

Action ID: SAW-2009-00293

Permittee: Carteret County

Location: Barrier Island of Bogue Banks, including the Towns of Emerald Isle, Indian Beach, Pine Knoll Shores, Atlantic Beach, and the unincorporated community of Salter Path, Carteret County, North Carolina

Date: October 30, 2018

RECORD OF DECISION (ROD)

1. Introduction

Carteret County has applied for a Department of the Army (DA) permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Provided below are my findings and decision regarding this permit application.

Carteret County (County) has requested to implement a long-term management plan, known as the Bogue Banks Master Beach Nourishment Plan (BBMBNP), to provide shoreline protection along the approximately (~) 25-mile Bogue Banks barrier island, Carteret County, North Carolina. Management components include the use of offshore and inland borrow sources for periodic nourishment along ~18 miles of Pine Knoll Shores, Salter Path, Indian Beach, and Emerald Isle, with potential supplemental nourishment along ~ 5 miles of Atlantic Beach if needed. The plan also consists of the maintenance of Bogue Inlet ebb tide channel within a "safe box" zone to protect the inlet shoreline of Emerald Isle. The development and implementation of the BBMBNP is under the guidance of an interlocal agreement signed on March 15, 2010, which contemplated that the project would be approved, carried out, and completed under a common plan, one permit, and a common source of tax funding and revenues to provide sufficient shoreline protection for the island of Bogue Banks.

Due to the uncertainty of federal funding of Coastal Storm Damage Reduction (CSDR) and Coastal Storm Risk Management (CSRM) projects, which includes Bogue Banks, this project will be funded by the County if federal funding is not appropriated in the future.

As the District Engineer for the Wilmington District, U. S Army Corps of Engineers (USACE), it is my decision, based on review of the Final Environmental Impact Statement, Bogue Banks Master Beach Nourishment Plan dated February 2018 (FEIS) and the District's files on this matter, that the proposed project is permittable with the inclusion of permit special conditions. I find the applicant's proposed plan, as modified by the DA permit special conditions, to be permittable in light of my analysis of the available alternatives in relation to public interest review factors and the environment. These findings support my decision to authorize a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for the proposed project (i.e., Alternative 4).

With the County's proposal, overlapping regulatory authority existed between the Wilmington District and the Bureau of Ocean Energy Management (BOEM). Due to the main borrow site being located outside the 3.0 nautical mile (nm) limit, the County is required to obtain a leasing agreement with BOEM for any dredging operations in this area. The Wilmington District and

the BOEM reached an agreement, by letter dated December 7, 2010, where the Corps would act as the Lead agency and BOEM as the cooperating agency. Our two agencies collaborated in these roles, as defined by the Council of Environmental Quality regulations 40 CFR 1501.5, 1501.6, and 1508.16, during the review and assessment of the proposed project. Further definition of our roles was set forth in the Wilmington District letter dated October 25, 2013 as it relates to consultation for Section 7 of the Endangered Species Act (ESA), Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens), National Historic Preservation Act (NHPA), and the Coastal Zone Management Act (CZMA).

2. Description of the Applicant's Proposed Project

Under the County's preferred alternative, identified as Alternative 4 (or the BBMBNP) in the FEIS and in this document, the County, through the interlocal agreement, would manage the renourishment of all of the ~ 18 miles of beaches along Pine Knoll Shores, Indian Beach/Salter Path, Emerald Isle, and along with the eastern shoreline of Bogue Inlet. Atlantic Beach is a party to the agreement; however, it is the on-going recipient of regular Corps placements of navigation dredged material from the Morehead City Harbor (MCH) channels and has been for nearly two decades. The County is not anticipating any maintenance sand placement on Atlantic Beach under its management plan, but the plan would provide interim maintenance nourishment events along Atlantic Beach should the federal MCH placement cease or if storm-related needs arise.

