	5	1,844	1.8
	Pump-out Water	132	50	15.778	1	308	0.3
	Pump-out Material	141	50	15.778	3	1,002	1.0
	Transition: Pump-out to Transit	129	50	15.778	1	182	0.2

[1]Distances presented in metric units for consistency with existing NMFS documents
To convert from meters to feet, multiply by 3.28; to convert kilometers to miles, multiply by 0.62

Should an individual be detected, the vessel would be required to turn off its pumps until the animal has left the immediate vicinity, upon which the dredging activity could resume. For the initial fill cycle, the distance to which observers were required to scan for species was approximately 0.6 mi (1 km).

In consideration of the above described mitigation measures, it would be highly unlikely that marine mammals within or adjacent to the project area would be subjected to noise levels in

excess of those prescribed by the MMPA. Therefore, the Proposed Action would not result in the harassment of any non-listed marine mammals. This conclusion is supported by the recent consultation with NMFS regarding the same issue as it applies to listed marine mammals, which is discussed in more detail in Section 3.2.5 of this EA.

3.2.5 Threatened & Endangered Species

3.2.5.1 Regulatory Context

Section 7 of the ESA requires Federal agencies to evaluate the effects of their actions on listed species and consult with either the USFWS or NMFS if the agency determines that its action "may affect" an individual or critical habitat of the respective species.

3.2.5.2 Affected Environment

Section 3.2.10 of the *Final PEIS* describes in detail the federally listed species that inhabit the project site. This section provides a both a summary and updated information obtained since the *Final PEIS*.

Onshore

A review of the Accomack County species list indicates that the species potentially within the project area have not changed from those discussed in the *Final PEIS*. In preparing the *Final PEIS*, NASA determined that project activities may affect the threatened seabeach amaranth (*Amaranthus pumilus*), threatened piping plover (*Charadrius melodus)*, candidate red knot (*Calidris canutus rufa*), and several species of nesting sea turtles, including loggerhead (*Caretta caretta)*, leatherback (*Dermochelys coriacea*), Kemp's ridley (*Lepidechelys kempii)*, and Atlantic green (*Chelonia mydas*). Although there is suitable seabeach amaranth habitat present on the Wallops Island beach, recent biological surveys have not identified any of these listed plants (NASA 2010c; 2011b; 2012a). Therefore, seabeach amaranth will not be discussed further, and this section will focus on piping plovers, red knots, and sea turtles.

Piping Plover: NASA conducted piping plover surveys 3-4 times weekly from March 2012 to September 2012, during which six nests were found on the recreational beach and north end of Wallops Island. All were outside of the area within which the beach was nourished. One nest had a 75 percent fledge rate with three of four chicks fledging, and the remaining five nests were unsuccessful either due to inundation during storms or predation (NASA 2012a). In 2011, prior to the initial beach fill, NASA undertook a similar monitoring protocol, during which three nests were found on Wallops Island. Two nests were on the north end and one on the south. One nest had a 0 percent fledge rate, the second had a 25 percent fledge rate, and the third had a 50 percent fledge rate (NASA 2011b).

Red Knot: During the month of May 2012, NASA observed flocks of red knots ranging in size from just under 10 individuals to more than 650. All observed birds were on the recreational beach and north end of Wallops Island as has been the case in previous years (NASA 2012a).

Sea Turtles: In 2012, NASA identified two loggerhead sea turtle nests, the first of which was located in June within the Recreational Beach area and was ultimately predated. In early July, two false crawls on different days led to a nest on the crest of the newly constructed dune just east of Navy Building V-10. After the closure of the hatch window, the nest was excavated under observation from the USFWS and five live hatchlings were discovered and subsequently released to the ocean. One hundred hatched eggs shells were counted resulting in a 78% success rate, which is high (NASA 2012a). No marine sea turtle activity was identified on Wallops Island during the 2011 season (NASA 2011b).

Offshore

In preparing the *Final PEIS*, NASA determined that project activities may affect in-water sea turtles (species listed above under *Onshore*) and several whale species, including right (*Eubalaena glacialis)*, fin (*Balaeanoptera physalus*), sperm (*Physeter macrocephalus)*, sei (*Balaenoptera borealis)*, and blue (*Balaenoptera musculus*). Of note is the recent listing of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*, which could be affected by project activities. Though Atlantic sturgeon was not discussed in the *Final PEIS*, NASA prepared a Supplemental Biological Assessment (2011c) that provides a detailed description of the species. It is incorporated by reference into this section. During the initial beach fill cycle, no sightings of either listed in-water species were reported by observers onboard each of the three dredges.

3.2.5.3 Environmental Consequences

Section 4.3.10 of the *Final PEIS* describes in detail the expected effects of dredging and beach nourishment on listed species. In conjunction with the preparation of the *Final PEIS*, NMFS (2012) and USFWS (2010) each issued NASA a Biological Opinion (BO) addressing the effects of its 50-year design life shoreline restoration program. This section provides both a summary and updated information obtained since the *Final PEIS*.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, there would be no direct impact to listed species. However, the recently nourished beach would continue its biological recovery and its forage value to avian species would increase. Conversely, as the beach erodes, it is expected to provide less available nesting habitat for piping plovers and sea turtles. As the beach berm is lowered, the remaining habitat would be more susceptible to storm-induced flooding and washout of nests.

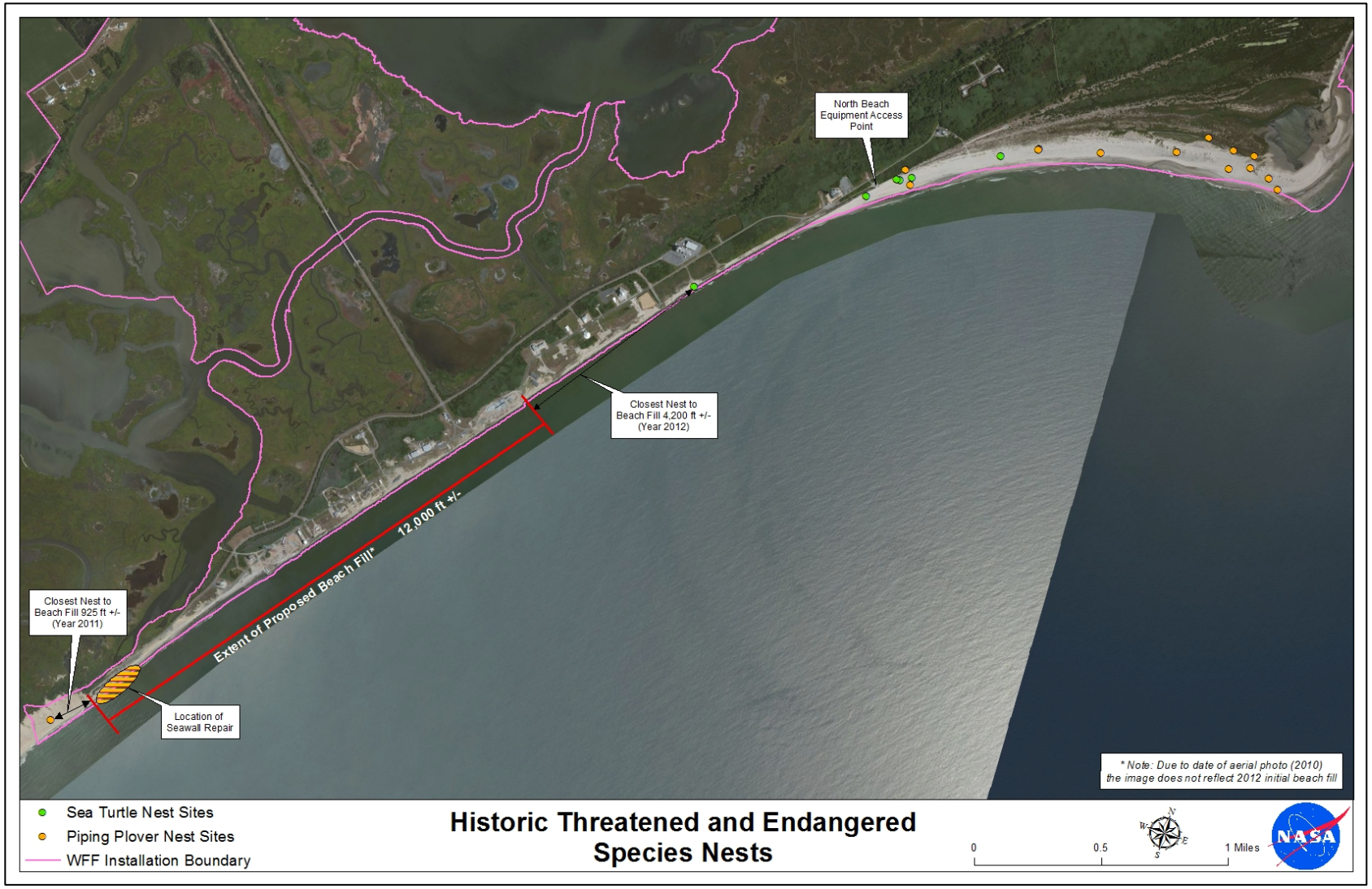


Figure 3-4: Recent (2010-2012) Listed Species Nests in Relation to Proposed Action

Proposed Action

Avifauna: Impacts on piping plover and red knot would be generally the same as those discussed for non-listed avian species in Section 3.2.2.2 of this EA. In summary, these effects would include the potential for startle or disruption of foraging, reduction in prey availability, and for plovers, the potential for disruption of courtship and nesting activities. However, the majority of both plover and red knot activity on Wallops Island has historically occurred on the north end of the island, well outside of where work would occur under the Proposed Action (Figure 3-4). The potential exists for plover nesting activity to occur within the proposed project site, and accordingly, NASA would employ a biological monitor to survey the project site on a daily basis should work occur between the months of April and September.

Herpetofauna: Impacts to nesting sea turtles could include avoided nesting attempts due to nighttime construction activity (particularly artificial lighting) on the beach, unintentional burial of a newly dug nest if it were to go undetected, disorientation of hatchlings (due to project-related light sources), or obstruction to hatchlings during their emergence and subsequent trip to the ocean.

In the long term, it is possible that the replenished beach could prove unsuitable to nesting turtles due to a number of physical factors, including sand grain size, color, level of compaction, and scarping, which could impede access to the dry portion of the beach. However, given that the beach fill material is not substantially different from nearby native beaches, it is not expected that such effects would be major. Moreover, as evidenced by the sea turtle nesting that occurred on the Wallops Island beach during the initial beach fill cycle (Figure 3-4), it is possible that the additional elevated beach would provide suitable nesting habitat, a net benefit to the species.

Effects on in-water sea turtles could include entrainment in the dredge, interaction with the sediment plume, reduction in available forage, and disturbance due to vessel created sounds. However, given the limited number of sea turtles expected to use the borrow area as habitat and the limited portion of available habitat affected, the potential for interaction is limited. This conclusion is supported by the recently completed initial beach fill cycle, conducted during the months of April and August. Protected species observers stationed onboard each of the three dredges evaluated every load and did not document a sea turtle entrainment.

Atlantic Sturgeon: Effects on sturgeon would be similar to those of in-water sea turtles and could include entrainment in the dredge, interaction with the sediment plume, reduction in available forage, and disturbance due to vessel created sounds. However, given the limited number of sturgeon expected to use the borrow area as habitat and the limited portion of available habitat that would be affected, the potential for interaction is limited. Similar to in-water sea turtles, this conclusion is supported by the recently completed initial beach fill

cycle. Endangered species observers stationed onboard each of the three dredges evaluated every load and did not observe an entrained sturgeon.

Cetaceans: Similar to the discussion of impacts on non-listed marine mammals, potential effects could include ship strike, loss of habitat and prey species, interaction with the sediment plume, and exposure to elevated sound levels, which could interrupt normal behaviors, including foraging, migrating, or communicating. The likelihood of interaction with a listed whale would likely occur between November and April. However, the project is not a concentration area, rather the site is expected to be only a migratory corridor, therefore numbers in the area would be low. To mitigate potential effects on listed marine mammals, NASA would ensure that the dredge contractor followed the updated mitigation measures summarized in Section 3.2.4.3 of this EA as well as those described in detail in the NMFS BO (summarized below).

Section 7 Consultations

NMFS: NASA consulted with NMFS regarding the Proposed Action and the new information regarding dredge noise (NASA 2013c). On March 21, 2013, NMFS responded that the scope of the Proposed Action would be within that already considered in its August 3, 2012 BO and that the new information did not warrant re-initiation of formal ESA consultation (see Appendix A).

USFWS: NASA consulted with USFWS regarding the effects of the Proposed Action on piping plover and nesting sea turtles (NASA 2013d). On March 20, 2013, USFWS responded that the scope of the Proposed Action would be within that already considered in its July 30, 2010 programmatic BO (see Appendix A).

In developing the BOs, NMFS and USFWS provided mandatory terms and conditions that NASA must follow to reduce potential effects to listed species. As such, NASA and USACE would ensure that their contractors implemented these measures on their behalf.

3.3 Social Environment

3.3.1 Cultural Resources

3.3.1.1 Regulatory Context

The National Historic Preservation Act (NHPA) of 1966, as amended, outlines Federal policy to protect historic properties and promote historic preservation in cooperation with other nations, Tribal governments, States, and local governments.

Section 106 of the NHPA and its implementing regulations outline the procedures for Federal agencies to follow to take into account their actions on historic properties. Under Section 106, Federal agencies are responsible for identifying historic properties within the Area of Potential Effects for an undertaking, assessing the effects of the undertaking on those historic properties, if present, and considering ways to avoid, minimize, and mitigate any adverse effects.

3.3.1.2 Affected Environment

Section 3.2.10 of the *Final PEIS* describes in detail the cultural resources that may occur within or adjacent to the project site.

While preparing the *Final PEIS*, NASA sponsored remote sensing surveys of the borrow area. Additionally, prior to conducting the initial beach fill, NASA's dredge contractor surveyed the nearshore zone for submerged cultural resources prior to anchoring its dredge pumpout buoys. No archaeological (below ground or underwater) resources or aboveground historic properties were identified within the project area.

3.3.1.3 Environmental Consequences

Section 4.4.8 of the *Final PEIS* describe in detail the expected effects of dredging and beach nourishment on cultural resources. This section provides both a summary and updated information obtained since the *Final PEIS*.

No Action Alternative

Under the No Action Alternative, the proposed repairs to the beach and seawall would not occur. Therefore, cultural resources would not be impacted.

Proposed Action

All dredging and sand placement would be conducted within areas previously surveyed for cultural resources. Given the lack of potential resources identified during the surveys, no archeological resources or aboveground historic properties would be impacted. However, if unanticipated archaeological artifacts or remains are identified during the project, the contractor would be required to halt work and immediately contact the WFF Historic Preservation Officer, who would consult with the VDHR to 1) determine the significance of the resource; 2) evaluate the effects of the undertaking on the resource; and 3) identify the appropriate avoidance or mitigation measures.

Section 106 Consultation

While preparing the *Final PEIS*, NASA consulted with the VDHR and BOEM; both agencies concurred with NASA that seawall extension, sand retention structure construction, dredging, and beach fill would not have an adverse effect on historic properties.

However, there remained uncertainty as to where the dredge contractor would locate nearshore pumpout stations, some of which could entail anchoring and related seafloor disturbance. Given this uncertainty, NASA and VDHR agreed that remote sensing surveys of proposed pumpout locations would be performed as a term of the dredge contract prior to their establishment. Any anomalies identified by the surveys would be avoided.

Consistent with the agreement, NASA's dredge contractor conducted additional remote sensing surveys of the nearshore pumpout areas, which NASA provided to VDHR. On April 2, 2012, VDHR concurred that no additional survey effort would be needed.

In parallel with preparing this EA, NASA again consulted with VDHR to ensure that the protocol employed for the initial fill cycle would be appropriate for the proposed repairs (NASA 2013e). On March 20, 2013, VDHR concurred with NASA that the protocol would be appropriate and with its implementation the Proposed Action would have no effect on historic properties (see Appendix A).

3.4 Cumulative Effects

The CEQ defines cumulative effects as the "impact on the environment which results from the incremental impact of the action(s) when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

Section 4.7 of the *Final PEIS* provides a detailed Cumulative Effects Analysis (CEA) for all potentially affected resource areas throughout the 50-year design life of the shoreline restoration program, including effects of past actions dating to Federal settlement of Wallops Island in the early 1940s. That analysis is incorporated by reference with the focus of this CEA being the timeframe immediately prior to the initial beach fill (i.e., 2012) up until 5 years into the future (i.e., 2018), which is the general timeframe expected for when the next renourishment would be necessary, and when another tiered NEPA document (with corresponding CEA) would be prepared to support the decision-making process.

3.4.1 Resources Evaluated

Following CEQ's 1997 guidance, the scope of the CEA should be related to the magnitude of the environmental impacts of the proposed action. Proposed actions of limited scope and impact typically do not require as comprehensive a CEA as proposed actions that have environmental impacts over a large area.

Therefore, similar to the methodology employed for deciding those resources to be considered in detail in the "direct and indirect effects" section of this EA, only those resource areas upon which the Proposed Action would cause measurable effects are considered in detail in this CEA. Table 3-4 provides a summary of those resources considered and whether they were included for detailed analysis in this CEA.

3.4.2 Actions Included

Sections 3.4.2.1 – 3.4.2.6 below describe the actions that NASA included in this CEA. It should be noted that NASA is currently preparing a twenty-year planning horizon "master plan" *Site-wide PEIS*, and accordingly it considered the relevance of those actions to this CEA.

Table 3-4: Resources Considered for Cumulative Effects
Only Those Analyzed in Detail in this EA are Shown

Resource	Analyzed in Detail in this CEA?	If *Yes*, EA Section If *No*, Rationale for Elimination
Physical Environment		
Coastal Geology & Processes	Yes	3.4.3.1
Water Quality	No	Negligible impacts identified in this EA
Coastal Zone Management	No	Negligible impacts identified in this EA
Air Quality & Climate Change	No	Negligible impacts identified in this EA
Noise	No	Negligible impacts identified in this EA
Biological Environment		
Benthos	Yes	3.4.3.2
Wildlife	Yes	3.4.3.3
Fisheries & Essential Fish Habitat	Yes	3.4.3.4
Marine Mammals	No	Negligible impacts identified in this EA
Threatened & Endangered Species	Yes	3.4.3.5
Social Environment		
Cultural Resources	No	Negligible impacts identified in this EA

However, it was determined that those actions possibly presenting additive impacts to resources affected by the Proposed Action either would not overlap temporally (i.e., they would occur well into the future) or are not well defined enough to be considered reasonably foreseeable for inclusion in this CEA.

3.4.2.1 Wallops Island Initial Beach Fill and Seawall Extension

Between April and August 2012, USACE (on NASA's behalf) contracted the placement of approximately 3.2 million CY of sand along approximately 3.7 mi of the Wallops Island shoreline. Nearly the entire area 100-200 ft east of the existing rock seawall was converted from open water to an elevated beach and dune. Additionally, the seawall was extended approximately 1,415 ft south.

3.4.2.2 Wallops Island Range Activities

NASA can currently launch up to 108 rockets a year from the pads on Wallops Island. These include a maximum of 60 from the Sounding Rockets Program, 12 from orbital rocket missions

at Pad 0-B, 6 from orbital rocket missions at Pad 0-A, and 30 from Navy missiles and drones (NASA 2005; NASA 2009). However, the current expected launch tempo within the analysis period is approximately 10-15 sounding rockets and 4-6 orbital launches per year. NASA also conducts unmanned aerial system (UAS) flights from the existing airstrip on south Wallops Island.

In support of its launch range, NASA recently proposed to establish a protocol for enabling the temporary landing of its UH-1 surveillance helicopter on North Wallops Island to provide rapid safety surveillance of Chincoteague Inlet and Atlantic Ocean during rocket launches. During launch countdowns, NASA utilizes its helicopter and crew to monitor boat traffic and to either escort encroaching vessels or to notify the Coast Guard that further action is required to ensure safety.

3.4.2.3 North Wallops Island Unmanned Aerial Systems Airstrip

In March 2013, NASA obtained permits for the construction of an approximately 2,600-ft-long UAS airstrip on north Wallops Island. Funding has not yet been secured, however NASA intends to construct the project as soon as practicable. While the footprint of construction would be well outside the areas frequented by resources potentially impacted by the Proposed Action (e.g., beach nesting birds), the project would enable routine overflight of the Wallops Island beach during either approach or departure. The expected level of activity from the new airstrip is not expected to exceed 1,044 sorties (flights) per year (NASA 2012b).

3.4.2.4 Installation and Operation of a U.S. Navy Powder Gun and Railgun

The Naval Surface Warfare Center Dahlgren Division (NSWCDD) has proposed to install and operate a 5”/62 powder gun and electromagnetic railgun on Wallops Island beginning in 2014. This research, development, test, and evaluation project would begin with the installation of a 5”/62 powder gun that fires the same projectiles as the railgun. The preferred installation site is Pad 5, located mid-island east of Navy building V-3. The original plan was to fire approximately 100 inert test rounds from the powder gun in 2014; however the number of rounds would likely be reduced due to budget and schedule issues. Installation of the railgun is expected to follow in 2015 and railgun testing is expected to continue through 2019. The railgun is projected to fire a combination of mostly inert rounds with a small percentage of live warheads. The live warheads would have a net explosive weight of less than approximately 2 pounds each. NSWCDD, in cooperation with NASA WFF, is preparing an EA to evaluate the environmental consequences of the powder gun and railgun activities at Wallops Island.