Under Alternative 4, the 50-year management plan would employ a regular and recurring cycle of nourishment events, in combination with periodic realignments of the Bogue Inlet ebb tide channel, to continuously maintain beach profile sand volumes at a 25-year Level of Protection (LOP). This LOP equates to protection for upland structures against a 25-year storm event, and nourishment events would be implemented according to 25-year LOP beach profile volumetric triggers. Volumetric triggers were developed by analyzing and adjusting design beach profiles in a series of iterative SBEACH numerical modeling runs as described in the Engineering Report (Appendix I of the FEIS). The final modeling results indicated appropriate volumetric triggers ranging from 211-266 cubic yards (cy)/foot along Bogue Banks, averaging 238 cy/foot. Based on variability in the volumetric triggers, the project shoreline was divided into management reaches ranging in length from 2.4 to 4.5 miles. Reaches include Pine Knoll Shores, Indian Beach/Salter Path, Emerald Isle (EI) East, EI Central, EI West, and Bogue Inlet. Based on the SBEACH modeling results and observed background erosional loss rates, EI Central, EI West, and Bogue Inlet management reaches are expected to require recurring nourishment of ~ 0.06 to 0.23 million (Mcy) of material at intervals of six to nine years to offset background erosion. For Pine Knoll Shores, Indian Beach/Salter Path, and EI East, recurring maintenance events would place ~ 0.2 to 0.5 Mcy of material at intervals of three to six years to offset background erosion. Actual maintenance nourishment intervals would be expected to vary in response to background erosion rate variability over the course of the 50-year project.

For Bogue Inlet management, the proposal has designated a "safe box" within the inlet throat where the ebb channel would be allowed to migrate freely so long as it remains within the boundaries of the safe box. If the channel migrates beyond the eastern boundary of the safe box (or toward Emerald Isle), this would trigger a preemptive event to realign the ebb channel mid-center within the established boundary. The limits of the safe box were developed and evaluated

through empirical analysis of historical inlet changes and supplemental numerical modeling. Historical ebb channel alignments and corresponding inlet shoreline positions were analyzed through GIS analysis of historical aerial photography, National Ocean Service (NOS) T-sheet maps, and LIDAR topographic maps. Past migration rates and corresponding shoreline changes indicate that once eastward migration accelerates toward Emerald Isle, the migrating channel has the potential to threaten structures along the shoreline within two to three years.

Based on the historical patterns, a safe box was established with boundaries corresponding to the location where acceleration of the ebb channel towards the west end of Emerald Isle has occurred in the past. The validity of the boundaries were then evaluated by modeling a series of six idealized inlet configurations encompassing the range of most relevant historical ebb channel alignments. Modeling results did not show any additional geomorphological indicators of an impending shift to accelerated migration that warranted modifications to the initial safe box. Once the boundary threshold is triggered, the relocation event would entail the construction of a channel ~ 6,000-feet long with variable bottom widths ranging from 150 to 500 feet at a depth of -18 feet NAVD88, including overdredge depth. The dimensions of the channel would be similar to the footprint of the ebb tide channel realignment construction completed in 2005 (see 3.3.1 and 3.3.4 of the FEIS). Maintenance events of Bogue Inlet are expected ~ every ten to fifteen years, with corresponding placement of dredged material on the beaches of Emerald Isle.

Beach fill for all the proposed nourishment activities on Bogue Banks would be acquired from a combination of sources including offshore borrow sites, Atlantic Intracoastal Waterway (AIWW) disposal areas, upland sand mines, and the management of the Bogue Inlet. The offshore borrow sites consist of the Old Offshore Dredge Material Disposal Site (ODMDS) and the current ODMDS, which are located ~ 3 nms offshore from Beaufort Inlet, and Area Y, which is located over 1.0 nm offshore from EI West reach. It is expected that hopper dredge plants will be used to extract beach fill material from the offshore borrow sites. Material would be transported from the hopper dredges to offshore booster pumps and carried to the appropriate nourishment reaches via pipeline. A hydraulic cutterhead dredge will likely be used during the management of the inlet bar channel event, which would transport the dredge material directly from the dredge plant onto the beach via pipelines.

3. Purpose and Need

Basic purpose and need, as stated by the applicant and identified in Chapter 2 of the FEIS, for this proposal is to establish and implement a comprehensive, long-term, non-federal beach and inlet management program that would preserve Bogue Banks' tax base, protect its infrastructure, and maintain its tourism-based economy. The proposed action is to address the ongoing trend of declining federal shore protection funding by establishing a non-federal management program under the autonomous control of the County and the island municipalities.

Overall purpose and need of the County's island wide regional strategy was developed to do the following:

- Establish a regional approach by consolidating local community resources, both financially and logistically, to manage Bogue Inlet and the beaches on Bogue Banks in an effective manner
- Provide long-term shoreline protection stabilization and an equivalent level of protection along Bogue Banks' 25-mile oceanfront/inlet shorelines addressing long-term erosion
- Provide long-term protection to Bogue Banks' tourism industry
- Provide short and long-term protection to residential and commercial structures and island infrastructure
- Provide long-term protection to the local tax base by the protection of existing and future tax bases and public access/use
- Maintain and improve natural resources along Bogue Banks' oceanfront and inlet shoreline by using compatible beach material in compliance with the North Carolina State Sediment Criteria for shore protection
- Maintain and improve recreational uses of Bogue Banks' oceanfront/inlet shorelines
- Maintain navigation conditions within Bogue Inlet
- Balance the needs of the human environment with the protection of existing natural resources.

4. Public Coordination

In compliance with my responsibility under the National Environmental Policy Act (NEPA) of 1969, I have determined that the issuance of a permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for the applicant's proposal (Alternative 4) to implement a 50-year management plan for up to 25 miles of Bogue Banks would constitute a major federal action significantly affecting the quality of the human environment. An EIS was prepared in accordance with the requirements of NEPA (40 CFR Parts 1500 - 1508) and USACE regulations (33 CFR Part 325, Appendix B).

Public and agency scoping for this EIS was initiated at the beginning of the NEPA process through the solicitation of written public comments, a public scoping meeting, and the formation of an interagency-stakeholder review team (Project Review Team or PRT). The USACE, Wilmington District initiated the EIS process through the publication of a Notice of Intent (NOI) in the Federal Register on 15 September 2010 (75 FR 56080-56082). The NOI disclosed the intent of the USACE to prepare an EIS, provided basic information on the Applicant's proposed action, and requested input from the public. The NOI information was also made available to the public in a Public Notice (PN) that was published on the Wilmington District's webpage on 17 September 2010. The NOI and PN announced and invited the public to participate in the public scoping meeting that was subsequently held on 30 September 2010 at the Crystal Coast Civic Center in Morehead City, NC.

In a continual effort to include the public and all state and federal agencies in the review and scoping process, the PRT was assembled and included various entities including state and federal regulatory and resource agencies, local governments, non-profit groups, and other stakeholders;

as well as the third party contractor EIS team and the Applicant's engineering design team. The PRT was established as a scoping outreach mechanism to facilitate agency and stakeholder participation in the EIS process. This approach provided a forum for outside interests to share input on the scope of the EIS and bring forward any concerns and relevant issues related to the proposed action. The Project Review Team input provided critical information regarding potential effects on a wide range of interests, locally significant resource areas, and potential conflicts or problems. A principal objective of the PRT process was to identify and address concerns early in the planning process. Meetings were held in Carteret County on 30 September 2010, 8 March 2011, 6 June 2012, and 29 October 2013. Additional information can be found in Chapter 1.4 of the FEIS.