3.4.2.5 Wallops Island Beach Motorized Uses

The WFF security office performs daily vehicle patrols of the Wallops Island beach. All patrols follow a defined protocol, which mandates that the same points of access are used, and that unless emergency conditions dictate, all vehicles are operated within the intertidal zone.

In addition, a portion of the north Wallops Island beach is open to WFF employees for recreational use. The extent of the open area is modified based upon the time of year, with winter months the least restrictive and non-winter months the most restrictive to protect nesting piping plovers and sea turtles. Launch range safety regulations mandate that all areas south of the northern terminus of the rock seawall are closed to recreation, regardless of time of year.

3.4.2.6 Wallops Island Predator Management

On NASA's behalf, the U.S. Department of Agriculture Wildlife Services staff performs regular predator removal on Wallops Island to reduce the potential for the depredation of eggs or young of beach nesting species (e.g., turtles, shorebirds). Efforts focus primarily on the management of raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), laughing gull (*Larus atricilla*), herring gull (*Larus argentatus*), great black-backed gull (*Larus marinas*), fish crow (*Corvus ossifragus*), American crow (*Corvus brachyrhynchos*), and common grackle (*Quiscalus quiscula*). Activities are conducted year round as needed with more effort being spent during the winter, spring, and early summer months. These times are most important due to mammalian predator dispersal, bird breeding, and nesting times.

3.4.2.7 Wallops Island Protected Species Monitoring

As a component of its Natural Resources Management Program at WFF, NASA regularly surveys the Wallops Island beach for piping plover and sea turtle activity between the months of March and September. Any nests discovered are marked with a global positioning unit and identified with signage. In addition to the regular field survey, program staff also provide outreach to all users of the beach, including security staff and recreational users. Elements of the outreach program include maintenance of signage at all beach access points and development and dissemination of fact sheets, both of which contain information regarding the listed species that may be on the beach and the appropriate reporting protocol if the presence of a species is suspected.

3.4.3 Potential Cumulative Effects

Below is a discussion of the potential cumulative effects for each resource area that would be measurably impacted by the Proposed Action.

3.4.3.1 Coastal Geology and Processes

In combination with the Wallops Island initial fill cycle, the cumulative effect of the Proposed Action would be the introduction of a total of approximately 4,000,000 CY of sediment within the nearshore zone over a 2.5-year period. In consideration of the general trends of sediment movement within the analysis area, it is expected that a majority of the material would move toward the north end of Wallops Island, therefore contributing to its continued growth. In the cross-shore direction, it is expected that the introduction of fill material would result in the formation of more offshore bars.

At the offshore borrow area, the additional dredging under the Proposed Action would have the additive effect of reducing the elevation of sub-area A-1 by a total of 5-10 ft on average, with some areas lowered by up to 20 ft in total. However, as discussed in Section 3.1.1.2 of this EA, the physical process modeling performed for the *Final PEIS* simulated an even greater lowering of the shoal, with the results indicating that removing the entire 50-year program's sand volume (approximately 10 million CY) at one time would not have notable effects on the wave sheltering properties of the subject shoal. Therefore, it can be concluded that the combination of dredging from the initial beach fill and the Proposed Action would not measurably affect the sediment transport processes on properties to the west of the borrow area.

3.4.3.2 Benthos

When considered collectively with the initial beach fill, the proposed renourishment would further delay the recovery of the offshore and nearshore benthic communities affected by the project, however the duration would be relatively short (on the order of several seasons) and spatial extent limited to a smaller area that that was impacted by the initial beach fill.

3.4.3.3 Wildlife

The focus of this section is avian resources, as the Proposed Action would most measurably affect them. When considered in conjunction with the Proposed Action, noise and lighting from launch range activities and the powder gun/railgun firings could produce additive effects on beach dwelling birds. The most likely effect would be the elicitation of a startle or flee response, which would interrupt foraging and nesting activities. Effects would be most pronounced during the spring and summer months, when nesting would occur. Given the additive reduction in available forage (discussed in more detail below) and cumulative presence of anthropogenic sources of sound and light in areas further south, it is possible that most avian activity would remain on the north Wallops Island beach.

In general, given its distance from the launch facilities on south Wallops Island, north Wallops Island is not measurably affected by noise from most range activity with the exception of the proposed helicopter surveillance activities and future UAS overflights from the north airstrip. However, NASA would maintain at least a 1,000 ft buffer from identified shorebird nests to reduce the potential for impacts. This buffer requirement has been applied historically at the south UAS airstrip and was established for the future use of the north airstrip to reduce potential startle effects. Moreover, NASA is currently consulting with USFWS on the helicopter landings due to potential effects on piping plovers and would only conduct such landings during shorebird nesting season following the completion of the consultation.

If, during beach reconstruction, avian species relocated north to the recreational beach outside the project site, cumulative effects on nesting shorebirds could also occur from motorized uses on the Wallops Island beach. If unmanaged, motorized vehicle use on beaches can be a threat to beach nesting birds due to the potential for disturbance or mortality of adults, nests, and

fledglings. However, with the continued implementation of the protected species monitoring program on the Wallops Island beach, it is expected that nests would be identified shortly after establishment and marked with signage. Site-specific measures, particularly the relocation of recreational activities to areas without nesting activity, could further mitigate any potential effects. Additionally, as vehicular use of the Wallops beach is relatively low, and is limited to WFF employees (who receive protected species awareness training), these effects are not expected to be substantial.

Consistent with the discussion above under *Benthos*, additional dredging and sand placement would essentially "reset" the infaunal recovery that is taking place at the project site following the initial fill cycle, and would have an adverse effect on beach foraging birds, which rely upon organisms in the intertidal zone for sustenance. In general, given that the initial beach fill occurred during the summer months, the additive effect would be the most pronounced if the Proposed Action were to occur in summer. However, given that the extent of the proposed renourishment would not extend beyond the areas previously affected, and along the shoreline the linear extent of the affected area would be approximately 40 percent less, it is expected that beach foraging birds could find necessary food resources within adjacent areas.

One of the greatest threats to nesting shorebirds is predation. To reduce the risks of predation to nesting shorebirds and sea turtles on the Wallops Island beach, WFF employs biologists from USDA Wildlife Services who routinely perform predator removal.

In summary, despite potential adverse cumulative effects on beach nesting and foraging waterbirds, at a time when the availability of elevated beach nesting habitat is declining, the proposed renourishment would return several miles of the beach that are currently intertidal to supratidal, which would be more suitable for nesting. Coupled with long-term active monitoring of nesting activities and predator control, the combined effect would likely be a net benefit on beach-reliant avian species.

Similar to the nearshore effects, dredging at Unnamed Shoal A would again perturb the recovery of benthos upon which seabirds or prey species (e.g., fish) feed, which would reduce the forage value of the shoal. However, given that the spatial extent of the affected area would not expand beyond that which was affected for the initial fill cycle, and that undisturbed areas on the shoal would remain for foraging, effects would not be substantial.

3.4.3.4 Essential Fish Habitat

Coupled with the initial fill cycle, the Proposed Action would have a cumulative adverse effect on EFH, particularly due to the lowering of the shoal's elevation and further reduction in available forage for fish species at higher trophic levels. However as discussed under *Benthos* above, although biological recovery at the borrow area would be prolonged, the effects would only persist for several seasons following disturbance and would not extend beyond the area that was affected by the initial fill cycle.

When considered within the larger context of the inner continental shelf offshore of Virginia and Maryland, nearby shoals such as Blackfish Bank, Chincoteague Shoals, and other unnamed shoals in the area would provide alternate foraging and refuge grounds.

3.4.3.5 Threatened and Endangered Species

Potential cumulative effects on piping plover would be generally the same as those discussed above under beach nesting and foraging *Wildlife*, therefore this section focuses on sea turtles with specific discussion of piping plovers as appropriate. The cumulative effects on in-water sea turtles are discussed in detail in the *Final PEIS*, however where there were no documented adverse interactions during the initial beach fill cycle, this CEA does not provide a detailed discussion and rather focuses on interactions with nesting sea turtles.

Operation of heavy equipment on the Wallops Island beach during renourishment would again compact the beach, which could cause the affected area to be less suitable for sea turtle nesting. The placement of additional fill would also steepen the beach profile, which could lead to scarping in areas. The time of year that the renourishment would be conducted would dictate the likelihood of impacts, with a fall/winter beach fill providing the greatest amount of time for profile equilibration prior to the following nesting season. A beach fill occurring during the spring or summer months would present the greatest potential for effects, however the extent of the affected area would be less than that affected by initial beach fill.

Continued recreational and motorized uses on the beach could inadvertently disturb nesting females, crush eggs within the nest, or crush, entrap, or disturb hatchlings attempting to leave the nest. However, with the continued implementation of the protected species monitoring program on the Wallops Island beach, it is expected that nests would be identified shortly after establishment and marked with signage. Site-specific measures, including relocation of recreational activities, shielding nests from artificial light, or establishment of travel corridors between the nest and ocean could further mitigate any potential effects. Additionally, as vehicular use of the Wallops beach is relatively low, and is limited to WFF employees (who receive protected species awareness training), these effects are not expected to be substantial.

Perhaps the greatest risk to sea turtle success is the predation of eggs and young by mammals, birds, and ghost crabs which may eliminate up to 100 percent of the nests and any hatchlings that emerge on beaches where predation is not managed (NRC 1990). However, in consideration of the predator management program, which includes removal of predator species as well as the establishment of exclosures on identified nests, it is expected that the effects of predation are already mitigated to the greatest extent practicable.

In the longer term, should the re-constructed beach become an area regularly used by nesting and foraging plovers and sea turtles, it could expose them to potential effects of launch operations. However, NASA would continue to follow the terms and conditions of its USFWS programmatic BO (2010), which incorporates aspects of its protected species monitoring program, beach

nourishment program, and launch operations to provide protective measures to the greatest extent practicable.

In summary, despite potential adverse cumulative effects on sea turtles and plovers, at a time when the availability of elevated beach nesting habitat is declining, the proposed renourishment would return several miles of the beach that are currently intertidal to supratidal, which would be more suitable for nesting, therefore providing a net benefit to these beach nesting species.

4 References Cited

Anchor Environmental. 2003. Literature review of effects of re-suspended sediments due to dredging. June. 140 pp.

Blue Ridge Research and Consulting (BRRC). 2011. Noise Monitoring and Airfield Operations Data Collection in Support of NASA Wallops Flight Facility Site-Wide Programmatic EIS. October.

Burlas, M., G. L Ray, & D. Clarke. 2001. The New York District's Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project. Final Report. U.S. Army Engineer District, New York and U.S. Army Engineer Research and Development Center, Waterways Experiment Station.

Clarke, D., C. Dickerson, and K. Reine. 2003. Characterization of underwater sounds produced by dredges. *In* Proceedings of the Third Specialty Conference on Dredging and Dredged Material Disposal, May 5-8, 2002, Orlando, Florida.

Council on Environmental Quality (CEQ). 1997. Considering Cumulative Effects Under the National Environmental Policy Act. January.

_____. 2010. Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions. February 18.

CSA International, Inc., Applied Coastal Research and Engineering, Inc., Barry A. Vittor & Associates, Inc., C.F. Bean, L.L.C., and Florida Institute of Technology. 2009. Analysis of Potential Biological and Physical Impacts of Dredging on Offshore Ridge and Shoal Features. Prepared for the U.S. Department of the Interior, Minerals Management Service, Leasing Division, Marine Minerals Branch, Herndon, VA. OCS Study MMS 2010-010. 160 pp. + apps.

Diaz, R.J., G.R. Cutter, Jr. and C.H. Hobbs, III. 2004. Potential impacts of sand mining offshore Maryland and Delaware: Part 2 – Biological considerations. *J. Coastal Res.* 20(1): 61 – 69.

Diaz, R.J., C.O. Tallent and J.A. Nestlerode. 2006. Benthic Resources and Habitats at the Sandbridge Borrow Area: A Test of Monitoring Protocols. In: MMS OCS Study 2005-056. Field Testing of a Physical/Biological Monitoring Methodology for Offshore Dredging and Mining Operations. pp. 1 – 49.

Dibajnia, M. and R. B. Nairn. 2011. Investigation of Dredging Guidelines to Maintain and Protect the Geomorphic Integrity of Offshore Ridge and Shoal Regimes, U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation and Enforcement, Herndon, Virginia, OCS Study MMS 2011-025. 150 pp. + appendices.

Federal Highway Administration (FHWA). 2006. Construction Noise Handbook, Appendix A FHWA Roadway Construction Noise Model User's Guide, A-1. http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/index.cfm.

_____. 2007. Special Report: Highway construction Noise: Measurement, Prediction, and Mitigation, Appendix A Construction Equipment Noise Levels and Ranges. www.fhwa.dot.gov/environment/noise/highway/hcn06.htm.

Hitchcock, D.R., R.C. Newell, and L.J. Seiderer. 1999. Investigation of benthic and surface plumes associated with marine aggregate mining in the United Kingdom, Final Report. U.S. Department of the Interior, Minerals Management Service. MMS OCS Study No. 99-0029. Contract No. 14-35-0001-30763. 163 pp.

Horton, R. M., V. Gornitz, D.A. Bader, A.C. Ruane, R. Goldberg, & C. Rosenzweig. 2011. Climate Hazard Assessment for Stakeholder Adaptation Planning in New York City. *J. Appl. Meteor. Climatol*. 50 (11), 2247-2266.

International Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. *In* S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor & H. L. Miller (Eds.), (pp. 996): Cambridge University Press.

King. D.B., Jr., D.L. Ward, M.H. Hudgins, and G.G. Williams. 2011. Storm Damage Reduction Project Design for Wallops Island. Version 1.01. USACE, Engineer Research and Development Center. ERDC/LAB TR-11-9. November.

Knuuti, K. 2002. Planning for Sea-Level Rise: U.S. Army Corps of Engineers Policy. Proceedings Solutions to Coastal Disasters '02, American Society of Civil Engineers, 549 - 560.

Minerals Management Service (MMS). 1999. Environmental Report, Use of Federal Offshore Sand Resources for Beach and Coastal Restoration in New Jersey, Maryland, Delaware, and Virginia. Prepared by The Louis Berger Group, Inc. November.

National Aeronautics and Space Administration (NASA). 2003. AQM-37 Operations at the NASA GSFC WFF, Wallops Island, Virginia Final Environmental Assessment.

_____. 2005. Wallops Flight Facility Site-wide Final Environmental Assessment. January.

_____. 2009. Expansion of the Wallops Flight Facility Launch Range Final Environmental Assessment, Wallops Flight Facility. August.

_____. 2010a. Essential Fish Habitat Assessment Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program. Prepared by URS, Inc. February.

_____. 2010b. Shoreline Restoration and Infrastructure Protection Program Final Programmatic Environmental Impact Statement. October.

_____. 2010c. 2010 Wallops Island Seabeach Amaranth Survey Memorandum. September 9.

_____. 2011a. Monitoring and Reporting Plan Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program. February.

_____. 2011b. Wallops Island Protected Species Monitoring Report. Prepared by URS, Inc. Wallops Environmental Office, Wallops Island, Virginia. October.

_____. 2011c. Supplemental Biological Assessment Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program. Prepared by Wallops Environmental Office, Wallops Island, Virginia. August.

_____. 2012a. Wallops Island Protected Species Monitoring Report. Prepared by URS, Inc. Wallops Environmental Office, Wallops Island, Virginia.

_____. 2012b. North Wallops Island Unmanned Aerial Systems Airstrip Final Environmental Assessment. June.

_____. 2013a. Federal Consistency Determination Wallops Island Post-Hurricane Sandy Beach Renourishment. March 8.

_____. 2013b. Supplemental Essential Fish Habitat Assessment Wallops Island Post-Hurricane Sandy Beach Renourishment. February 26.

_____. 2013c. NMFS Endangered Species Act Consultation Correspondence for Wallops Island Post-Hurricane Sandy Beach Renourishment. March 7.

_____. 2013d. USFWS Endangered Species Act Consultation Correspondence for Wallops Island Post-Hurricane Sandy Beach Renourishment. February 25.

_____. 2013e. VDHR Section 106 Consultation Correspondence for Wallops Island Post-Hurricane Sandy Beach Renourishment. February 4.

National Marine Fisheries Service (NMFS). 2012. Biological Opinion Wallops Island Shoreline Restoration and Infrastructure Protection Program (Reinitiation). Northeast Region. August 3.

National Research Council (NRC). 1987. Responding to Changes in Sea Level: Engineering Implications. National Academy Press, Washington, DC. 148 pp.

_____. 1990. Committee on Sea Turtle Conservation. Decline of sea turtles: causes and prevention. National Academy Press. Washington, DC. 259 pp.

Newell, R.C., L.J. Seiderer. 2003. Ecological Impacts of Marine Aggregate Dredging on Seabead Resources. Prepared for Baird Associates, Ontario, Canada. 58 pp.

Reine, K. J., D.G. Clarke, and C. Dickerson. *In prep*. Characterization of Underwater Sounds Produced by a Trailing Suction Hopper Dredge during Sand Mining and Pump-out Operations. DOER Technical Report Collection (ERDC-TN-DOER-EXX), U. S. Army Engineer Research and Development Center, Vicksburg, Mississippi. www.wes.army.milk/el/dots/doer

U.S. Army Corps of Engineers (USACE). 1983. Dredging and Dredged Material Disposal, EM 1110-2-5025, Washington, D.C. March.

U.S. Fish and Wildlife Service (USFWS). 2010. Programmatic Biological Opinion on the Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program. Gloucester, Virginia Field Office. July 30.

Wiener, F.M. and D.N. Keast. 1959. Experimental Study of the Propagation of Sound Over Ground. *J. Acoust. Soc. Am.* 31 (6): 724-733.

Wilber, D.H., D.G. Clarke & M.H. Burlas. 2006. Suspended sediment concentrations associated with a beach nourishment project on the northern coast of New Jersey. *J. Coastal Res.* 22 (5): 1035 – 1042.

5 Agencies and Persons Consulted

Copies of the Draft EA were sent to the following agencies, organizations, and individuals.

Name	Organization
Federal Agencies	
Mr. Geoffrey Wikel	BOEM, Branch of Environmental Coordination
Ms. Barbara Rudnick	EPA, Region III
Ms Trish Kicklighter	NPS, Assateague Island National Seashore
Mr. Doug Crawford	NOAA, Command and Data Acquisition Station
Mr. David O'Brien	NOAA, Habitat Conservation Division
Ms. Danielle Palmer	NOAA, Protected Resources Division
Mr. Robert Cole	USACE, Norfolk District Regulatory Program
LT Mark Merriman	USCG, Sector Field Office Eastern Shore
Mr. Joseph Murphy	U.S. Navy, Fleet Forces Command
CDR John Robinson	U.S. Navy, Surface Combat Systems Center
Mr. Louis Hinds, III	USFWS, Chincoteague National Wildlife Refuge
Ms. Cindy Schulz	USFWS, Virginia Field Office
State Agencies	
Mr. Dale Nash	Virginia Commercial Space Flight Authority
Ms. Rene Hypes	Virginia Department of Conservation and Recreation
Ms. Sheri Kattan	VDEQ, Office of Wetlands and Water Protection
Ms. Ellie Irons	VDEQ, Office of Environmental Impact Review
Mr. Ray Fernald	VDGIF, Environmental Services Section
Ms. Amanda Lee	VDHR, Office of Review and Compliance
Ms. Karen Duhring	Virginia Institute of Marine Science
Mr. Hank Badger	VMRC, Habitat Management Division

Name	Organization
Local Government	
Mr. Steven Miner	Accomack County Administration
Mr. Grayson Chesser	Accomack County Board of Supervisors
Ms. Wanda Thornton	Accomack County Board of Supervisors
Mr. Ronald Wolff	Accomack County Board of Supervisors
Mr. David Fluhart	Accomack County Building and Zoning
Mr. Curtis Smith	Accomack-Northampton Planning District Commission
Mr. Robert Ritter, Jr.	Town of Chincoteague, Virginia
Mayor John Tarr	Town of Chincoteague, Virginia
Tribal Government	
Ms. Caitlin Totherow	Catawba Indian Nation
Chief Dennis Coker	Lenape Indian Tribe of Delaware
Chief Norris Howard, Sr.	Pocomoke Indian Nation
Other Organizations & Individuals	
Dr. Arthur Schwarzschild	Anheuser-Busch Coastal Research Center
Ms. Kathy Phillips	Assateague Coastal Trust
Ms. Suzanne Taylor	Chincoteague, Virginia Chamber of Commerce
Mr. Denard Spady	Citizens for a Better Eastern Shore
Ms. Jean Hungiville	Eastern Shore Chamber of Commerce
Mr. Peter Bale	Eastern Shore Defense Alliance
Ms. Amber Parker	Marine Science Consortium
Mr. Dave Wilson, Jr.	Maryland Coastal Bays Program
Mr. Joseph Fehrer	The Nature Conservancy
Mr. Stephen Parker	The Nature Conservancy, Virginia Coast Reserve
Mr. Randy Fox	Trails End Campground
Federal & State Elected Officials	
Honorable Mr. Andrew Harris	U.S. House of Representatives, State of Maryland

Name	Organization
Federal & State Elected Officials (cont.)	
Honorable Mr. Scott Rigell	U.S. House of Representatives, State of Virginia
Honorable Mr. Ben Cardin	U.S. Senate, State of Maryland
Honorable Ms. Barbara Mikulski	U.S. Senate, State of Maryland
Honorable Mr. Tim Kaine	U.S. Senate, State of Virginia
Honorable Mr. Mark Warner	U.S. Senate, State of Virginia
Honorable Mr. Norman Conway	Maryland House of Delegates
Honorable Mr. Michael McDermott	Maryland House of Delegates
Honorable Mr. Charles Otto	Maryland House of Delegates
Honorable Mr. James Mathias, Jr.	Maryland Senate
Honorable Mr. Lynwood Lewis, Jr.	Virginia House of Delegates
Honorable Mr. Ralph Northam	Virginia Senate

THIS PAGE INTENTIONALLY LEFT BLANK

6 Preparers and Contributors

The following persons contributed to the preparation of this EA.