Through the NEPA review, all alternatives were subject to agency and public review and input. Our NEPA review included a public scoping meeting, PRT meetings, and the circulation of public notices on the Draft and Final EIS.

a. Draft Environmental Impact Statement

After a study of the project, review of public comments, and coordination with the members of the PRT, the Corps prepared a Draft Environmental Impact Statement (DEIS). Preliminary drafts of both the DEIS and Final Environmental Impact Statement (FEIS) were prepared through a third-party contractor, Dial Cordy and Associates Inc., working under the direction and review of the Corps pursuant to 33 CFR §325, Appendix B, at para. 8(f). All published EIS documents were reviewed and edited by the Corps, and reflect the Corps' independent judgment.

The Notice of Availability (NOA) for the DEIS was filed with the U.S. Environmental Protection Agency (EPA) via e-NEPA on May 15, 2017. A NOA was also submitted to the U.S. Army Records Management & Declassification Agency and published in the Federal Register (Volume 82, Number 71) on April 14, 2017. A local PN was issued on April 14, 2017 announcing the release of the DEIS and requested public and agency comments on the proposed project, on the DEIS, and on the various alternatives described in that document. The publication and review period of the DEIS coincided with the NC State Clearinghouse review process. Pursuant to the NC SEPA, the DEIS was provided to the State Clearinghouse which published the NOA in the NC Environmental Bulletin on 26 April 2017 and distributed copies of the EIS document to state/local agencies for review and comment.

b. Final Environmental Impact Statement

The Final Environmental Impact Statement for the Bogue Banks Master Beach Nourishment Plan dated February 2018, was filed with EPA via e-NEPA on March 2, 2018 and a NOA was also submitted to the U.S. Army Records Management & Declassification Agency and published in the Federal Register on March 5, 2018. The Corps simultaneously issued a local PN on March 1, 2018 announcing the release of the FEIS and requested public and agency comments on the proposed management plan and the FEIS. The publication and review period of the FEIS coincided with the NC State Clearinghouse review process. The FEIS was prepared in accordance with the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508), as amended, the U.S. Army Corps of Engineers' regulations for implementing the National

Environmental Policy Act of 1969 (33 CFR 230), as amended, and the U.S. Army Corps of Engineers' Regulatory Program regulations (33 CFR Part 325, Appendix B), as amended.

5. Alternatives Considered

A wide range of potential alternatives were identified and considered during the EIS scoping process; including options identified by the County as part of its effort to develop the proposed BBMBNP, alternatives identified through coordination with the USACE and BOEM, and the no-action alternative as required by CEQ regulations. Potential alternatives were evaluated and screened, and five alternatives were determined to be "reasonable" on the basis of being "practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant", as defined by CEQ regulations (40 CFR 1500 *et. seq.*). Other factors considered in determining the reasonability of an alternative included its ability to meet the basic purpose and need and its consistency with NC's coastal management policies. Reference Chapter 3.0 of the FEIS for a detailed description of all assessed alternatives, including those that were deemed unreasonable and eliminated from further consideration. Below is a summary of the reasonable alternatives that were considered and carried forward in our evaluation:

a.) Alternative 1- No Action Alternative (Status-Quo), (Chapter 3.3.1 of the FEIS). This alternative represents the continuation of shore protection management efforts over the next 50 years in the same manner as in the past. Continuing shoreline protection activities would include: 1) USACE placements of navigation dredged material on Fort Macon and Atlantic Beach via maintenance of the MCH navigation channels, 2) USACE placements of navigation dredged material on the west end of Emerald Isle via maintenance of the AIWW Bogue Inlet Crossing, 3) erosional hotspot response nourishment projects implemented by the individual municipalities and/or the County using offshore borrow areas, 4) and relocation events of the Bogue Inlet ebb channel. Additional activities that would be expected to continue under Alternative 1 include oceanfront beach bulldozing and temporary sandbagging by local municipalities and/or individual property owners. With the exception of the MCH and AIWW federal projects, all other activities will likely require some form of Section 404 and/or Section 10 Department of the Army authorization. Estimated implementation cost over the 50-year management period for Alternative 1 is ~\$330 million, which considered only the maintenance nourishment events and the USACE Beach Disposal.