Name	Title	Areas of Responsibility in EA
NASA		
Paul Bull	Civil Engineer	Alternatives, Document review
Joshua Bundick	Environmental Protection Specialist	Document Preparation
BOEM		
Jennifer Culbertson	Oceanographer	Document Review
Kimberly Skrupky	Marine Biologist	Document Review
Sally Valdes	Fisheries Biologist	Document Review
Geoffrey Wikel	Chief, Branch of Environmental Coordination	Document Review
USACE		
Robert Cole	Environmental Scientist	Document Review
Mark Hudgins	Civil Engineer	Purpose and Need, Alternatives
David King, Jr.	Research Hydraulic Engineer	Project Design, Sea Level Rise
George Mears	Environmental Engineer	Purpose and Need, Alternatives
Marty Underwood	Biologist	Document Review
LJT & Associates, Inc. (contractor to NASA)		
Alexander Brown	GIS Analyst	Borrow Area Topography, Figures
Ross McAllen	GIS Analyst	Figures

Appendix A

Agency Coordination

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix A Correspondence Index

DOCUMENT NUMBER	DATE	FROM	TO	SUBJECT
001	January 11, 2013	Virginia Marine Resources Commission (VMRC)	NASA	Existing Permit Applicability
002	March 18, 2013	U.S. Army Corps of Engineers (USACE)	NASA	Existing Permit Applicability
003	March 20, 2013	Virginia Department of Historic Resources	NASA	Cultural Resources Compliance Protocol
004	March 20, 2013	U.S. Fish & Wildlife Service	NASA	Existing Programmatic Biological Opinion Applicability
005	March 21, 2013	National Marine Fisheries Service (NMFS) – Protected Resources Division	NASA	Existing Biological Opinion Applicability and Consideration of New Information
006	April 24, 2013	NMFS – Habitat Conservation Division (HCD)	NASA	Essential Fish Habitat (EFH) Conservation Recommendations
007	April 29, 2013	NASA	NMFS-HCD	Acceptance of EFH Conservation Recommendations
008	May 9, 2013	Virginia Department of Environmental Quality (VDEQ)	NASA	Existing Permit Waiver Applicability
009	May 20, 2013	VDEQ	NASA and USACE	Existing Permit Waiver Applicability
010	May 28, 2013	NASA	VMRC and USACE	Proposed Change in Permitted Project Design
011	June 11, 2013	VMRC	NASA	Authorization of Proposed Change in Project Design

THIS PAGE INTENTIONALLY LEFT BLANK

Document 001
Virginia Marine Resources Commission
January 11, 2013

Subject: NASA 10-2003
Date: Friday, January 11, 2013 12:58:00 PM ET
From: Badger, Hank (MRC)
To: Bundick, Joshua A. (WFF-2500)

Josh,
I've talked to Tony today and we both agree that your existing above permit gives NASA the authorization (from VMRC) to place sand on the beach on an as needed bases until February 22, 2016, provide NASA does not exceed the permitted footprint or heights. The permit may/could be renewed for an additional 5 years if NASA request it prior to Feb. 2016.

However, if NASA uses upland sand instead of the permitted dredge site, a permit modification would be required. We could handle that modification in house provided the sand used is >90% sand.

Let me know if you need anything else.
Hank

THIS PAGE INTENTIONALLY LEFT BLANK

Document 002
U.S. Army Corps of Engineers
March 18, 2013

Subject: Beach Repair (UNCLASSIFIED)
Date: Monday, March 18, 2013 9:47:34 AM ET
From: Cole, Robert H NAO
To: Bundick, Joshua A. (WFF-2500)
CC: Turner, Carolyn (WFF-2500), Bull, Paul C. (WFF-2280), Mears, George H NAO

Classification: UNCLASSIFIED
Caveats: NONE

Josh,

The repair work you are proposing is within the scope and construction time frame for the permit the Corp issued last year. Since you are coordinating with all of the agencies, there is no requirement for any additional Department of the Army Permits at t his time. Please remember that any changes to the scope of the project will require a permit modification.

If you need any assistance or want to discuss the project, please give me a call.

Robert Cole
Eastern Virginia Regulatory Section
PO Box 125
Greenbackville, VA 23356
(757) 903- 1562

Classification: UNCLASSIFIED
Caveats: NONE

THIS PAGE INTENTIONALLY LEFT BLANK

Document 003
Virginia Department of Historic Resources
March 20, 2013

received February 25, 2013

National Aeronautics and
Space Administration

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

Reply to Attn of: 228

February 25, 2013

Office of Review and Compliance
Attn: Ms. Amanda Lee
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Subject: Section 106 Consultation for Wallops Island Beach Renourishment
NASA, Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, VA

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, this letter serves to inform VDHR that NASA is proposing to renourish the Wallops Island beach in response to damages sustained during Hurricane Sandy.

Similar to the initial beachfill project conducted in 2012 (VDHR File #: 2007-0084), NASA would obtain the necessary sand from an offshore shoal in Federal waters and would require authorizations from both the U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) and the U.S. Army Corps of Engineers (USACE).

The BOEM has jurisdiction over mineral resources on the Federal Outer Continental Shelf (OCS) and would enter into a negotiated agreement with NASA and USACE pursuant to section 8(k)(2)(d) of the OCS Lands Act. Under Section 404 of the Clean Water Act (CWA), the 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 of 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. Finally; in addition to its regulatory role in the project, the USACE Norfolk District is overseeing project design, construction, and monitoring on NASA's behalf.

To this end, NASA has assumed the role of Lead Federal Agency for NHPA compliance and both BOEM and USACE are participating in NASA's Section 106 process. The effects of their actions are considered in all project documents, including this correspondence.

Background

On December 13, 2010, NASA issued a *Record of Decision (ROD)* for its *Final Programmatic Environmental Impact Statement Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (Final PEIS)*. In its *ROD*, NASA selected for implementation Alternative 1, Seawall Extension and Beach Fill.

As identified in the *Final PEIS* and *ROD*, the initial phase of the project entailed NASA extending its existing rock seawall approximately 1,415 feet (ft) south and then dredging and placing approximately 3.2 million cubic yards (CY) of sand from an offshore shoal referred to as Unnamed Shoal A.

After issuing its *ROD* and securing necessary permits, NASA and its technical partner, the USACE Norfolk District, oversaw the construction of the project between April and August 2012. Both during and after completing the initial beach fill cycle, the agencies have sponsored multiple topographic and hydrographic surveys of the project area. The most recent monitoring effort, conducted in November 2012 following Hurricane Sandy, identified the need to renourish the beach.

The survey data indicate the area that sustained the greatest damage is the southern half of the project site; behind which are some of NASA and the Commonwealth of Virginia's most critical launch assets, including Launch Complex 0 and five sounding rocket pads, are located. Of particular concern is the fact that the seaward half of the dune has been lost in most places and the beach berm has been lowered by at least several feet. Although it can be expected that some of the sand moved offshore will eventually move back into the intertidal zone on the beach, those areas of highest elevation (i.e., dune and berm) would require renourishment to regain their full functionality.

Description of the Undertaking

Upon receipt of the abovementioned authorizations, NASA would contract the dredging of up to 800,000 cubic yards of sand from the same borrow area that was the source of material for the initial beach fill. Given the distance of the borrow area from Wallops Island, it is expected that the contractor would again use one or more trailing suction hopper dredge(s) to obtain the material.

Nearshore, it is expected that the contractor would employ construction methods requiring one or more anchored pumpout station(s) approximately 2 miles east of Wallops Island in 25-30 feet of water. Up to several miles of submerged steel pipeline would be temporarily placed on the seafloor and would be the conduit by which the sand/water slurry would be pumped from the dredge to the beach. Once discharged onto the beach, mechanized equipment (e.g., bulldozers) would grade the material to the design template.

The linear extent of the proposed beachfill would be approximately 2.3 miles described generally as the shoreline between the Z-100 camera stand on the south up to just beyond the Horizontal Integration Facility located mid-island.

Following beachfill, NASA would re-plant the dunes with native vegetation and install sand fencing to trap windblown sand.

Depending upon the amount of funding available for the project, it is also possible that NASA would further extend its rock seawall to the south, however the additional distance would remain within the maximum 4,600 foot distance described in the *Final PEIS*.

In summary, with the exception of a shortened time between initial fill and the first renourishment cycle, the proposed undertaking is substantially equivalent to the renourishment component described in the *Final PEIS*, which estimated that approximately 806,000 CY of material would be needed every 3-7 years.

Area of Potential Effects (APE)

Similar to the initial beach fill cycle, the APE would consist of the offshore sand shoal, the generally defined nearshore zone within which the anchored pumpout station(s) and pipeline would be located, and the Wallops Island beach (see enclosed map).

Identification of Resources

In November 2003, URS Group, Inc. and EG&G prepared a Cultural Resources Assessment of Wallops Flight Facility, Accomack County, Virginia that examined each of the three land areas of the facility within WFF's property boundaries: Wallops Main Base, Wallops Mainland, and Wallops Island. This report established a predictive model for archaeological potential for the entire WFF property. VDHR concurred with the findings of this report in a letter dated December 3, 2003.

In December 2004, URS and EG&G prepared a Historic Resources Survey and Eligibility Report for Wallops Flight Facility that included an evaluation of buildings and structures at WFF built prior to 1956 for their eligibility for listing in the National Register of Historic Places (NRHP). Two resources—the Wallops Coast Guard Lifesaving Station (VDHR #001-0027-0100; WFF# V-065) and its associated Coast Guard Observation Tower (001-0027-0101; WFF# V-070)—were found to be eligible for listing in the NRHP and Virginia Landmarks Register. The other surveyed resources were determined not to be NRHP eligible because they lacked the historical significance or integrity necessary to convey significance. In a letter dated November 4, 2004, the VDHR concurred with the findings and determinations in the Historic Resources Survey and Eligibility Report.

In accordance with BOEM nautical archaeology guidelines, the proposed offshore borrow area was surveyed by URS Group, Inc., in 2009 and determined to be clear of submerged archaeological resources.

Onshore, NASA contracted with URS Group, Inc., in 2006, 2007, and 2009 to survey the Wallops Island beach for potential archaeological and architectural resources that could be affected by shoreline restoration work; none were identified. Subsequent to the shoreline-specific studies, in 2011 NASA commissioned a follow-on Historic Resources Eligibility Survey (DHR File No. 2010-2274), which continued the evaluation of multiple structures on Wallops Island for National Register eligibility. None were determined to meet the necessary criteria for eligibility.

In 2012, the prime contractor for initial beach fill project, Great Lakes Dredge & Dock Company, LLC, sub-contracted Gahagan & Bryant Associates to conduct marine remote sensing surveys of all proposed mooring locations. No obstructions or areas of archeological concern were identified within the proposed work areas (refer to VDHR File#: 2007-0084, letter from NASA dated March 8, 2012). However it is possible that the contractor for the proposed renourishment would anchor his equipment in different locations than those previously surveyed. Therefore, additional survey work may be necessary to fully assess the potential for resources within the APE.

Future Survey of APE and Chance Finds Protocol

Consistent with the approach taken during the initial beach fill cycle, NASA proposes to require its dredge contractor to survey proposed pumpout locations prior to anchoring them in previously unsurveyed areas. Though NASA would encourage the contractor to utilize nearshore areas that have already been surveyed, the ultimate decision would be left the contactor with the stipulation that if the proposed mooring location is outside of those areas already surveyed, a remote sensing survey (e.g., side scan sonar, magnetometer) shall be conducted prior to anchor placement. Any identified anomalies would be avoided to mitigate potential adverse effects.

Consistent with the other two terms of the agreement developed between VDHR and NASA for the initial beach fill cycle, should the dredge contractor discover a resource of potential archaeological significance, he shall be required to establish a 1,000-foot buffer around the discovery, establish the precise location of the discovery, and notify the NASA Historic Preservation Officer. NASA would immediately consult with VDHR regarding the National Register eligibility and treatment of the discovery, however work would continue outside the 1,000-foot buffer.

Determination of Effect

Given the lack of potential resources within areas already surveyed, and the above-summarized procedures that would be employed should new sites be identified for nearshore pumpout, NASA concludes that there would be *"no historic properties affected"* by the proposed undertaking.

Your concurrence with this determination is respectfully requested. For your convenience, a signature line is included at the bottom of this correspondence. If you have any questions, please contact me, Randall Stanley, at (757) 824-1309, or Josh Bundick at (757) 824-2319.

Sincerely,

Randall M. Stanley

Randall M. Stanley
WFF Historic Preservation Officer

Enclosure

5

cc:
228/Mr. G. Lilly
250/Mr. J. Bundick
BOEM/Mr. G. Wikel
USACE/Mr. R. Cole

Provided that NASA requires its dredge contractor to follow the above-described project conditions, the Virginia Department of Historic Resources concurs with NASA that the proposed undertaking (renourishment of the Wallops Island beach) would have no effect on National Register-eligible properties.

M. Amanda Poe

Office of Review and Compliance
Virginia Department of Historic Resources

March 20, 2013
Date

THIS PAGE INTENTIONALLY LEFT BLANK

Document 004
U.S. Fish and Wildlife Service
March 20, 2013

Subject: RE: Post-Hurricane Sandy beach renourishment Wallops Island Flight Facility
Date: Wednesday, March 20, 2013 2:30:45 PM ET
From: Mike Drummond
To: Bundick, Joshua A. (WFF-2500)

Josh,
The 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.
Mike

From: Bundick, Joshua A. (WFF-2500) [mailto:joshua.a.bundick@nasa.gov]
Sent: Wednesday, March 20, 2013 2:27 PM
To: Mike Drummond
Subject: Re: Post-Hurricane Sandy beach renourishment Wallops Island Flight Facility

Hi Mike, thanks for the response.

Quick question, as you may recall from the letter we sent, we are also considering, on a funds available basis, either some additional rock seawall extension or repair, which would be done prior to beachfill, and then covered with sand. All work would be confined to the 4,600 foot maximum length considered in the SRIPP BA and PBO.

Please confirm that this does not present any issues.

Best,

Josh

Joshua Bundick
Lead, Environmental Planning
NASA Wallops Flight Facility
Wallops Island, VA 23337
O: (757) 824-2319
F: (757) 824-1819
Joshua.A.Bundick@nasa.gov

From: Mike Drummond <mike_drummond@fws.gov>
Date: Wednesday, March 20, 2013 2:16 PM
To: "Bundick, Joshua A. (WFF-2500)" <Joshua.A.Bundick@nasa.gov>
Cc: "troy_andersen@fws.gov" <troy_andersen@fws.gov>, Cindy Schulz <cindy_schulz@fws.gov>
Subject: Post-Hurricane Sandy beach renourishment Wallops Island Flight Facility

We have reviewed the project proposal dated February 25, 2013 for the proposed post-Hurricane Sandy beach nourishment at Wallops Island, Virginia. The following comments are provided under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended.

The National Aeronautics and Space Administration (NASA) plans to obtain the necessary sand from an offshore shoal in Federal waters. This sand acquisition will require authorizations from both the U.S. Department of the Interior's Bureau of Ocean Energy Management and the U.S. Army Corps of Engineers. Upon receipt of the required authorizations, NASA will contract for the dredging and placement of up to

800,000 cubic yards of sand from the borrow area (Unnamed Shoal A, sub-area A-1) off-shore.
The linear extent of the proposed sand renourishment will be approximately 2.3 miles (the shoreline between the Z-100 camera stand on the south, to just beyond the Horizontal Integration Facility located mid-island). Work on the north end of the Wallops Island beach is not planned with the exception of the construction contractor potentially utilizing the area just north of the rock seawall terminus as a point of ingress/egress.

It is expected that the dredging and sand renourishment work will take 1.5 to 3 months to complete. The timing of the work will be dependent upon contractor availability; therefore the U.S. Fish and Wildlife Service is assuming that the project could be conducted at any time of year.

The U.S. Fish and Wildlife Service concurs with NASA's determination that the project, as proposed, is included in the July 30, 2010 Programmatic Biological Opinion (PBO) on the Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program. While the proposed project has a shortened time between initial fill and the first renourishment cycle, the proposed action is comparable to the renourishment component described in the PBO (approximately 806,000 cubic yards of material every 3-7 years).
Any anticipated incidental take of piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), or seabeach amaranth (*Amaranthus pumilus*) for the subject project is covered by the PBO. Should project plans change or if additional information on the distribution of listed species or critical habitat becomes available, this determination may be reconsidered.

This document should be appended to the July 30, 2010 PBO and maintained as part of the decision document and administrative record.

If you have any questions, please contact me.

Mike Drummond
Endangered Species Biologist
U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061
(804) 693 - 6694 x122
(804) 654 - 1771 cell

Document 005
National Marine Fisheries Service – Protected Resources Division
March 21, 2013

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

MAR 21 2013

Carolyn Turner, Associate Chief
National Aeronautics and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, Virginia 23337-5099

Attn: 250.W

Dear Ms. Turner,

We have reviewed your March 7, 2013, letter regarding National Aeronautics and Space Administration's (NASA) proposed post-Hurricane Sandy beach renourishment at Wallops Flight Facility, Wallops Island, Virginia. Pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended, we consulted previously on NASA's Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (SRIPP), resulting in NOAA's, National Marine Fisheries Service (NMFS) issuance of a biological opinion (BO) to NASA on August 3, 2012.[1] As the action proposed to be undertaken does not differ significantly from the actions we considered in the 2012 SRIPP BO, we concur with your determination that the proposed beach renourishment does not trigger the need to reinitiate formal consultation pursuant to section 7 of the ESA, as amended. Our supporting analysis is provided below.

Proposed Action and NMFS Consultation History

The SRIPP is a 50 year plan of restoring and protecting NASA's Wallops Flight Facility's shoreline and infrastructure. Under the SRIPP, NASA proposes to extend an existing seawall, as well as restore, and maintain, the Wallops Flight Facility shoreline in order to move the zone of wave break away from launch pads, infrastructure, and testing and training facilities. Initial phases of the SRIPP include the extension of the seawall (landward of the shoreline), followed by dredging, via a hopper dredge, approximately 4.3 million cubic yards (cy) of sand from an offshore shoal (referred to as Unnamed Shoal A) and placing this material as beach nourishment along the Wallops Flight Facility Shoreline. Over the 50 year life of the SRIPP, NASA proposes to undertake subsequent beach renourishment operations approximately every 5 years. Per renourishment cycle, approximately 1,007,500 cy of sand will be removed, via a hopper dredge,

[1] NASA served as the lead Federal agency for the 2012 SRIPP BO; co-action agencies on the 2012 SRIPP BO included the U.S. Army Corps of Engineers (USACE) and the Bureau of Ocean Energy Management (BOEM). For the currently proposed beach renourishment, NASA will remain the lead Federal agency, with the USACE and BOEM serving as co-action agencies.

from Unnamed Shoal A and placed along the same area of the Wallops Flight Facility's shoreline.

Since 2007 we have consulted with NASA on the SRIPP, with NMFS issuing a BO to NASA on September 25, 2007 (Re: initial SRIPP proposal); July 22, 2010 (Re: modification to the SRIPP); and August 3, 2012 (Re: listing of Atlantic sturgeon). The August 3, 2012, BO concluded that the SRIPP is likely to adversely affect, but is not likely to jeopardize the continued existence of the Northwest Atlantic Ocean Distinct Population Segment (DPS) of loggerhead sea turtle; Kemp's ridley sea turtles; the Gulf of Maine (GOM) DPS of Atlantic sturgeon; New York Bight (NYB) DPS of Atlantic sturgeon; Chesapeake Bay (CB) DPS of Atlantic sturgeon; Carolina DPS of Atlantic sturgeon; or South Atlantic (SA) DPSs of Atlantic sturgeon, and is not likely to adversely affect leatherback or green sea turtles or North Atlantic right, humpback or fin whales. The Opinion included an Incidental Take Statement (ITS) exempting the incidental taking of no more than 1 sea turtle for approximately every 1.6 million cy of material removed from the shoal area, which over the life of the project exempted the take of 9 total sea turtles, with no more than 1 being Kemp's ridleys and the remainder being loggerheads. In addition, the ITS exempted the incidental take of no more than 1 Atlantic sturgeon for approximately every 9.4 million cy of material removed from the borrow areas, which over the life of the project exempted the take of 2 subadult Atlantic sturgeon, with the potential that the two sturgeon taken may come from the NYB, CB, GOM, Carolina, or SA DPS.

Seawall construction and initial phases of beach nourishment were completed in August 2012. Since this time, multiple topographic and hydrographic surveys of the project site have been undertaken. The most recent monitoring effort, conducted in November 2012, following Hurricane Sandy, identified the need to renourish the Wallops Flight Facility beach sooner than the projected 5 years. As a result, NASA is requesting authorization to dredge, via hopper dredge, approximately 1,000,000 cy of material from Unnamed Shoal A for placement of this material as beach renourishment along the same area of the Wallops Flight Facility Shoreline. It is estimated that dredging and beach fill work will take between 1.5 to 3 months to complete; however, the timing of the work will be dependent on contractor availability and thus, at this time, it is unknown during what time of year the work will be undertaken. All other components of the SRIPP would remain as described and analyzed in the August 3, 2012 BO.

NMFS listed species in Project 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 CFR § 402.02). The action area for this consultation includes the Wallops Island offshore unnamed shoal, the waters between and immediately adjacent to these areas where project vessels will travel and dredged material will 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 shoreline and nearshore waters that will be affected by beach fill (i.e., approximately 2.3 miles of shoreline). As dredging operations will also produce underwater noise levels that range between 120-160 dB re $1\mu Pa_{RMS}$ the action area will also include the area around the dredge where effects of increased underwater noise levels will

2

be experienced. Based on the analysis of dredge noise and transmission loss calculations, effects of dredge noise will be experienced within 794 meters from the dredge during loading and pumping.

The following ESA listed species under NMFS jurisdiction may occur in the action area of the SRIPP[2]:

Atlantic Sturgeon	
Gulf of Maine Distinct Population Segment (DPS) of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus)*	Threatened
New York Bight DPS of Atlantic sturgeon	Endangered
Chesapeake Bay DPS of Atlantic sturgeon	Endangered
Carolina DPS of Atlantic sturgeon	Endangered
South Atlantic DPS of Atlantic sturgeon	Endangered
Sea Turtles	
Northwest Atlantic Ocean DPS of loggerhead sea turtle (*Caretta caretta*)	Threatened
Kemp's ridley sea turtle (*Lepidochelys kempi*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Cetaceans	
North Atlantic Right Whales (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered

Section 7 Conclusions

Reinitiation of consultation is required and shall be requested by the Federal agency or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of incidental take is exceeded; (b) a new species is listed or critical habitat designated that may be affected by the identified action; (c) the agency action is subsequently modified in a manner that causes an effect to the listed species or

[2] Please see http://www.nero.noaa.gov/Protected/section7/bo/actbiops/2012_nasa_s_sripp_bo.pdf for detailed description of each species.

3

critical habitat that was not considered in the consultation; or (d) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered.

We have reviewed the information provided by you to determine if any of these triggers for reinitiation have been met. Throughout the initial phase of dredging and beach nourishment, there were no takes of any listed species. Since dredging was completed in August 2012, no additional dredge cycles have been undertaken and thus, to date, the amount of incidental take has not been exceeded. Additionally, no new species or critical habitat have been listed/designated. Also, while beach renourishment operations are occurring sooner than projected (i.e., sooner than 5 years), the renourishment operations themselves (e.g., type of dredge vessel, quantity of material removed, placement location) have remained the same as described in the August 2012, BO and therefore, this change will not affect listed species in a manner or to an extent not previously considered in the August 3, 2012, BO. Also, although you have provided new information on the underwater noise levels produced during dredging operations, this new information does not reveal effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered. In fact, the revised estimates of distances to the Marine Mammal Protection Act Harassment thresholds, as well as acoustic thresholds for sea turtles and Atlantic sturgeon, are comparable to those considered in the August 3, 2012 BO.

Based on this analysis of the re-initiation triggers, we have determined that the conclusions reached in our August 3, 2012, BO remain valid and thus, reinitiation of ESA section 7 formal consultation will not be necessary. Therefore, no further consultation pursuant to section 7 of the ESA is required. Should you have any questions about this correspondence please contact Danielle Palmer at (978) 282-8468 or by e-mail (Danielle.Palmer@noaa.gov).

Sincerely,

for John K. Bullard
Regional Administrator

Ec: Bundick, NASA
Dirk, BOEM
Gibson, ACOE/Norfolk
Palmer, NMFS/NER/PRD
O'Brien, NMFS/HCD

File Code: NASA-2013 SRIPP No need to Reinitiate-Hurricane Sandy

4

Document 006
National Marine Fisheries Service – Habitat Conservation Division
April 24, 2013

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

APR 24 2013

Mr. Joshua A. Bundick
NEPA Program Manager
Code 250.W
National Aeronautics and Space Administration
Goddard Space Flight Center, Wallops Flight Facility
Wallops Island, Virginia 23337

Re: Supplemental Essential Fish Habitat Assessment; post-Hurricane Sandy beach nourishment, NASA Wallops Island, Virginia

Dear Mr. Bundick,

We have reviewed the National Aeronautics and Space Administration's (NASA) supplemental essential fish habitat (EFH) assessment for the proposed post-Hurricane Sandy beach renourishment at Wallops Island, Virginia which incorporates by reference the February 2010 *EFH Assessment Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program (SRIPP EFH Assessment).* The initial 3.7 mile beach fill of the SRIPP was conducted between April and August 2012. However, the most recent monitoring effort conducted in November 2012 following Hurricane Sandy indicates the need to renourish the beach in order to provide the designed level of storm protection to NASA and the Commonwealth of Virginia's critical launch infrastructure located on the southern end of Wallops Island. The greatest damage to the seawall and beach occurred on the southern portion of the project site where the seaward half of the dune has been lost in most places and the beach profile was lowered at least several feet.

As you know, the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with us on all actions, or proposed actions, permitted, funded, or undertaken, that may adversely affect EFH. As the lead Federal agency for this project, you are responsible for the EFH consultation. Based on our review of the supplemental EFH assessment for the post-Hurricane Sandy beach renourishment at Wallops Island, our comments and conservation recommendations are provided below.

Renourishment of Dune and Beach Berm
The proposed renourishment of the beach and dune would utilize the same offshore shoal as the initial beach fill, referred to as Unnamed Shoal A, located approximately 5 miles east of Assateague Island and dredged using a hydraulic hopper dredge. Assuming a conservative 25% loss of material during pump-out and placement, approximately 1,000,000 cubic yards (CY) of material is required to restore full functionality to the dune and beach berm. You have estimated it will take between 1.5-3 months to complete the work which may be conducted at any time of the year depending upon the availability of the dredging contractor. Dependent on available

funding, you may extend the existing rock seawall to the south, though within the maximum 4,600 ft. distance described in the *SRIPP EFH Assessment*.

With the exception of the shortened time frame, we acknowledge that this renourishment cycle is essentially equivalent to the project's renourishment component described in the 2010 *SRIPP EFH Assessment* and *Final PEIS* that estimated approximately 806,000 CY of material would be required every 3-7 years.

Magnuson-Stevens Act Conservation Recommendations

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 we have stated, the project area is designated as EFH for various life stages of 26 federally managed species including red hake (*Urophycis chuss*), windowpane flounder (*Scopthalmus aquosus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), summer flounder (*Paralicthys dentatus*), winter flounder (*Pleuronectes americanus*), witch flounder (*Glyptocephalus cynoglossus*) scup (*Stenotomus chrysops*), black sea bass (*Centropristus striata*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), cobia (*Rachycentron canadum*), sand tiger shark (*Odontaspis taurus*), Atlantic sharpnose shark (*Rhizopriondon terraenovae*), Atlantic angel shark (*Squatina dumerili*), dusky shark (*Charcharinus obscures*), sandbar shark (*Charcharinus plumbeus*), scalloped hammerhead shark (*Sphyrna lewini*), tiger shark (*Galeocerdo cuvieri*), clearnose skate (*Raja eglanteria*), little skate (*Leucoraja erinacea*), monkfish (*Lophius americanus*), spiny dogfish (*Squalus acanthias*), surf clam (*Spisula solidissima*), and winter skate (*Leucoraja ocellata*). Therefore, pursuant to 305(b)(4)(A) of the MSA , we recommend that you adopt the following EFH conservation recommendations:

1. Unnamed Shoal A, sub-area A-1 (an accretion area) should be targeted for dredging to obtain the necessary beach fill material. Using the same area dredged during the initial beach fill will limit impacts where the benthic community has already been recently removed or disturbed.

2. Dredging should occur over a large area, though not over the entire length of the shoal and avoid creating deep pits. Depth of cut should not exceed 10 ft. and should be confirmed through post-dredge survey.

3. The reconstructed dune area should be stabilized with native vegetation and sand fencing should be installed to help reduce windblown sand loss and potentially reduce future offshore borrow requirements.

Provided the Conservation Recommendations listed above are accepted and implemented into the project, we concur with your determination that the proposed dune and beach renourishement on Wallops Island will not substantially adversely affect EFH.

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

Section 7 of the Endangered Species Act (16 U.S.C. § 1536(a)(2)) requires Federal agencies to consult with the Secretary of Commerce, through NOAA, to insure that "any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or adversely modify or destroy [designated] critical habitat . . . ." *See also* 50 C.F.R. part 402. Please contact Ms. Christine Vaccaro of our Protected Resources Division at 978-281-9167 to discuss your consultation obligations under Section 7 of the ESA regarding potential impacts to the federally listed sea turtles.

Conclusions

Thank you for the opportunity to comment on the supplemental EFH assessment prepared for this important project. Please feel free to contact Mr. David O'Brien of our Gloucester Point, VA field office at 804-684-7828 (David.L.O'Brien@noaa.gov) if you have any questions regarding these comments or recommendations.

Sincerely,

for Louis A. Chiarella
Assistant Regional Administrator
Habitat Conservation Division

THIS PAGE INTENTIONALLY LEFT BLANK

Document 007
National Aeronautics and Space Administration
April 29, 2013

National Aeronautics and
Space Administration

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

Reply to Attn of: 250.W

April 29, 2013

Mr. Louis Chiarella
Assistant Regional Administrator
Habitat Conservation Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear Mr. Chiarella:

Thank you for the April 24, 2013 letter offering Conservation Recommendations (CRs) for the proposed Wallops Island Post-Hurricane Sandy Shoreline Repair project.

In accordance with Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, this correspondence serves as the National Aeronautics and Space Administration's (NASA) acceptance of the three CRs provided.

We appreciate the ongoing coordination with your agency as NASA continues its efforts to reduce storm damage to the launch assets on Wallops Island. If you have any questions or require additional information please contact Mr. Joshua Bundick of my staff at (757) 824-2319.

Sincerely,

Carolyn Turner
Associate Chief, Medical and Environmental Management Division

cc:
228/Mr. P. Bull
250/Mr. J. Bundick
250/Mr. E. Connell
BOEM/Mr. G. Wikel
NMFS/Mr. D. O'Brien
USACE /Mr. R. Cole

THIS PAGE INTENTIONALLY LEFT BLANK

Document 008
Virginia Department of Environmental Quality
May 9, 2013

Subject: RE: FCD for Wallops Shoreline Repair (DEQ 13-046F)
Date: Thursday, May 9, 2013 10:45:50 AM ET
From: Kattan, Sheri (DEQ)
To: Bundick, Joshua A. (WFF-2500)
CC: Fisher, John (DEQ), Cole, Robert H NAO, Badger, Hank (MRC)

The VMRC response provides the necessary documentation regarding their 10-2003 permit that I reference in my response below, but there is not enough detail in the Corps response (i.e. project name, permit references, project scope, etc.) for me make the same conclusion.

Sheri Kattan
Team Leader/Project Manager
Virginia Water Protection Permit Program
DEQ - Tidewater Regional Office
5636 Southern Blvd.
Virginia Beach, VA 23462
Phone 757-518-2156/Fax 757-518-2009
sheri.kattan@deq.virginia.gov

From: Bundick, Joshua A. (WFF-2500) [mailto:joshua.a.bundick@nasa.gov]
Sent: Thursday, May 09, 2013 10:29 AM
To: Kattan, Sheri (DEQ)
Cc: Fisher, John (DEQ); Cole, Robert H NAO; Badger, Hank (MRC)
Subject: Re: FCD for Wallops Shoreline Repair (DEQ 13-046F)

Thanks Sheri for the quick reply. The Corps and VMRC responses are attached.

In consideration of the attached, it appears that no additional DEQ authorization would be needed for the proposed renourishment and repair. Can you please confirm this for us. Thanks.

Josh

Joshua Bundick
Lead, Environmental Planning
NASA Wallops Flight Facility
Wallops Island, VA 23337
O: (757) 824-2319
F: (757) 824-1819
Joshua.A.Bundick@nasa.gov

From: <Kattan>, "Sheri (DEQ)" <Sheri.Kattan@deq.virginia.gov>
Date: Thursday, May 9, 2013 10:07 AM
To: "Bundick, Joshua A. (WFF-2500)" <Joshua.A.Bundick@nasa.gov>
Cc: "Fisher, John (DEQ)" <John.Fisher@deq.virginia.gov>, "Cole, Robert H NAO" <Robert.H.Cole@usace.army.mil>, "Badger, Hank (MRC)" <Hank.Badger@mrc.virginia.gov>
Subject: RE: FCD for Wallops Shoreline Repair (DEQ 13-046F)

Hi Joshua,

Our existing waiver is tied to activities authorized by the Corps and VMRC permits associated with

JPA#10-2003. If the Corps and VMRC have provided you written documentation that your proposed post-Sandy re-nourishment is covered under their 10-2003 respective permit authorizations, then our waiver is also still valid. If they require submittal of a new application and/or issuance of a new permit for the proposed activities, then we will need to re-evaluate the project and determine the appropriate permit action.

Thanks for checking with us and if you need any further clarification, do not hesitate to contact me.

Sincerely,

Sheri Kattan
Team Leader/Project Manager
Virginia Water Protection Permit Program
DEQ - Tidewater Regional Office
5636 Southern Blvd.
Virginia Beach, VA 23462
Phone 757-518-2156/Fax 757-518-2009
sheri.kattan@deq.virginia.gov

From: Bundick, Joshua A. (WFF-2500) [mailto:joshua.a.bundick@nasa.gov]
Sent: Thursday, May 09, 2013 9:53 AM
To: Kattan, Sheri (DEQ); Badger, Hank (MRC)
Cc: Fisher, John (DEQ); Cole, Robert H NAO
Subject: FCD for Wallops Shoreline Repair (DEQ 13-046F)
Importance: High

Hello,

After reading the state's Federal Consistency response to our proposed Post-Sandy Shoreline Repair project at Wallops Island, I was hoping that you could could clarify a couple items....

1. DEQ-TRO's requirements 1(c) and conclusions 1(e) state that we should submit a Joint Permit Application to VMRC and that NASA should obtain the appropriate VWPP authorization and comply with that authorization.
2. VMRC's findings 2(b) do not indicate the need to submit a JPA for the proposed renourishment.

Requested Point to Clarify: For the initial 3.2 million cubic yard initial beach fill, DEQ waived its permitting authority for the project given that the Corps and VMRC were issuing permits to afford adequate protection of water quality. See attached letter. In the case of this proposed renourishment, both the Corps and VMRC have already provided written concurrence that all proposed work is within the scope of existing, valid authorizations (10-2003). In light of this, is there still a need to submit a JPA, and if so, does DEQ plan to re-assess its waiver position?

Thanks,

Josh

Joshua Bundick
Lead, Environmental Planning

Page 2 of 3

Document 009
Virginia Department of Environmental Quality
May 20, 2013

Subject: RE: Hurricane Sandy (UNCLASSIFIED)
Date: Monday, May 20, 2013 10:40:22 AM ET
From: Kattan, Sheri (DEQ)
To: Cole, Robert H NAO
CC: Bundick, Joshua A. (WFF-2500)

Thanks Robert, that was the message I had received before. I was just trying to confirm that that message was related to the Corps permit NAO-1992-1455 (VMRC 10-2003). As long as the work is covered under that permit (which we waived on), Joshua, you are good to go and our waiver still stands.

Sheri Kattan
Team Leader/Project Manager
Virginia Water Protection Permit Program
DEQ - Tidewater Regional Office
5636 Southern Blvd.
Virginia Beach, VA 23462
Phone 757-518-2156/Fax 757-518-2009
sheri.kattan@deq.virginia.gov

-----Original Message-----
From: Cole, Robert H NAO [mailto:Robert.H.Cole@usace.army.mil]
Sent: Monday, May 20, 2013 10:24 AM
To: Kattan, Sheri (DEQ)
Cc: Bundick, Joshua A. (WFF-2500)
Subject: FW: Hurricane Sandy (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Sheri,

Here is the determination that NASA's Sandy beach restoration project is covered by the original permit.

Robert Cole
Eastern Virginia Regulatory Section
PO Box 125
Greenbackville, VA 23356
(757) 903- 1562

-----Original Message-----
From: Cole, Robert H NAO
Sent: Thursday, February 07, 2013 9:14 AM
To: 'Bundick, Joshua A. (WFF-2500)'
Cc: Baggett, Kimberly A NAO; Gibson, Steven W NAO
Subject: RE: Hurricane Sandy (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Josh,

The original permit for the Beach Project is still active. I did not see any issues with NASA repairing the beach

THIS PAGE INTENTIONALLY LEFT BLANK

Document 010
National Aeronautics and Space Administration
May 28, 2013

National Aeronautics and
Space Administration

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

Reply to Attn of: 228

May 28, 2013

Mr. George H. Badger
Environmental Engineer
Virginia Marine Resources Commission
2600 Washington Avenue, 3rd Floor
Newport News, Virginia 23607

Mr. Robert Cole
Environmental Scientist
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510

Dear Sirs:

This letter is intended to provide the National Aeronautics and Space Administration's (NASA's) official request for a permit modification from both the Virginia Marine Resources Commission (VMRC) and the U.S. Army Corps of Engineers (USACE) Regulatory Program.

Since obtaining permits from both agencies (VMRC #10-2003) and conducting the initial 3.2 million cubic yard beachfill and seawall extension in 2011 and 2012, Wallops Island has sustained notable storm damage, particularly from Hurricane Sandy in October 2012. To that end, NASA is currently proposing to renourish the beach and repair the southernmost section of its seawall in the coming year. The proposed shoreline repair was the subject of an April 2013 Draft Environmental Assessment that your agencies recently reviewed.

In consideration of the storm damage incurred during Hurricane Sandy, the project design team has recommended elevating the beach berm by an additional foot, which would change the berm's design template from +6 North American Vertical Datum of 1988 (NAVD '88) to +7 NAVD '88. A design drawing reflecting this change is enclosed. Aside from this modification, the design would not change from what is currently on file with VMRC and USACE. Of note is the fact that because the beach fill material has proven to be somewhat coarser than originally estimated, despite the proposed increase in berm elevation, the resultant steeper slope of the shoreface (>20:1) would keep the proposed footprint within the extent that has already been permitted.

2

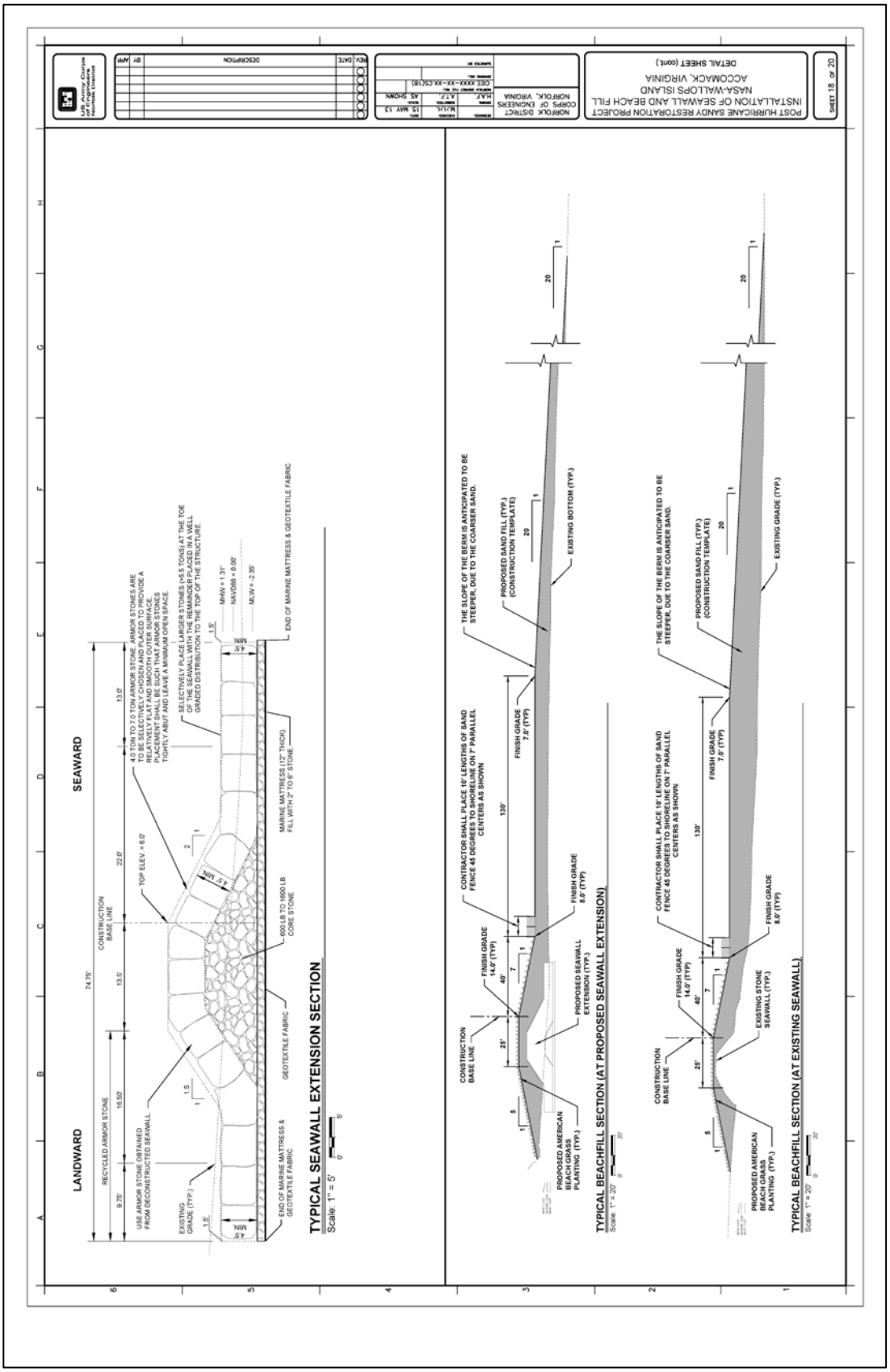
Our initial discussions with you on this subject indicate that such a modification could be processed administratively and that this request is all you need from us. If this assumption has changed, we would appreciate your timely notification.

Thank you for your consideration of our request. Please contact me at (757) 824-1168 or Paul.C.Bull@nasa.gov if you have any questions or require additional information.

Sincerely,

Paul C. Bull, P.E.
Project Manager

Enclosure


POST HURRICANE SANDY RESTORATION PROJECT
INSTALLATION OF SEAWALL AND BEACH FILL
NASA-WALLOPS ISLAND
ACCOMACK, VIRGINIA
DETAIL SHEET (cont.)
SHEET 18 of 20
NORFOLK DISTRICT
CORPS OF ENGINEERS
NORFOLK, VIRGINIA
LANDWARD
SEAWARD
RECYCLED ARMOR STONE
CONSTRUCTION BASE LINE
USE ARMOR STONE OBTAINED FROM DECONSTRUCTED SEAWALL
EXISTING GRADE (TYP.)
TOP ELEV = 6.0'
4.0 TON TO 7.0 TON ARMOR STONE. ARMOR STONES ARE TO BE SELECTIVELY CHOSEN AND PLACED TO PROVIDE A REGULAR, UNIFORM, FLAT AND SMOOTH SURFACE. STONE PLACEMENT SHALL BE SUCH THAT ARMOR STONES TIGHTLY ABUT AND LEAVE A MINIMUM OPEN SPACE.
SELECTIVELY PLACE LARGER STONES (>5.5 TONS) AT THE TOE OF THE SEAWALL WITH THE REMAINDER PLACED IN A WELL GRADED DISTRIBUTION TO THE TOP OF THE STRUCTURE.
MHW = 1.31'
NAVD88 = 0.00'
MLW = -2.35'
END OF MARINE MATTRESS & GEOTEXTILE FABRIC
MARINE MATTRESS (12" THICK) FILL WITH 2" TO 6" STONE
600 LB TO 1600 LB CORE STONE
GEOTEXTILE FABRIC
END OF MARINE MATTRESS & GEOTEXTILE FABRIC
TYPICAL SEAWALL EXTENSION SECTION
Scale: 1" = 5'
THE SLOPE OF THE BERM IS ANTICIPATED TO BE STEEPER, DUE TO THE COARSER SAND.
PROPOSED SAND FILL (TYP.) (CONSTRUCTION TEMPLATE)
EXISTING BOTTOM (TYP.)
CONTRACTOR SHALL PLACE 10' LENGTHS OF SAND FENCE 45 DEGREES TO SHORELINE ON 7' PARALLEL CENTERS AS SHOWN
FINISH GRADE 7.0' (TYP)
FINISH GRADE 14.0' (TYP)
FINISH GRADE 8.0' (TYP)
PROPOSED SEAWALL EXTENSION (TYP.)
PROPOSED AMERICAN BEACH GRASS PLANTING (TYP.)
TYPICAL BEACHFILL SECTION (AT PROPOSED SEAWALL EXTENSION)
Scale: 1" = 20'
EXISTING GRADE (TYP.)
EXISTING STONE SEAWALL (TYP.)
TYPICAL BEACHFILL SECTION (AT EXISTING SEAWALL)
Scale: 1" = 20'

THIS PAGE INTENTIONALLY LEFT BLANK

Document 011
Virginia Marine Resources Commission
June 11, 2013

COMMONWEALTH of VIRGINIA

Marine Resources Commission
2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

Douglas W. Domenech
Secretary of Natural Resources

Jack G. Travelstead
Commissioner

June 11, 2013

Mr. Paul Bull, P.E., Project Manger
c/o National Aeronautics and Space Administration
Wallops Flight Facility
Building N-161, Code 228
Wallops Island, VA 23337

Re: VMRC #10-2003

Dear Mr. Bull:

In accordance with your letter dated May 28, 2013, this is to authorize a modification to your above referenced permit which was originally issued by the Marine Resources Commission on February 22, 2011.

The authorized modification will increase the beach elevation from six (6.0) feet to seven (7.0) feet (NAVD 88). As stated in your request the resulting subaqueous slope will still be within the permitted footprint. All other conditions of your permit shall remain unchanged.

Please attach this letter and the revised drawing dated received June 3, 2013, to your previously issued permit as evidence of the authorization contained herein.

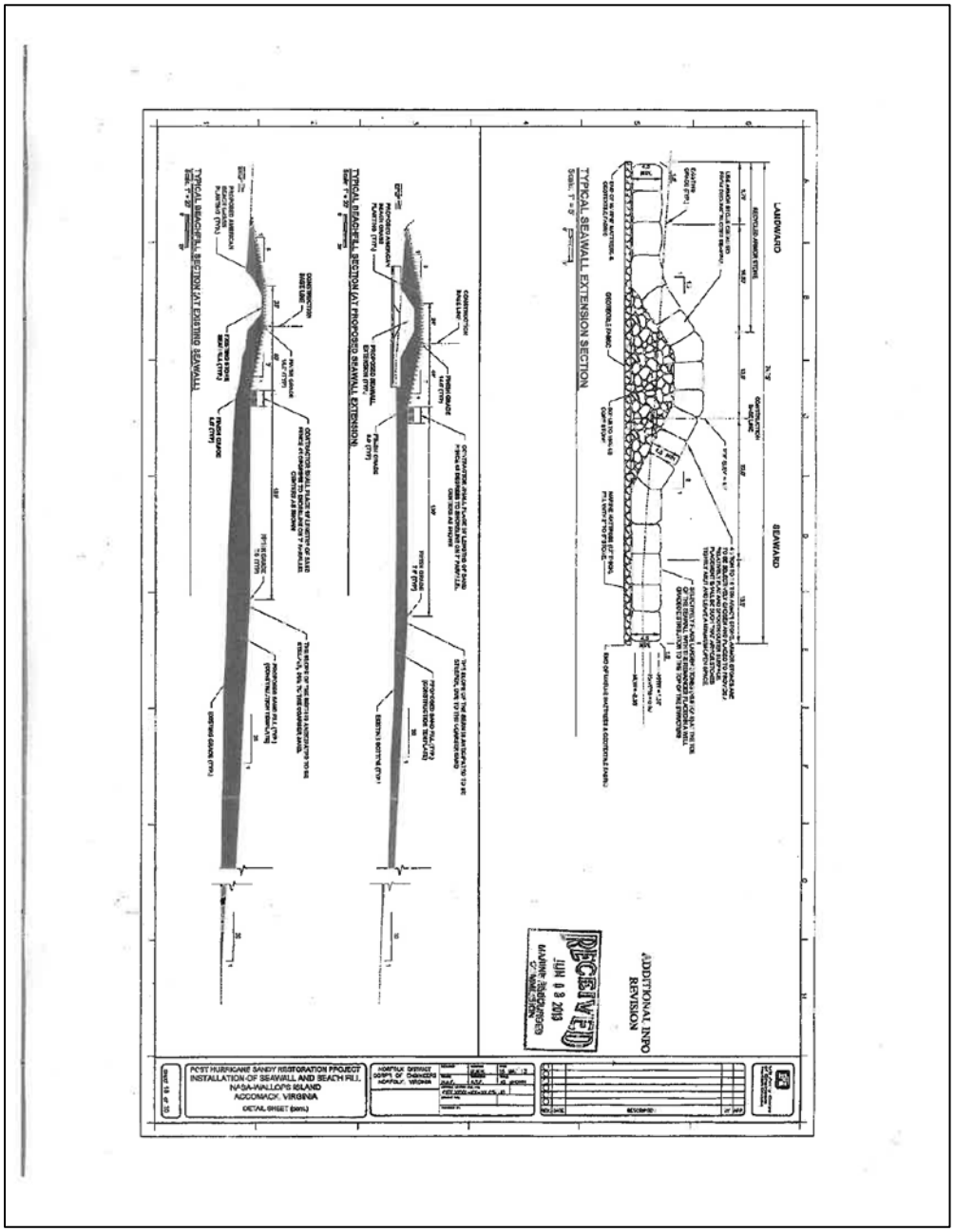
Should you have any questions regarding this matter, please do not hesitate to contact Mr. Hank Badger of my staff at (757) 414-0710.

Sincerely,

Tony Watkinson
Chief, Habitat Management

TW/ghb:lra
HM
Enclosure
cc: U.S. Army Corps of Engineers #6
Accomack County Wetlands Board

An Agency of the Natural Resources Secretariat
www.mrc.virginia.gov
Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD


LANDWARD
SEAWARD
TYPICAL SEAWALL EXTENSION SECTION
TYPICAL BEACHFILL SECTION (AT PROPOSED SEAWALL EXTENSION)
TYPICAL BEACHFILL SECTION (AT EXISTING SEAWALL)
RECEIVED
JUN 0 9 2013
MARINE RESOURCES COMMISSION
ADDITIONAL INFO
REVISION
POST HURRICANE SANDY RESTORATION PROJECT
INSTALLATION OF SEAWALL AND BEACH FILL
NASA/WALLOPS ISLAND
ACCOMACK, VIRGINIA
DETAIL SHEET (SHTL)
NORFOLK DISTRICT
CORPS OF ENGINEERS
NORFOLK, VIRGINIA

Appendix B

Comments Received on Draft EA

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix B Correspondence Index

DOCUMENT NUMBER	DATE	FROM
001	April 25, 2013	U.S. Army Corps of Engineers
002	April 26, 2013	Catawba Indian Nation
003	April 29, 2013	Bureau of Ocean Energy Management
004[1,2]	May 6, 2013	Virginia Department of Environmental Quality
005	May 10, 2013	U.S. Environmental Protection Agency, Region III
006	May 14, 2013	Pocomoke Indian Nation
007	May 23, 2013	NASA, to Pocomoke Indian Nation
008	June 12, 2013	Pocomoke Indian Nation
009	May 14, 2013	The Nature Conservancy
010	May 14, 2013	U.S. Navy, Fleet Forces Command
011	May 21, 2013	Hampton Roads Military and Federal Facilities Alliance

[1] Comments submitted on behalf of five other Virginia agencies.

[2] Subsequent to submitting its comments via the Virginia Department of Environmental Quality's consolidated state agency response, the Virginia Department of Conservation and Recreation also submitted the same comments in a May 15, 2013 letter. As the comments are the same as those contained within Document 004, they are not included as a separate document in this appendix.

THIS PAGE INTENTIONALLY LEFT BLANK

Document 001
U.S. Army Corps of Engineers
April 25, 2013

Monday, April 29, 2013 8:58:21 AM ET

Subject: Wallops Island Dradt EA for Sandy Repairs (UNCLASSIFIED)
Date: Thursday, April 25, 2013 1:18:58 PM ET
From: Cole, Robert H NAO
To: Bundick, Joshua A. (WFF-2500), Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)], Turner, Carolyn (WFF-2500)
CC: Petrow, Carol, Alaina DeGeorgio, Sheri Kattan, Gibson, Steven W NAO

Classification: UNCLASSIFIED
Caveats: NONE

Josh,

I have reviewed the Draft EA for the beach repairs proposed for the Wallops Island Beach. I only have two questions:

1. Section 3.4 Cumulative Impacts.
Several projects have been singled out in the draft EA. Per Norfolk District Design-Build bid solicitation, and FHA bridge replacement bid solicitation, there are additional impacts being considered that would affect the cumulative impacts presented by the draft EA. The above mentioned projects are linked to this draft EA via flight operations at Launch Pads A and B, which the proposed beach project is designed to protect. Are there any other projects, past present, or in the foreseeable future that may be affected by the proposed beach repair project? 1

2. Section 3.2 Biological Environment
3.2.2.1 Affected Environment.
The draft EA states that "an expansive area of tidal pools" has developed on the northern end of the project site. Since the pools now serve as an "important source of forage for avian species," how will this area be incorporated into planning for future dredging cycles? Has the development of the tidal pools significantly altered jurisdictional waters or habitats for endangered or threatened species within areas where future projects are under consideration (UAS Airstrip)? 2

Please contact me directly if you wish to discuss my questions.

Robert Cole
Eastern Virginia Regulatory Section
PO Box 125
Greenbackville, VA 23356
(757) 903- 1562

Classification: UNCLASSIFIED
Caveats: NONE

Page 1 of 1

Response to Comment 1: A key aspect of considering cumulative effects under NEPA is to identify actions other than the Proposed Action affecting the same resources as the Proposed Action, therefore presenting the potential for additive effects. In doing so, both temporal and spatial analysis boundaries must be established.

Response to Comment 1 (cont.): Of the two projects mentioned, the first would involve construction of a new launch command center on an upland site in the central campus portion of the WFF Main Base, approximately 6 miles north of the area that would be affected by the Proposed Action. As such, there would be no spatial overlap with resources affected by the Proposed Action. The second project would involve repairs to the existing Wallops Island causeway bridge, none of which are expected to require any in-water work or measurably affect resources also affected by the Proposed Action. Consequently, neither project has been included in the Cumulative Effects section of this EA. However, a reasonably foreseeable future action, the U.S. Navy's proposed powder gun/railgun program on Wallops Island, has been added to the analysis.

Response to Comment 2: NASA would continue to monitor the Wallops Island beach in accordance with its Protected Species Monitoring Program. The results of these surveys would be considered when planning future beach renourishment cycles.

Consistent with its obligations under both NEPA and the Endangered Species Act, should the subject area change in a way that could substantially affect the conclusions drawn in existing environmental impact assessment documents, NASA would re-assess its operations and conduct additional resource consultations, as appropriate.

Document 002
Catawba Indian Nation
April 26, 2013

Subject: Post-Hurricane Sandy Shoreline Repair
Date: Friday, April 26, 2013 1:28:03 PM ET
From: Caitlin Haire
To: Bundick, Joshua A. (WFF-2500)

Mr. Bundick,

We have no concerns with this project at this time. If you need anything else let me know. Thanks | 1

Caitlin

--
Caitlin Totherow
Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, SC 29730

803-328-2427 ext. 226
Caitlinh@ccppcrafts.com

Please Note: We CANNOT accept Section 106 forms via e-mail, unless requested. Please send us hard copies. Thank you for your understanding

Response to Comment 1: NASA notes that the Catawba Indian Nation does not have concerns with the proposed project.

THIS PAGE INTENTIONALLY LEFT BLANK

Document 003
Bureau of Ocean Energy Management
April 29, 2013

United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

APR 29 2013

Mr. Joshua Bundick
National Aeronautics and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Mailstop: 250.W
Wallops Island, Virginia 23337

Dear Mr. Bundick:

Thank you for your April 5, 2013, letter notifying the Bureau of Ocean Energy Management (BOEM) of the availability of the Draft Environmental Assessment (DEA) for National Aeronautics and Space Administration's (NASA) proposed Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program at Wallops Flight Facility, Wallops Island, Virginia. The proposed action may include the implementation of a beach nourishment project along the length of Wallops Island using sand resources obtained from the adjacent Outer Continental Shelf.

As a cooperating agency on this project, BOEM welcomes the opportunity to participate in the National Environmental Policy Act effort. BOEM has reviewed the April 2013 DEA prepared by NASA for the proposed project and has no additional comments. 1

The BOEM looks forward to working with NASA during this process and appreciates the collaborative effort by NASA. If you would like to discuss any of these items further, please contact Jennifer Culbertson at (703) 787-1742 or by e-mail at Jennifer.Culbertson@boem.gov.

Sincerely,

Geoffrey Wikel
Chief, Branch of Environmental Coordination
Division of Environmental Assessment

cc: Ms. Colleen Finnegan, BOEM, Leasing Division

Mr. George Mears, USACE, Civil Works

Mr. Robert Cole, USACE, Regulatory

Response to Comment 1: NASA notes that BOEM does not have additional comments on the Draft EA.

THIS PAGE INTENTIONALLY LEFT BLANK

Document 004
Virginia Department of Environmental Quality
May 6, 2013

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

May 6, 2013

Mr. Joshua A. Bundick
WFF NEPA Manager
Environmental Office
NASA Wallops Flight Facility
Wallops Island, Virginia 23337

RE: Draft Environmental Assessment and Federal Consistency Determination for the Wallops Island Post-Hurricane Sandy Beach Renourishment, Accomack County, (DEQ 13-046F).

Dear Mr. Bundick:

The Commonwealth of Virginia has completed its review of the April 3013 Draft Environmental Assessment (EA) (received April 9, 2013) and March 8, 2013 Federal Consistency Determination (FCD) (received March 12, 2013) for the Wallops Island post-hurricane Sandy beach renourishment project at the Goddard Space Flight Center, Wallops Flight Facility in Accomack County. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents submitted under the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating Virginia's review of FCDs submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. The following agencies participated in the review of the EA and FCD for this proposal:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Game and Inland Fisheries
Virginia Marine Resources Commission
Department of Health
Department of Historic Resources

In addition, the Department of Agriculture and Consumer Services, Department of Mines, Minerals and Energy, Virginia Institute of Marine Science, Accomack County and Accomack-Northampton Planning District Commission were invited to comment on the proposal.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

PROJECT DESCRIPTION

The National Aeronautics and Space Administration (NASA) proposes to renourish the beach at the Goddard Space Flight Center, Wallops Flight Facility (WFF) on Wallops Island in Accomack County. The project includes the dredging and placement of up to 800,000 cubic yards (CY) of sand from an offshore borrow area (Unnamed Shoal A) using one or more trailing suction hopper dredge(s) to obtain the material. This would require one or more anchored pumpout station(s) approximately two miles east of Wallops Island in 25-30 feet of water. Up to several miles of submerged steel pipeline would be temporarily placed on the seafloor and would be the conduit by which the sand/water slurry would be pumped from the dredge to the beach. Once discharged onto the beach, mechanized equipment (e.g., bulldozers) would grade the material to the design template. The linear extent of the proposed beach fill would be approximately 2.3 miles between the Z-100 camera stand on the south up to just beyond the Horizontal Integration Facility located mid-island. Following beach fill, NASA would re-plant the dunes with native vegetation and install sand fencing to trap windblown sand. It is expected that the dredging and beach fill work would take between 1.5-3 months to complete. Depending upon the amount of funding available for the project, NASA may further extend its rock seawall to the south.

A Programmatic Environmental Impact Statement (PEIS) for the Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program was completed in December 2010 to assess the environmental consequences from a 50-year design life storm damage reduction program at WFF. The commonwealth responded to both the draft and final PEIS in April 2010 (DEQ 10-019F) and November 2010 (DEQ 10-156F), respectively. The document describes an initial beach fill cycle followed by an estimated nine renourishment cycles to maintain a target level of storm damage reduction. Consistent with the NEPA approach outlined for the PEIS, NASA has prepared this EA as a tiered document focusing specifically on the proposed renourishment and seawall repair. As such, much of the PEIS is incorporated by reference with new information and analysis provided as appropriate.

CONCLUSION

Based on the information provided in the Draft Environmental Assessment and comments from reviewers, the Commonwealth of Virginia has no objections to the proposal as presented. Provided activities are performed in compliance with all applicable laws and regulations and in accordance with the recommendations which follow, this project is unlikely to have significant effects on ambient air quality, water quality, surface waters, groundwater, wetlands, fisheries, forest resources, agricultural land or historic resources. It will not affect species of animals or insects listed by state agencies as rare, threatened, or endangered. 1

2

Response to Comment 1: NASA notes that the Commonwealth of Virginia has no objections to the proposed project. NASA would ensure that all project activities are performed in compliance with applicable Federal, state, and local regulations.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Surface Waters and Wetlands. According to the EA (page 3-10), dredging operations and sand placement would cause sediment to be suspended in the water column. The sediment plume from the dredge and the turbidity plume generated at the placement site would be expected to dissipate approximately 1,640-4,000 feet from the dredge and between 1,000-2,000 feet alongshore and lasting one to several hours. The document does not indicate what wetlands would be impacted by the proposed action. 2

1(a) Agency Jurisdiction. The State Water Control Board (SWCB) promulgates Virginia's water regulations, covering a variety of permits to include Virginia Pollutant Discharge Elimination System (VPDES) Permit, Virginia Pollution Abatement Permit, Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection Permit (VWPP). The VWPP is a state permit which governs wetlands, surface water, and surface water withdrawals/impoundments. It also serves as § 401 certification of the federal *Clean Water Act* § 404 permits for dredge and fill activities in waters of the U.S. The VWPP Program is under the Office of Wetlands and Water Protection/Compliance, within the DEQ Division of Water Quality Programs. In addition to central office staff that review and issue VWP permits for transportation and water withdrawal projects, the seven DEQ regional offices perform permit application reviews and issue permits for the covered activities.

1(b) Agency Findings. According to the VWPP program at the DEQ Tidewater Regional Office, the proposed beach nourishment project involves activities regulated by the VWPP program. 3

1(c) Requirements. A Joint Permit Application (JPA) should be submitted to the Virginia Marine Resources Commission for dissemination to the appropriate regulatory agencies.

1(d) Recommendations. In general, DEQ recommends that surface water and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the following practices:

- Use directional drilling from upland locations for stream crossings, to the extent practicable. If directional drilling is not feasible, stockpile the material excavated from the trench for replacement. 4
- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable;

3

Response to Comment 2: There would be no impacts to vegetated wetlands.

Response to Comment 3: Subsequent discussion with permitting agencies, including DEQ, VMRC, and USACE (included in Appendix A) indicate that submitting a JPA for the proposed project would not be required. Additionally, according to DEQ, its March 16, 2011 permitting waiver issued for the initial beach fill would apply to the proposed project.

Response to Comment 4: NASA would incorporate those recommended practices that are applicable to a beach nourishment project; specifically bullets 5, 9, and 10 in the provided list.

- Construct trenches in a manner that does not drain the wetlands (for example, backfilling with extensive gravel layers thereby creating a French drain effect).
- Preserve the top 12 inches of trench material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Design erosion and sedimentation controls in accordance with the most current edition of the *Virginia Erosion and Sediment Control Handbook*. These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to State waters. The controls should remain in place until the area is stabilized.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub, or forested). The applicant should take all appropriate measures to promote re-vegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed. 4 (cont.)
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats, geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- Mark or flag all non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading, or filling activities for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Employ measures to prevent spills of fuels or lubricants into state waters.

1(e) Conclusion. The VWPP program at DEQ-TRO concludes that this project will be consistent with VWPP program provided NASA obtains the appropriate VWPP authorization and complies with the conditions of the authorization. 3 (cont.)

For additional information regarding the VWPP program, contact DEQ-TRO, Bert Parolari at (757) 518-2166.

2. Subaqueous Lands, Dunes and Beaches. According to the EA (page 3-12), impacts to state subaqueous lands and dunes (including beaches) are overseen by the Virginia Marine Resources Commission (VMRC). NASA obtained a permit from the

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

agency prior to conducting a beach fill and seawall extension in 2011 and 2012 under the Wallops Flight Facility Shoreline Restoration and infrastructure Protection Program. The VMRC permit (10-2003), which was issued on February 22, 2011 with an expiration date of February 22, 2016, authorizes the proposed beach renourishment activities that are the subject of this review.

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission, pursuant to Section 28.2-1204 of the Code of Virginia, has jurisdiction over any encroachments in, on, or over any state-owned rivers, streams, or creeks in the Commonwealth. For any development that involves encroachments channelward of ordinary high water along natural rivers and streams, a permit is required from VMRC.

The VMRC serves as the clearinghouse for the Joint Permit Application used by the:

- VMRC for encroachments on or over state-owned subaqueous beds as well as tidal wetlands;
- U.S. Army Corps of Engineers (Corps) for issuing permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act;
- DEQ for issuance of a Virginia Water Protection Permit; and
- local wetlands board for impacts to wetlands.

2(b) Agency Findings. VMRC confirms that NASA's existing permit (VMRC #10-2003) gives them the authorization to place sand on the beach on an as needed basis and to install or repair the seawall until February 22, 2016, provide NASA does not exceed the permitted footprint or heights. In addition, the permit includes a renewal provision for an additional five years provided NASA requested the extension prior to February 2016. 5

2(c) Requirement. Should NASA use upland sand instead of material from the permitted dredge site, a permit modification would be required. An in-house modification could be performed provided the material used is >90% sand.

For further information, contact VMRC, George Badger at (757) 414-0710.

3. Air Emissions. According to the EA (page 3-13), the primary emissions from the proposed action would result from the burning of fossil fuels in mobile sources (e.g., dredges, earth moving equipment, etc.). It is not anticipated that these emissions would cause measurable long-term adverse impacts on air quality or climate change.

3(a) Agency Jurisdiction. DEQ's Air Quality Division, on behalf of the State Air Pollution Control Board, is responsible to develop regulations that become Virginia's *Air Pollution Control Law.* DEQ is charged to carry 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

5

Response to Comment 5: NASA notes VMRC's comment that the existing permit would authorize the Proposed Action provided that the project does not exceed the permitted footprint or heights. An upland sand source is not under consideration for the Proposed Action.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

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 regional office is directly responsible for the issue of necessary permits to construct and operate all stationary sources in the region as well as to monitor emissions from these sources for compliance. As a part of this mandate, the environmental documents of new 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.

3(b) Agency Findings. According to the DEQ Air Division, the project site is located in an ozone (O_3) attainment area.

3(c) Recommendation. NASA should take all reasonable precautions to limit emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NO_x), principally by controlling or limiting the burning of fossil fuels. 6

For additional information regarding these comments, contact DEQ-Air, Kotur Narasimhan at (804) 698-4415.

4. Solid and Hazardous Wastes and Hazardous Materials. The EA (page 3-5) notes that the Final PEIS concluded that there would be negligible impacts with respect to hazardous materials and waste.

4(a) Agency Jurisdiction. Solid and hazardous wastes in Virginia are regulated by the Virginia Department of Environmental Quality, the Virginia Waste Management Board (VWMB) and the U.S. Environmental Protection Agency. They administer programs created by the federal Resource Conservation and Recovery Act, Comprehensive Environmental Response Compensation and Liability Act, commonly called Superfund, and the Virginia Waste Management Act. DEQ administers regulations established by the VWMB and reviews permit applications for completeness and conformance with facility standards and financial assurance requirements. All Virginia localities are required, under the Solid Waste Management Planning Regulations, to identify the strategies they will follow on the management of their solid wastes to include items such as facility siting, long-term (20-year) use, and alternative programs such as materials recycling and composting.

4(b) Agency Findings. The DEQ Division of Land Protection and Revitalization (DLPR) (formerly called the Waste Division) finds that neither solid and nor hazardous waste issues were addressed in the report. In addition, the EA did not include a search of waste-related data bases. DLPR staff performed a cursory review of DEQ data files and determined that there are several hazardous and formerly used defense sites 7

6

Response to Comment 6: NASA would recommend that its contractors take all reasonable measures to limit emissions of VOCs and NO_x.

Response to Comment 7: Sections 3.1.11, 3.1.12, 4.2.9, and 4.2.10 of the *Final PEIS* describe in detail the solid and hazardous waste issues associated with shoreline repair work, including the Proposed Action. Given that there would be negligible effects on these resource areas, a detailed discussion is not provided in this EA.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

(FUDS) located within the same zip code, however their proximity to the subject site is unknown. A list of these sites is included in the DLPR comments attached to this response. 7 (cont.)

4(c) Requirements.

(i) Hazardous Waste Management

Any soil that is suspected of contamination or wastes that are generated during construction must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations. Any construction or demolition debris must be characterized in accordance with the *Virginia Hazardous Waste Management Regulations* and disposed of at an appropriate facility.

(ii) Asbestos-containing Material and Lead-based Paint 8

Any structures being demolished or 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 9 VAC 20-80-640 for ACM and 9 VAC 20-60-261 for LBP must be followed.

4(d) Recommendations.

(i) Additional Waste Site Information

The following website may be accessed to locate additional information on listed waste sites using their identification numbers:

http://www.epa.gov/superfund/sites/cursites/index.htm or
http://www.epa.gov/enviro/html/rcris/rcris_query_java.html.

(ii) Pollution Prevention

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. 8 (cont.)

For additional information regarding waste comments, contact DEQ-DLPR, Steve Coe at (804) 698-4029.

7

Response to Comment 7 (cont.): Regarding the FUDS sites in the vicinity of the project area: During the initial fill cycle, Munitions and Explosives of Concern (MEC) were not encountered either at the offshore borrow area or along the Wallops Island beach. Accordingly, it is unlikely that MEC would be found while conducting the proposed repair work. However, as a best management practice and consistent with Section F.3 of its *Record of Decision* for the *Final PEIS*, NASA would ensure that its contractors performing the work are made aware of both the potential for encountering MEC and the reporting protocol should any be discovered.

Response to Comment 8: NASA would ensure that all project-related wastes are managed in accordance with applicable Federal, state, and local regulations.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

5. Petroleum Storage Tanks. If the construction of this project will include the use of portable ASTs (>660 gallons) for more than 120 days, it must be registered with DEQ-TRO using AST Registration form 7540-AST. This form is available at the DEQ web site at www.deq.virginia.gov. 9

6. Natural Heritage Resources. The EA does not specifically discuss project impacts to natural heritage resources. 10

6(a) Agency Jurisdiction.

(i) Department of Conservation and Recreation

The mission of the Virginia Department of Conservation and Recreation is to conserve Virginia's natural and recreational resources. DCR supports a variety of environmental programs organized within seven divisions including the Division of Natural Heritage. The Natural Heritage Program's (DCR-DNH) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The *Virginia Natural Area Preserves Act*, 10.1-209 through 217 of the *Code of Virginia*, was passed in 1989 and codified DCR's powers and duties related to statewide biological inventory: maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (the habitats of rare, threatened, and endangered species, significant natural communities, geologic sites, and other natural features).

(ii) Department of Agriculture and Consumer Services

The Endangered Plant and Insect Species Act of 1979, Chapter 39, §3.1-102- through 1030 of the *Code of Virginia*, as amended, authorizes the Virginia Department of Agriculture and Consumer Services (VDACS) to conserve, protect and manage endangered species of plants and insects. The VDACS Virginia Endangered Plant and Insect Species Program personnel cooperates with the U.S. Fish and Wildlife Service, DCR-DNH and other agencies and organizations on the recovery, protection or conservation of listed threatened or endangered species and designated plant and insect species that are rare throughout their worldwide ranges. In those instances where recovery plans, developed by the U.S. Fish and Wildlife Service, are available, adherence to the order and tasks outlines in the plans are followed to the extent possible.

6(b) Agency Findings.

(i) Assawoman Island Conservation Site

According to the information currently in DCR-DNH files, the Assawoman Island 10 (cont.)

8

Response to Comment 9: NASA would require that its contractors register with DEQ portable fuel tanks with capacities greater than 660 gallons if it is likely that they would be onsite for more than 120 days.

Response to Comment 10: As a component of its Protected Species Monitoring Program, NASA performs regular surveys of the Wallops Island beach to identify sea turtle nesting activity. Section 3.2.5.2 of this EA describes the levels of recent loggerhead sea turtle activity within and adjacent to the project site while Section 3.2.5.3 describes potential effects of the Proposed Action.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

Conservation Site is located in the project vicinity. 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 based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Assawoman Island Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern at this site is:

Caretta caretta	Loggerhead sea turtle	G3/S1B,S1N/LE/LT

The loggerhead is a cosmopolitan sea turtle which nests regularly in small numbers in Virginia. Loggerheads mate from late March to early June. From late April to early September, females make their way to shore to dig nests on ocean beaches, generally preferring high energy, relatively narrow, steeply sloped, coarse-grained beaches. Though thousands of eggs may be laid, only a few individuals are believed to survive to adulthood. This species is classified as endangered by the United States Fish and Wildlife Service (USFWS) and as threatened by the Virginia Department of Game and Inland Fisheries. 10 (cont.)

Loggerheads face threats both in the marine environment and on nesting beaches. The greatest cause of decline and the continuing primary threat to loggerhead turtle populations worldwide is incidental capture in fishing gear, primarily in longlines and gillnets, but also in trawls, traps and pots, and dredges (USFWS, 2005). On land, loggerheads face threats from habitat loss and alteration (primarily development of beaches, dredging, riprap, groins and jetties etc), increased nest predation by raccoons and feral animals, trampling by foot and vehicle traffic, and beachfront lighting which may affect hatchlings from reaching the ocean (NatureServe, 2009).

(ii) Threatened and Endangered Plant and Insect Species

VDACS has regulatory authority to conserve rare and endangered plant and insect species through the Virginia Endangered Plant and Insect Species Act. Under a Memorandum of Agreement established between VDACS and DCR, DCR has the authority to report for VDACS on state-listed plant and insect species. According to DCR-DNH, there is the potential for the seabeach amaranth (*Amaranthus pumilus*, G2/S1/LT/LT) to occur within the project area if suitable habitat exists on site. Seabeach amaranth is a diminutive annual with green, relatively orbicular, fleshy leaves and reddish, fleshy stems. When seen in its barren beach foredune habitat, only the leafy tips of the plants project above the sand and any further growth is often prostrate, 11

9

Response to Comment 11: The commenter correctly notes that there is suitable habitat for seabeach amaranth within the area potentially affected by the Proposed Action. As a component of its Protected Species Monitoring Program, NASA performs annual seabeach amaranth surveys of the Wallops Island beach during the suggested late summer/early fall timeframe. Since beginning the regular surveys in 2010, no seabeach amaranth has been identified on Wallops Island. Text has been added to Section 3.2.5.2 of this EA to clarify this point, however detailed discussion of potential effects is not presented in this EA due to the documented absence of the species.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

leading to the formation of low mats when several plant occur. This globally rare species was originally known from maritime sand ranging from southern Massachusetts to South Carolina but is presently known from only two-thirds of its former range due to such threats as shoreline hardening, construction, and off-road vehicle traffic. It was last seen on the Virginia barrier islands in 1972 but was rediscovered during the 2004 growing season on Assateague Island by National Park Service personnel.

Seabeach amaranth habitat is fairly unusual since it is mostly found just ocean-ward of dunes, in an area nearly devoid of vegetation and subjected to violent wave action and storm overwash. This most likely indicates the species is a poor competitor, much like two of Virginia's state- and globally-rare plant species found on beaches: *Chamasesyce bombensis*, (G4G5/S2/NL/NL) and *Polygonum glaucum*, (G3/S1S2/NL/NL). 11 (cont.)

Sea-beach amaranth should be surveyed for from July 1-September 30 when the plant is flowering/fruiting. However, weather conditions in any given year may lengthen or shorten this survey period.

***(iii)* State Natural Area Preserves**

DCR files do not indicate the presence of any State Natural Area Preserves under the agency's jurisdiction in the project vicinity.

6(c) Recommendations.

(i) Loggerhead Sea Turtle

Due to the potential for this site to support populations of the loggerhead sea turtle, DCR-DNH recommends an inventory for sea turtle nests in the study area. With the survey results DCR-DHN can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. DCR-DNH biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS. 10 (cont.)

(ii) Seabeach Amaranth

Due to the potential for this site to support populations of the seabeach amaranth, DCR-DNH recommends an inventory for the plant in the study area. With the survey results DCR-DHN can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. Survey results should be coordinated with DCR-DNH and USFWS. Upon review of the results, if it is determined the species is present, and there is a likelihood of a negative impact on the species, DCR-DNH will recommend coordination with VDACS to 11 (cont.)

10

Response to Comment 11 (cont.): Should the commenter desire additional information regarding the potential effects of beach renourishment on seabeach amaranth if it were present within the action area, please see Section 4.3.10 of the *Final PEIS* and the July 2010 USFWS-issued Programmatic Biological Opinion (Appendix D of the *Final PEIS*).

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

ensure compliance with Virginia's Endangered Plant and Insect Species Act.

(iii) Natural Heritage Resource Information

NASA should contact DCR-DNH to secure updated information on natural heritage resources if a significant amount of time passes before it is utilized. New and updated information is continually added to the Biotics Data System.

7. Wildlife Resources and Protected Species. According to the EA (page 3-21), due to the uncertainty in potential avian use (and potential effects) during the proposed repairs, if work were to be conducted between the months of April and September, NASA would ensure that the work site and adjacent areas are surveyed for nesting by a biological monitor on a daily basis. To mitigate potential impacts to the diamondback terrapin, NASA's biological monitor would report any known areas of concentrated nesting to construction personnel such that they could be avoided until the turtles have moved from the immediate area.

7(a) Agency Jurisdiction. The Department of Game and Inland Fisheries (DGIF), 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). The DGIF is a consulting agency under the *U.S. Fish and Wildlife Coordination Act* (16 U.S.C. sections 661 *et seq.*), and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

7(b) Agency Findings. DGIF notes that the site of beach nourishment is within the project area for the previously reviewed and approved Shoreline Restoration and Infrastructure Protection Project (SRIPP). DGIF finds that it appears the same protocols will be followed for this post-hurricane beach nourishment as for that performed during the SRIPP. As DGIF noted in its review of the SRIPP PEIS, a number of state and federal-listed wildlife and the resources upon which they depend are located from the project area. 12

7(c) Conclusion. DGIF concurs with the proposed work to be performed assuming the beach nourishment adheres to all time-of-year restrictions, monitoring requirements, required buffers, and/or other actions determined necessary for the protection of listed birds and herpetofauna known from the site and associated waters.

For additional information, contact DGIF, Amy Ewing at (804) 347-2211.

11

Response to Comment 12: NASA notes DGIF's concurrence with the proposed work. NASA would adhere to all biological mitigation and monitoring protocols established for the *Final SRIPP PEIS*.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

8. Public Water Supply.

8(a) Agency Jurisdiction. The Virginia Department of Health (VDH), Office of Drinking Water (ODW), reviews projects for the potential to impact public drinking water sources (groundwater wells and surface water intakes).

8(b) Agency Findings. VDH-ODW finds that there are no groundwater wells within a 1 mile radius of the project site. In addition, there are no surface water intakes in Zone 1 (within a 5 mile radius) of the project site. 13

8(c) Conclusion. VDH-ODW concludes that there are no apparent impacts and the project appears to be consistent with the Virginia *Waterworks Regulations*.

Contact VDH, Edward Albrecht at (804) 864-7495 for additional information.

9. Historic and Archaeological Resources. According to the EA (page 3-31), all dredging and sand placement would be conducted within areas previously surveyed for cultural resources. Given the lack of potential resources identified during the surveys, the EA concludes that no archeological resources or aboveground historic properties would be impacted.

9(a) Agency Jurisdiction. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated State's Historic Preservation Office (SHPO), ensures that federal actions comply with Section 106 of the *National Historic Preservation Act of 1966* (*NHPA*), as amended, and its implementing regulation at 36 CFR Part 800. The *NHPA* 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. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding.

9(b) Agency Comments. According to DHR, NASA initiated direct consultation with DHR (February 25, 2013 letter attached) regarding the potential impacts of this project on historic resources. Provided that NASA requires its dredge contractor to follow the conditions detailed in the February 25, 2013 consultation letter, VDH concurs that the proposed undertaking would have no effect on National Register-eligible properties. 14

For additional information, contact DHR, Amanda Lee at (804) 367-2323.

12

Response to Comment 13: NASA notes VDH's comment that there would be no project-related impacts to drinking water sources.

Response to Comment 14: NASA would ensure that its contractors follow the protocols detailed in the February 25, 2013 consultation letter.

Mr. Joshua A. Bundick
Wallops Island Post-Hurricane Sandy Beach Renourishment

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

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 Program (VCP). The VCP consists of a network of programs administered by several agencies. The DEQ coordinates the review of Federal Consistency Determinations with agencies administering the Enforceable and Advisory Policies of the VCP. A FCD dated March 8, 2013 (received March 12, 2013) was submitted for the proposed renourishment project that includes an analysis of the enforceable policies of the VCP.

Pursuant to 15 CFR §930.41(a) DEQ is allowed up to sixty days to conduct a coordinated review and respond to submitted Federal Consistency Determinations. The sixty-day review period for NASA's FCD began on March 12, 2013 and ends on May 10, 2013.

Federal Consistency Public Participation

In accordance with 15 CFR § 930.2, public notice of the proposed action was published on DEQ's web site from March 12, 2013 to April 9, 2013. No public comments were received in response to the notice.

Federal Consistency Analysis

According to information in the FCD, the proposed activity would have no effect on the following enforceable policies: wetlands management; point source pollution control; shoreline sanitation; and coastal lands management. The resource agencies that are responsible for the administration of the enforceable policies of the VCP generally agree with findings of the FCD. The applicant must ensure that the proposed action is consistent with the aforementioned policies. In addition, the document includes a review of potential project impacts to the advisory policies of the VCP. The document finds the proposal consistent with the advisory policies.

Federal Consistency Concurrence

Based on our review of NASA's consistency determination, EA, and the comments and recommendations submitted by agencies administering the enforceable policies of the VCP, DEQ concurs that this proposal is consistent with the VCP provided NASA obtains and complies with all applicable permits or approvals. Also, other state approvals which may apply to this project are not included in this concurrence. 15

13

Response to Comment 15: NASA notes DEQ's concurrence that the proposed project would be consistent with the enforceable policies of the VCP. NASA would obtain and comply with all applicable permits and approvals prior to implementing the Proposed Action.

Therefore, NASA must ensure that this project is constructed and operated in accordance with all applicable federal, state, and local laws and regulations. | 15 (cont.)

REGULATORY AND COORDINATION NEEDS

1. Surface Waters and Wetlands. A Virginia Water Protection Permit may be required for project impacts pursuant to Virginia Code §62.1-44.15:5. Coordination with the appropriate agencies for anticipated impacts is accomplished through the submission of a JPA to VMRC. For additional information regarding the VWPP program, contact DEQ-TRO, Bert Parolari at (757) 518-2166.

2. Air Quality Regulations. Guidance on minimizing the emission of volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) may be obtained from DEQ-TRO, Troy Breathwaite at (757) 518-2006.

3. Solid and Hazardous Wastes. All solid waste, hazardous waste, and hazardous materials must be characterized and managed in accordance with all applicable federal, state, and local environmental 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) (9 VAC 20-60);
- Virginia Solid Waste Management Regulations (VSWMR) (9 VAC 20-80); and
- Virginia Regulations for the Transportation of Hazardous Materials (9 VAC 20-110).

Applicable federal regulations are as follows:

- *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
- *U.S. Department of Transportation Rules for Transportation of Hazardous Materials*, 49 CFR Parts 107, 171.1-172.558.

For additional information, contact DEQ-TRO, Milt Johnston at (757) 518-2151.

3(a) Asbestos-Containing Material. It is the responsibility of the owner or operator of a demolition activity, prior to the commencement of the demolition, to thoroughly inspect the affected part of the facility where the operation will occur for the presence of asbestos, including Category I and Category II nonfriable asbestos containing material (ACM). Upon classification as friable or non-friable, all waste ACM shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9 VAC 20-80-

640), and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9 VAC 20-110-10 *et seq.*). Please contact the DEQ Division of Land Protection and Revitalization, Linda Richardson at (804) 698-4318, and the Department of Labor and Industry, Ronald L. Graham at (804) 371-0444.

3(b) Lead-Based Paint. If applicable, the proposed project must comply with the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations, and with the Virginia Lead-Based Paint Activities Rules and Regulations. For additional information regarding these requirements contact the Department of Professional and Occupational Regulation, David Dick at (804) 367-8588.

4. Storage Tanks. The use of portable fuel AST(s) with a capacity of greater than 660 gallons for more than 120 days will require that the tank(s) are registered with DEQ using *AST Registration Form 7540-AST.* Tank registration may be accomplished by contacting Tom Madigan, DEQ Tidewater Regional Office, at (757) 518-2115 or by e-mail at temadigan@deq.virginia.gov.

5. Natural Heritage Resources. Contact DCR-DNH Natural Heritage Inventory Manager, J. Christopher Ludwig at chris.ludwig@dcr.virginia.gov or (804) 371-6206 to discuss arrangements to conduct an inventory of the loggerhead sea turtle and the seabeach amaranth. A list of other individuals who are qualified to conduct inventories may be obtained by contacting the USFWS Virginia Field Office at (804) 693-6694.

Contact DCR-DNH, Rene Hypes at (804) 371-2708, to secure updated information on natural heritage resources if a significant amount of time passes before the project is implemented, since new and updated information is continually added to the Biotics Data System.

Thank you for the opportunity to review the Draft Environmental Assessment and Federal Consistency Determination for the North Wallops Island Post-Hurricane Sandy Beach Renourishment in Accomack County. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 698-4325 or John Fisher at (804) 698-4339 for clarification of these comments.

Sincerely,

Ellie Irons, Program Manager
Environmental Impact Review

Enclosures

Ec: Cindy Keltner, DEQ-TRO
Steve Coe, DEQ-DLPR
Kotur Narasimhan, DEQ-Air
Tony Watkinson, VMRC
Amy Ewing, DGIF
Robbie Rhur, DCR
Keith Tignor, VDACS
Barry Matthews, VDH
Roger Kirchen, DHR
David Spears, DMME
Pam Mason, VIMS

Cc: Steven Minor, Accomack County
Elaine Meil, Accomack-Northampton PDC

Document 005
U.S. Environmental Protection Agency Region III
May 10, 2013

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

MAY 10 2013

Joshua Bundick
WFF NEPA Manager
National Aeronautics and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

Re: Draft Environmental Assessment (DEA) - Wallops Island Post-Hurricane Sandy Shoreline Repair, Wallops Island, Virginia, April 2013

Dear Mr. Bundick:

In accordance with the National Environmental Policy Act (NEPA) of 1969, the U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment (DEA) for the Wallops Island Post-Hurricane Sandy Shoreline Repair located at the Wallops Flight Facility (WFF), Wallops Island, Virginia. The proposed action evaluated in this EA is the placement of approximately 1 million cubic yards (CY) on the beach shoreline of Wallops Island and complete the seawall extension. The purpose and need of the proposed project is to repair the southern two-thirds of the nourished beach due to sand losses sustained during the October 2012 storm- Hurricane Sandy. The post-storm condition of the beach does not provide the same level of storm damage protection for which it was originally designed.

This EA is a follow up NEPA document to NASA's 2010 Programmatic Environmental Impact Statement (PEIS) for the WFF Shoreline Restoration and Infrastructure Protection Program. The Final PEIS selected Alternative 1, which included the placement of 3.2 million CY dredged from offshore shoal A, as well as an approximately 1,400 feet extension of a rock seawall. Dredging for this activity began in the summer of 2012. The Final PEIS evaluated shoreline nourishment and sea wall extension storm damage reduction project with a 50-year design life. The Final PEIS did not evaluate the potential adverse environmental impacts associated with future renourishment cycles, as future cycles would be evaluated in separate NEPA documents, which were anticipated to occur approximately every five years. EPA provided comments on the 2010 Shoreline Draft PEIS and Final PEIS, expressing concerns about future renourishment cycles, impact and recovery of beach and shoal habitats, potential impacts to rare, threatened or endangered species, and secondary and cumulative impacts. EPA, as well as other interested stakeholders, was concerned about the placement and use of hard structures and the use of north Wallops Island as a potential borrow area, and supported the selection of the beach replenishment only alternative.

We understand that coordination has taken place between NASA WFF and permitting agencies to verify that the currently proposed nourishment cycle of approximately 1 million CY

fits under permits originally issued for the project and does not require new permits. The timing of this action so close to the original work completed in 2012, increasing the frequency of adverse impacts to resources, is of concern to EPA. Upon review of the Draft EA, we remain concerned about the potential impact of future renourishment, impact and recovery of beach and shoal habitats, rare, threatened or endangered species, and cumulative impacts. It may be appropriate to consider if, as was noted in our comment letters on the PEIS, future NEPA study, analysis and documentation of environmental consequences and alternatives for additional shoreline nourishment phases warrants more in-depth assessment, possibly through a Supplemental EIS. This is particularly apparent in light of the unanticipated frequency that may be required to maintain the desired level of storm damage protection. 1

We continue to encourage NASA to receive input from interagency teams and public stakeholders throughout the NEPA process. Thank you for allowing EPA with the opportunity to review and comment on the Draft EA. If you have questions regarding these comments, the staff contact for this project is Alaina McCurdy, at (215) 814-2741. 2

Sincerely,

Barbara Rudnick
NEPA Team Leader
Office of Environmental Programs

Response to Comment 1: NASA notes EPA's concerns regarding the effects of future renourishment cycles. As discussed in the *Final PEIS*, NASA would prepare NEPA documentation for future renourishment actions commensurate with their expected environmental effects, taking into consideration the scope of the proposed project and the extent of resources potentially affected.

Response to Comment 2: NASA will continue to seek input from interagency teams and public stakeholders throughout its NEPA process.

Document 006
Pocomoke Indian Nation
May 14, 2013

POCOMOKE INDIAN NATION
3355 Allen Road – Eden, Maryland 21822

May 14, 2013

Joshua A. Bundick
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

Dear Mr. Bundick:

Wallops Island sits within an area inhabited by Native People called Gingoteague, a band of the Pocomoke Nation. The remnants of the Pocomoke People are focused on preserving their history and culture.

After a review of the Draft Environmental Assessment (DEA) I would like to make the following comments concerning the potential for pre-historical (pre-contact) and historical (post-contact) Native cultural resources within the project area. My comments will be directed toward "cultural resources" in Chapter 3 of the DEA.

The DEA dictates a protocol to cover "unanticipated archaeological resources or remains ... identified during the project", which ensures work stoppage and consultation to determine and document the resource significance, effects of the undertaking of the resource, and avoidance or mitigation measures.

I have not seen within the document any evidence of an archaeological assessment or survey of the shoreline and near shore, post-Hurricane Sandy. Evidence of a Native presence may now be pursued as a consequence of the exposed shoreline and the displacement and replacement of earth, sands, and debris.

It is the view of our People that evidence of Native inhabitation exists in the Wallops Island area; thereby I request to be consulted upon discovery of Native artifacts or remains and further request an archaeological examination and documentation of the post-Hurricane Sandy shore and near shore area prior to commencement of the "Shoreline Repair" 1

Please advise as efforts are made to address these concerns.

Thank you for your attention to this matter.

Sincerely,

Norris Q. Howard, Sr.
Paramount Chief
Pocomoke Indian Nation
3355 Allen Road
Eden, MD 21822
410-742-6795

Response to Comment 1: NASA responded directly to the commenter, indicating that it did not feel that additional cultural resources surveys of the beach/nearshore zone would be warranted. NASA's May 23, 2013 response is provided in this appendix as Document 007. The commenter's subsequent June 12, 2013 response is provided as Document 008.

THIS PAGE INTENTIONALLY LEFT BLANK

Document 007
NASA Response to Pocomoke Indian Nation
May 23, 2013

National Aeronautics and
Space Administration

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

Reply to Attn of: 228

May 23, 2013

Mr. Norris C. Howard, Sr.
Paramount Chief
Pocomoke Indian Nation
3355 Allen Road
Eden, MD 21822

Dear Chief Howard:

Thank you for the May 14, 2013 letter regarding the proposed Wallops Island Post-Hurricane Sandy Shoreline Repair project. As stated in your letter, you have concerns that artifacts of cultural significance may have been exposed by October 2012's Hurricane Sandy, and that additional archaeological survey of the project area should be undertaken prior to conducting the proposed renourishment. While we appreciate the concerns you have raised, we feel that in consideration of both the physical context of the proposed project area and the level of survey effort NASA has already undertaken, additional archaeological survey of the Wallops Island beach is not necessary. Following is our supporting rationale:

Physical Context of the Project Area

The area proposed for repair is approximately 12,000 feet of shoreline along southern Wallops Island. For most of its history, the project area has been in a state of constant erosion, losing shoreline in some places at a rate of more than 10 feet per year. However, with the installation of the approximately 3-mile-long rock seawall in the 1990s, over half of the shoreline's position within the project area has been fixed for more than 15 years, leading to complete erosion of the seaward beach and substantial scouring at the seawall's base. In summary, much of the proposed project area was open water prior to completing the initial beach fill (see Figure 1). The remaining mile of project area, a remnant of a large dredge-fill construction project to repair the beach following storm damage in 1962 (see Figure 2), continued to erode to the point that temporary geotextile tubes (shown on Figure 1) were installed until the beach fill was completed.

Also of note is that due to the continued erosion within the southernmost area of the project site, this area became a debris dumping area (to provide erosion protection) in the 1960s. The contents of the site included large pieces of concrete rubble, metal debris, soils, and munitions and explosives of concern (MEC). NASA conducted an MEC clearance and removal in October-November 2010. All MEC was removed; concrete and metal were recycled. During the removal, an intrusive clearance was conducted to an estimated depth of 1-2 feet below ground surface. The average elevation of the area was approximately 5 feet above grade, making the total clearance depth approximately 6-7 feet from the top of the berm.

NASA Response to Pocomoke Indian Nation (cont.)
May 23, 2013

2

Figure 1. Wallops Island Shoreline Prior to 2012 Initial Beach Fill

Figure 2. 1966 Image Showing Large Fill Area on South Wallops Island

NASA Response to Pocomoke Indian Nation (cont.)
May 23, 2013

Past Archaeological Investigation

Predictive Modeling: During the early stages of preparing a comprehensive shoreline management strategy for Wallops Island, in November 2003, NASA prepared a Cultural Resources Assessment (CRA) that examined each of the three land areas of the facility within WFF's property boundaries: Wallops Main Base, Wallops Mainland, and Wallops Island. The study was completed to assist NASA in meeting its obligations under Sections 106 and 110 of the National Historic Preservation Act and established a predictive model for understanding the archaeological potential over the entire WFF property. Since its approval by the Virginia Department of Historic Resources (VDHR) in 2003, WFF has utilized its results to determine when archaeological investigation is needed prior to undertaking an earth-moving activity. The model predicted that a small section of the southernmost end of the Wallops Island shoreline could have moderate sensitivity for both pre-historic and historic resources, therefore NASA planned to survey the area should future ground disturbing activities be needed within the area.

2006 Shoreline Field Survey: In anticipation of the need for shoreline restoration measures, NASA conducted an archaeological survey of 3.85 miles of the Wallops Island shoreline on September 18, 2006. During the survey, field archaeologists searched for all significant cultural materials within the project area. *No significant cultural remains or archaeological sites were discovered during this evaluation.*

2007 Shoreline Field Survey: In anticipation of the need for slurry pits for installation of geotextile tubes, NASA conducted a limited cultural resources survey along 1.85 miles of beach on January 22, 2007. This survey included a portion of beachfront that was revealed by the predictive model to have moderate potential for the presence of historic archaeological sites. During the survey, field archaeologists searched for all significant cultural materials within the geotextile tubes project area. *No significant cultural remains or archaeological sites were discovered during this evaluation.*

***2009 Borrow Area Field Survey*:** Between March and September 2009, NASA conducted a cultural resources study within a 2-square-mile block on each of the two proposed offshore borrow areas (see Figure 3). The primary objective of this study, which included archival research and a remote sensing survey, was to identify maritime related cultural resources, particularly submerged watercraft, and buried prehistoric sites within the two survey areas.

Magnetic and acoustic (side scan sonar, sub bottom profiler, and echo sounder) bathymetric data were reviewed during data collection for anomalies, and reviewed a second time during post-processing. The greatest amount of ferrous material was detected in Unnamed Shoal A, which is located approximately 1.5 miles east of Blackfish Bank Shoal. The acoustic and magnetic anomalies on Unnamed Shoal A are consistent with debris that originated from two sources: (1) sport and commercial fishermen, who often lose anchors, chains, wire rope sections, trawls and general flotsam, and (2) barges that have transported and dropped a variety of ferrous debris to create an artificial reef on Blackfish Bank Shoal.

Data analysis, when coupled with the commercial and recreational fishing that takes place at or near Unnamed Shoal A and Unnamed Shoal B, indicated that *none of the detected anomalies have potential to represent significant submerged cultural resources.*

NASA Response to Pocomoke Indian Nation (cont.)
May 23, 2013

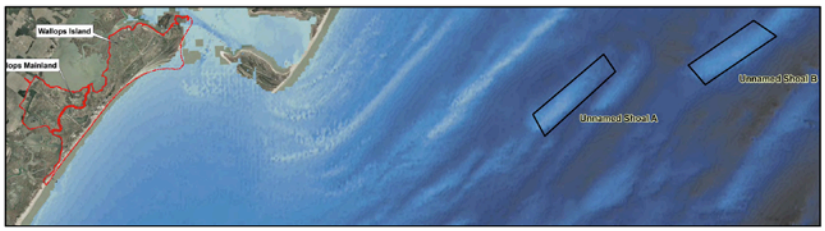


Figure 3. Offshore Sources of Beach Fill Material; Both Unnamed Shoals A and B were Surveyed in 2009 for Cultural Resources

2009 Nearshore Field Survey: A cultural resources study was conducted in August 2009 to identify maritime related cultural resources, particularly submerged watercraft, and buried archaeological sites within the nearshore area proposed for a sand retention structure (breakwater or groin). The survey consisted of four tasks: remote sensing of the proposed breakwater location, a scientific diving survey of the proposed structure location, a pedestrian survey of the Wallops Island shoreline, and archaeological monitoring of geotextile tube installation on the shoreline. A total of 92 acres was evaluated during the survey efforts.

Analysis of the target groups indicated that none of the target groups had the potential to represent significant submerged cultural resources. They instead represent debris associated with the previous structure (evidenced by wooden piling and steel cable) that was demolished or debris that was dumped within the survey area. In summary, *the archaeological studies undertaken for the shoreline program did not identify any significant cultural resources.*

Initial Beach Fill Induced Shoreline Changes

The initial beach fill placed in spring and summer 2012 filled the substantial void east of the seawall with sand dredged from Shoal A approximately 7 miles east of Assateague Island; approximately 12 miles northeast of the project site. Along most of this approximately 4 mile length of shoreline, up to 10 feet of "new" sand was placed (see Figure 4). Along the southernmost portion of the project area, which consisted primarily of intertidal beach, approximately 6-8 feet of "new" sand was placed on top of the existing bottom (see Figure 5). In both Figures, the green line is prior to initial beach fill; the red line post-beach fill; and purple line is post-Hurricane Sandy. As shown in these figures, the primary movement of sediment within the project area was in the cross-shore (easterly) direction and there was not notable erosion of the pre-existing bottom. In summary, we are confident that the majority of sand movement that occurred as a result of Hurricane Sandy was the "new" sand from the offshore borrow area, a location that was subjected to rigorous archaeological investigation as summarized above.

NASA Response to Pocomoke Indian Nation (cont.)
May 23, 2013

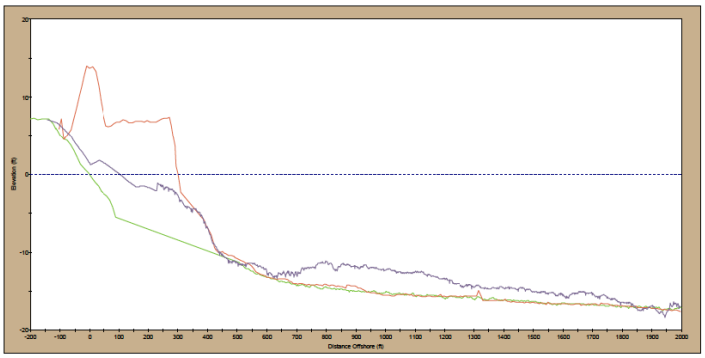


Figure 4. Beach Profiles at Southernmost Area of Project

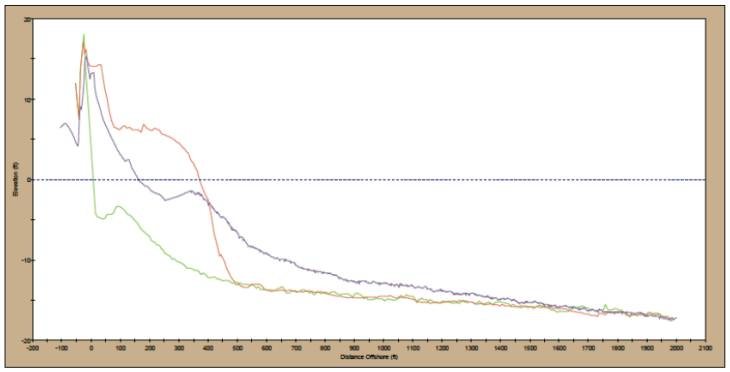


Figure 5. Beach Profiles at Middle Area of Project

Conclusion

In consideration of the facts that: (1) the entire project area has been subjected to a multitude of both natural (erosion) and manmade (filling, excavation) disturbances prior to the spring/summer 2012 initial beach fill, (2) a very limited portion of the project area has been modeled to have the potential for cultural resources, (3) the subject area has been investigated multiple times prior to the initial beach fill, and that (4) a majority of the Hurricane Sandy-induced sediment movement within the project area was "new sand" from the previously surveyed offshore borrow area, we do not plan to conduct additional archaeological investigations at this time. This conclusion is also supported by the multiple project-related consultations with the VDHR, which have

NASA Response to Pocomoke Indian Nation (cont.)
May 23, 2013

concluded that no additional survey work is needed on the Wallops Island shoreline; rather survey work would only be required in an area several miles east in the ocean if the dredging contractor proposes additional anchorages for pump-out equipment.

However, during the course of this or any other project undertaken at WFF, if an unexpected discovery of cultural resources occurs, we will immediately stop work and consult with the VDHR and potentially interested tribes, including the Pocomoke Indian Nation, to determine the significance of the resource, potential effects on it, and any necessary mitigation that could be taken.

Thank you for your interest in this project. Please do not hesitate to contact me to if you would like to discuss our response further. You can either reach me at 757-824-1309, or at Randall.M.Stanley@nasa.gov. Alternately, you may contact Mr. Josh Bundick at 757-824-2319, or at Joshua.A.Bundick@nasa.gov.

Sincerely,

Randall M. Stanley

Randall M. Stanley
Historic Preservation Officer

Enclosure

cc:
228/Mr. P. Bull
250/Mr. J. Bundick
EMD/Ms. J. Groman
VDHR/Mr. R. Kirchen
VHDR/Ms. A. Lee

Document 008
Pocomoke Indian Nation Response to NASA's May 23, 2013 Letter
June 12, 2013

POCOMOKE INDIAN NATION
3355 Allen Road – Eden, Maryland 21822

June 12, 2013

Randall M. Stanley
Attn: 228
Historic Preservation Officer

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

Dear Mr. Stanley:

This letter addresses your response to the comments and requests found in my letter dated May 14, 2013 regarding the Post-Hurricane Sandy project to repair the Wallops Island shoreline. You have addressed my concerns by pointing out a chronological series of surveys, archaeological investigations, archival research, and consultations with the Virginia Department of Historic Resources. You point out that in 2003 Wallops Flight Facility (WFF) "established a predictive model for understanding the archaeological potential over the entire WFF property" and that WFF has utilized its results accordingly.

In view of your response and with the understanding that "if any discovery of cultural resources occurs" work will stop, and WFF will consult with the Pocomoke Indian Nation and other appropriate parties to address, investigate, and take mitigation if necessary, I concur that additional archaeological survey of the Wallops Island beach is not necessary.

Please forward copies of this letter to:

Mr. P. Bull
Mr. J. Bundick
Mrs. J. Groman
Mr. R. Kirchen
Mrs. A. Lee.

If you have any questions, please do not hesitate to ask.

Sincerely,

Norris C. Howard, Sr.
Paramount Chief
Pocomoke Indian Nation
410-742-6795

THIS PAGE INTENTIONALLY LEFT BLANK

Document 009
The Nature Conservancy
May 14, 2013

The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy in Virginia
490 Westfield Road
Charlottesville, VA 22902

tel (434) 295-6106
fax (434) 979-0370
nature.org

Virginia Officers

Chair
Clifford A. Cutchins IV
Richmond

Vice-Chair
Charles W. Moorman
Norfolk

Secretary
Wiley F. Mitchell Jr.
Virginia Beach

Treasurer
Robert H. Trice
Arlington

Board of Trustees

Madge Bemiss
Richmond

William M. Boldon
King George

Jane Fisher Bowles
Charlottesville

Judith Ayres Burke
Middleburg

Mitchell A. Byrd
Williamsburg

Lisa D. Collis
Alexandria

James P. Craig
Keswick

Timothy P. Dunn
Rectortown

James B. Fleming
Alexandria

Matthew J. Gerber
Washington DC

Jil W. Harris
Richmond

Lucius J. Kellam III
Belle Haven

Karl K. Kindig
Abingdon

William H. Lewis
Gordonsville

Louis W. Moelchert, Jr.
Richmond

Donald E. Perry
Virginia Beach

Timothy B. Robertson
Virginia Beach

E. Lee Showalter
Midlothian

John C. Ulfelder
McLean

Kenan L. White
Richmond

Virginia Director
Michael L. Lipford

May 14, 2013

Joshua Bundick
NASA Wallops Flight Facility
Mailstop 250.W
Wallops Island, Virginia 23337

Re: Comments on Wallops Island Post-Hurricane Sandy Shoreline Repair Draft Environmental Assessment

Dear Mr. Bundick:

On behalf of The Nature Conservancy in Virginia, I am writing to provide our comments to NASA-Wallops Flight Facility (WFF) on its Draft Environmental Assessment for Wallops Island Post-Hurricane Sandy Shoreline Repair (DEA). As with all our past engagement with NASA WFF on environmental reviews under the National Environmental Policy Act, we appreciate the opportunity to comment on this project.

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. As you know, The Nature Conservancy (Conservancy) has been working for over four decades to protect the barrier islands and coastal habitats of Virginia's Eastern Shore. The Conservancy's ownership and stewardship of 14 barrier islands and 52 miles coastline immediately south of Wallops Island motivated our strong interest in working with NASA WFF to ensure the original Shoreline Restoration and Infrastructure Protection Project (SRIPP) in 2009 avoided and minimized impacts to the regional sediment regime upon which the ecological health of the barrier islands depend. It is those same investments, ownership, and conservation interests, coupled with the fact that we are also interested in ensuring that NASA's investments in the Eastern Shore remain viable over the long-term, that have motivated us to work increasingly closely with NASA since May 2009. As we have stressed in previous comment letters and, more meaningfully, in face to face meetings, we greatly appreciate how valuable a partner NASA has become for our work on the Eastern Shore.

Overall, the Conservancy has no objections or serious concerns with the work outlined in the Proposed Action. We agree with NASA that the proposed work is consistent in nature and extent to the renourishment component of Alternative 1 as described in the Final PEIS for the SRIPP, an alternative the Conservancy supported. As we stated in our April 19, 2010 letter on the Draft PEIS, 1

TNC Comments on NASA-WFF Post Sandy DEA Page 1 of 4

Response to Comment 1: NASA notes The Nature Conservancy's comment that it has no objections or serious concerns with the Proposed Action.

Alternative 1 "will provide short-term protective benefits to [Wallops Flight Facility] without creating significant deleterious impacts to the barrier islands owned by the Conservancy and other conservation partners to the north and south of Wallops Island." We are not aware of any conditions or additional information that would alter this previous assessment. 1 (cont.)

At the same time, NASA's proposed action in this DEA provides us with an opportunity to raise the same basic issues that we raised in our April 19, 2010 letter and in many subsequent conversations with NASA and other stakeholders. To summarize briefly, those issues are as follows:

1. While the SRIPP work did appear to provide some protection during Hurricane Sandy, the loss of so much sand from a relatively moderate storm emphasizes that maintaining even this level of protection will likely require frequent and costly maintenance and reconstruction. While it is too early to state definitively whether the renourishment anticipated in the Final PEIS (9 renourishment cycles over the anticipated 50-year life of the project) understated the true maintenance requirements, the need for significant renourishment so soon after project completion does seem to suggest that need may be higher than originally projected. 2
2. In many ways the higher cost of ongoing maintenance pales in comparison to whether the SRIPP – or any engineered solution – can provide adequate protection to NASA's infrastructure on Wallops Island, especially given rising sea levels and increasingly frequent and more powerful coastal storms. As we stated at the very start of these discussions, we are concerned that NASA's infrastructure remains extremely vulnerable and, in its current location, will become far more so over time. 3
3. We have and continue to advocate that NASA consider strategic relocation of its critical infrastructure off of Wallops Island and on to the mainland. We acknowledge that such a move is costly and presents its own series of safety, engineering, and technical challenges, but again submit that those are likely more malleable problems that the threats facing NASA WFF's infrastructure in its current location. 4
4. We remain concerned that NASA lacks some of the fundamental science on the barrier island system and the associated geology and sediment dynamics to inform management decisions that will best protect the shoreline of Wallops Island while avoiding any deleterious impacts to the larger surrounding system. As we stressed in our earlier comments on the SRIPP, our consultant on that project, Dr. Robert S. Young, strongly questioned the utility of the GENESIS model used by USACE to produce detailed volume data for beach renourishment and estimates of beach fill durability, since the calibrated model was not successfully verified and does not account for the influence of antecedent geology on the sediment budget at Wallops. The Conservancy submits that there are at least two ways to begin to improve our collective understanding of this complex system and to make better management decisions in the future. 5

First, we want to reiterate our earlier request that NASA-WFF expand the scope of its ongoing efforts to monitor beach volume and profile and determine the precise fate of sand as it erodes from the renourished beach. As we stated in our April 19, 2010 letter, "to produce credible 6

TNC Comments on NASA-WFF Post Sandy DEA Page 2 of 4

Response to Comment 2: NASA acknowledges that the long-term estimates of sand presented in the *Final PEIS* could be less that that actually needed to afford the design level of storm damage reduction to its Wallops Island facilities. To this end, NASA is committed to conducting long-term monitoring of the project area to identify erosional hotspots and make adjustments to projected sand volumes over the life of the project. Should the actual volumes needed differ substantially from those presented in the *Final PEIS*, NASA would prepare additional engineering and environmental analysis, as appropriate.

Response to Comment 3: NASA acknowledges that implementing a storm damage reduction strategy in the face of climate change will become an increasingly difficult task. However, as summarized in Section 2.3.5 of this EA, for each renourishment cycle, NASA will employ the results of its monitoring program to determine the appropriate volume of sand necessary to compensate for sea level rise. While Appendix A of the *Final PEIS* does present specific volumes of sand necessary to elevate the beach profile by an approximate height of 11 millimeters per year, these volumes are presented only for planning purposes. The actual amount employed would be determined by the results of the monitoring program.

Response to Comment 4: NASA appreciates the Nature Conservancy's recommendation to strategically relocate critical infrastructure to areas less susceptible to storm damage. As discussed in Sections 2.2.1 and 2.3.3 of the *Final PEIS*, due to the hazardous nature of operations on Wallops Island, many of NASA's facilities (e.g., launch pads, spacecraft fueling facilities) must remain at a substantial distance from the general public. Their relocation would require major disruption to neighboring property owners. In summary, planning for this type of relocation is outside the temporal boundary of actions considered in this EA.

However, for those facilities that are not subject to such hazardous operations, NASA already considers the potential for storm damage in its planning process. As such, it would construct such future facilities in areas in less damage-prone areas, as practicable.

Response to Comment 5: NASA is aware that there are those within the scientific community who have concerns regarding the ability of the GENESIS model to accurately reflect sediment transport dynamics. However, it should be noted that all mathematical models have limitations and can not exactly mimic nature. While they do provide valuable insights, the fact that they have inherent limitations is one of the principle reasons for NASA's adoption of an adaptive management strategy for planning future renourishment cycles.

As such, the renourishment volumes presented in the *Final PEIS* should be interpreted as estimates that will be validated by long-term shoreline monitoring. Should observed shoreline performance differ substantially from the estimates produced by GENESIS, NASA would reassess its storm damage reduction strategy for Wallops Island.

Response to Comment 6: NASA appreciates The Nature Conservancy's request for a "landscape level" monitoring effort. However, the objectives of NASA's shoreline monitoring program are twofold: (1) to track sediment movement such that renourishment cycles can be planned; and (2) to determine the extent to which the project may be impacting adjacent properties.

Accordingly, NASA has established the geographic extent of the monitoring area to include not only its shoreline but also the entire length of neighboring Assawoman Island and the southern 0.5 miles of Assateague Island to the north, a total distance of approximately 14 miles. NASA is confident that this geographic extent will provide the information necessary to identify the need to renourish the beach, therefore fulfilling Objective 1.

Response to Comment 6 (cont.): Regarding Objective 2, the largest project-induced shoreline changes would be expected to occur immediately adjacent to the project, decreasing exponentially with distance from the project. To this end, the coastline of the Virginia portion of the Delmarva Peninsula has been experiencing chronic and severe erosion for at least the last 150 years. This shoreline erosion is the primary reason for the need for shoreline protection at Wallops Island. It is also one of the chief causes driving the evolution of the other barrier islands and inlets along Virginia's Eastern Shore.

It is important to note that these coastal features have changed in shape and location in the past and will continue to do so in the future regardless of whether modifications are made to the Wallops Island shoreline. This is especially true when considering potential future shoreline changes driven by rising sea levels.

While a substantial expansion of the study area would be a commendable academic endeavor, NASA expects that the added tangible benefits to meeting Objective 2 from such a study would be limited. Within the the context of a very dynamic system driven by a myriad of complex processes, attempting to effectively separate natural variability, sea level rise, and other complicating factors from the equation to derive a meaningful cause and effect relationship between NASA's project and changes within a larger study area would be impractical. Therefore, NASA intends to maintain its current 14-mile-long study area.

results and conclusions about onshore-offshore sediment transport, the geographic extent of the shoreline and beach volume monitoring must extend well beyond the four-meter closure depth and include a significant buffer to the north and south of Wallops—essentially a landscape-scale monitoring effort." Given the recent damage to the SRIPP from Hurricane Sandy, we believe such an expanded monitoring effort is more important now than ever. 6 (cont.)

Second, we want to make sure that NASA-WFF is aware and supportive of a project proposal that the Conservancy and academic partners have submitted a to Region V of U.S. Fish and Wildlife Service for Hurricane Sandy Supplemental funding, entitled "Investigating the Impacts of Climate Change on the Chincoteague Inlet- Barrier Island System and Developing Collaborative Stakeholder Adaptation Strategies in the Chincoteague National Wildlife Refuge Area." A copy of the proposal is attached. In short, the study will examine the impacts of climate change and coastal management strategies on the Chincoteague Inlet-barrier island system. The overarching goal of the study is to determine which management approaches will allow the inlet and barrier island system to adjust gradually to changing climate, thereby avoiding the impact of catastrophic change and providing the greatest possible benefit to all stakeholders in the region. We know that NASA-WFF has already supported the need for this sort of study, and we hope to work with you on this effort and associated projects in the future. 7

While we continue to stress these issues, we must acknowledge and praise NASA for the significant and concrete steps it has taken over the last few years, and especially the last several months, on these fronts. First and foremost, NASA convened a highly successful *Resilience and Adaptation to Climate Risks Workshop for the Eastern Shore of Virginia* in November, which is a significant step forward in your efforts to understand with more accuracy and precision how a changing climate will impact your operations at Wallops Flight Facility.

We are also excited about the prospect of establishing a Mid-Atlantic Coastal Research Institute and appreciate the initiative and leadership taken by Caroline Massey to move this from a concept to a reality. This effort has the real potential to help ensure that NASA and the leading academic institutions in the region, including the University of Virginia's Long Term Ecological Research Project and the Marine Science Consortium among others, better coordinate, collaborate, and synthesize data and information necessary to understand the regional coastal ecosystem and quantify associated critical ecosystem services on which people and economies depend. The Conservancy hopes to work with stakeholders to apply the research produced from the institute to inform various adaptive management responses to climate change that enhance the resilience of both the natural and built environments along the Eastern Shore and the greater Mid-Atlantic. Ideally, the Chincoteague Inlet – barrier island system project outlined above and associated subsequent research efforts could be some of the headlining projects at the Coastal Research Institute when it is formally established. 8

We are also very appreciative of NASA's work with the Navy and Accomack County to initiate the Joint Land Use Study. We believe this study will be very valuable to identify how land use surrounding the facility has the potential to impact both existing operations and NASA's flexibility to expand and/or modify those operations in the future, especially preserving

TNC Comments on NASA-WFF Post Sandy DEA Page 3 of 4

Response to Comment 7: NASA is aware of the subject proposal and is very supportive of the study's goals and objectives. Should the project receive funding, NASA would gladly share its data with the study team. *Please note that the referenced proposal is not included here in Appendix B; rather it is available upon request.*

Response to Comment 8: NASA is also excited about the larger-scale collaborative planning efforts that are underway, and looks forward to continued fruitful partnerships with The Nature Conservancy.

alternatives for relocation of facilities. The JLUS should also identify a number of ways that NASA, the Navy, Accomack County, and other stakeholders, including The Nature Conservancy, can work together to address these issues in a proactive, collaborative, and coordinated fashion. Again, The Nature Conservancy appreciates NASA's leadership on this front. 8 (cont.)

In conclusion, The Nature Conservancy recognizes the very real challenges NASA faces as it seeks to protect the sizeable investments and important operations at the Wallops Flight Facility. We appreciate the necessity of continued investments in the SRIPP, and the increasing attention NASA is devoting to wrestling with longer term solutions, especially related to addressing climate changes impacts in a real and comprehensive fashion. As always, we value our partnership and look forward to continuing to work with NASA on these important issues. Please contact Gwynn Crichton, Senior Project Scientist at 434-951-0571 or gcrichton@tnc.org with any questions or request for additional information.

Most sincerely,

Michael Lipford
Virginia Director

Cc (via email):

Cindy Schulz, Field Supervisor, Ecological Services, Virginia Field Office, USFWS
Lou Hinds, Superintendent, Chincoteague National Wildlife Refuge, USFWS
Trish Kicklighter, Superintendent, Assateague Island National Seashore, NPS
Laura McKay, Director, Virginia Coastal Zone Management Program, DEQ
Karen McGlathery, Director, Virginia Coast Reserve Long-Term Ecological Research, UVA
Tom Smith, Director, Division of Natural Heritage, DCR
Tony Watkinson, Chief, Habitat Management Division, VMRC
David Whitehurst, Director, Wildlife Resources, DGIF

TNC Comments on NASA-WFF Post Sandy DEA Page 4 of 4

Document 010
U.S. Navy Fleet Forces Command
May 14, 2013

Tuesday, May 14, 2013 1:43:16 PM ET

Subject: WFF shoreline EA
Date: Tuesday, May 14, 2013 1:40:04 PM ET
From: Kerr, Patricia k CIV USFF, N46
To: Bundick, Joshua A. (WFF-2500)
CC: Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)]

Josh, we have reviewed the WFF Shoreline Repair EA and have no comments to provide you at this time. We applaud your effort of a 104 page document! Thanks for including us in the review and we look forward to our continued partnership. v/r, Patsy | 1

Patsy Kerr
U.S. Fleet Forces Command
Natural Resources Support/Encroachment
Homebasing/Homeporting
757-836-6336
Fax 757-836-7439

Page 1 of 1

Response to Comment 1: NASA notes that the Fleet Forces Command does not have comments to provide on the Draft EA.

THIS PAGE INTENTIONALLY LEFT BLANK

Document 011
Hampton Roads Military and Federal Facilities Alliance
May 21, 2013

HAMPTON ROADS MILITARY AND FEDERAL FACILITIES ALLIANCE

KENNETH I. WRIGHT, CHAIR • MARY K. JONES, VICE CHAIR • E. DANA DICKENS III, TREASURER • DWIGHT L. FARMER, SECRETARY

May 21, 2013

Mr. Joshua A, Bundick
Lead, Environmental Planning
NASA Goddard Space Flight Facility
Wallops Flight Facility, Code 250.W
Wallops Island, Virginia 23337

Re: Comments of Hampton Roads Military and Federal Facilities Alliance on the Wallops Island Post-Hurricane Sandy Shoreline Repair Environmental Assessment.

Dear Mr. Bundick:

The Hampton Roads Military and Federal Facilities Alliance (HRMFFA) hereby submits its comments on the National Aeronautics and Space Administration (NASA) Wallops Island Post-Hurricane Sandy Shoreline Repair Draft Environmental Assessment (EA). HRMFFA was established to protect, preserve and grow military and federal capabilities in the Hampton Roads region by working to retain and attract organizations, capabilities, and investments owned, operated or funded by the Federal government. Our organization is managed by a Board of Directors comprised of local Mayors and county Board of Supervisor Chairs, as well as members of the local business community.

HRMFFA fully supports NASA's proposed Shoreline Repair Project. Based upon our review of the EA, it is clear that the Wallops Island shoreline must be restored to its pre-Hurricane Sandy condition to allow for the necessary level of storm damage protection for which the beach was originally designed. Without this project, critical NASA launch assets, such as Launch Complex 0 and sounding rocket pads, are in jeopardy of being damaged, destroyed or rendered inoperative by future storms. Given the importance of the mission at NASA Wallops, these assets must be protected. 1

As required by the National Environmental Policy Act (NEPA), NASA's EA analyzes a reasonable range of alternatives, and adequately identifies and assesses the potential impacts of the proposed action on the environment. Based upon our review of the EA, HRMFFA believes that the proposed action best meet's NASA's purpose and need, and urges NASA to approve the proposed action with a finding of no significant impact.

Sincerely,

Kenneth I. Wright
Mayor

HRMFFA
REGIONAL ADVOCACY FOR FEDERAL INVESTMENT

430A World Trade Center • Norfolk, Virginia 23510 • Office (757) 644-6324 • Fax (757) 625-4684

Response to Comment 1: NASA notes HRMFFA's support of the proposed project.

Goddard Space Flight Center