b.) Alternative 2- Relocation and Abandonment (No Action/No Permit Alternative), (Chapter 3.3.2 of the FEIS). The County and municipalities would not pursue a long-term beach management project, nor would they undertake any federally permitted actions to mitigate oceanfront shoreline erosion along Bogue Banks, whether done individually or as co-sponsors. Actions requiring a federal permit, and thus excluded under Alternative 2, would include beach nourishment, dredging, inlet management, and any other activities below mean high water (MHW) line that require a federal Section 404/Section 10 permit. It is assumed that current USACE navigation dredging and beach disposal practices, which are not subject to Section 10 or 404 permit authorizations, would continue over the next 50 years; including maintenance dredging of the MCH channels with beach disposal to Atlantic Beach/Fort Macon, and maintenance of the AIWW Bogue Inlet Crossing channel with beach disposal to the west end of

Emerald Isle (Figure 3.4, Table 3.3). Additionally, USACE maintenance of the Bogue Inlet navigation channel via sidecast dredging with open water disposal would be expected to continue, as would additional USACE navigation dredged material disposal practices associated with the MCH project (i.e., disposal to the ODMDS, Brandt Island, and the designated Nearshore Placement Areas). Under this option, homeowners would also not pursue Section 10 or Section 404 authorizations to conduct measures to protect their properties or structures. The County and local municipalities would coordinate with individual property owners in circumstances where a structure is damaged or threatened by erosion. However, the decision and responsibility to relocate or demolish a home would ultimately fall to the property owner, not the County or municipality unless the structure is deemed a safety hazard to the public. Prior to demolition or relocation, individual property owners may choose to protect structures by installing temporary sandbags or conducting beach bulldozing above the MHW line, which would not require federal authorization. Estimated implementation cost over the 50-year management period for Alternative 2 is ~ \$278 million, which considered only the structure relocations and the USACE Beach Disposal.

c.) Alternative 3- Nourishment Only (Chapter 3.3.3 of the FEIS). Alternative 3 is similar to Alternative 4 (Applicant's Preferred) with the exception of managing Bogue Inlet. Through an interlocal agreement with all the island municipalities, the County would manage approximately ten miles of beaches along Pine Knoll Shores, Indian Beach/Salter Path, and eastern Emerald Isle through the implementation of a comprehensive 50-year beach nourishment project, with Atlantic Beach participating in the same manner as Alternative 4. Alternative 3 would not include any County or local efforts to manage the Bogue Inlet ebb channel in a manner like the 2005 relocation project, or otherwise, and no material will be used from the inlet for nourishment needs. The total volume of available beach fill from all other known feasible borrow sources would be just enough to meet the projected 50-year need of the 15-mile Atlantic Beach to eastern Emerald Isle reach to maintain beach profile sand volumes along the managed reaches at a 25-yr level of protection (LOP). Consequently, Alternative 3 would not provide any management of the ~ eight miles of beaches along central and western EI and Bogue Inlet reaches. Estimated implementation cost over the 50-year management period for Alternative 3 is ~ \$745 million, which considered the maintenance nourishment events, storm nourishment events, and the USACE Beach Disposal.

d.) Alternative 4- Nourishment and Non-Structural Bogue Inlet Management (Applicant's Preferred Alternative), (Chapter 3.3.4 of the FEIS). This alternative is described above, and is implemented under the BBMBNP. Estimated implementation cost over the 50-year management period for Alternative 4 is ~ \$787.9 million, which considered the maintenance nourishment events, storm nourishment events, and the USACE Beach Disposal.

e.) Alternative 5- Nourishment and Structural Inlet Management (Chapter 3.3.5 of the FEIS). Under Alternative 5, the County, through an interlocal agreement with all the island municipalities, would implement the 50-year beach nourishment project described under Alternative 3, with the addition of a structural Bogue Inlet management component consisting of a terminal groin on the west end of Emerald Isle (Figure 3.16). Nourishment parameters,

regimes, and volumes for the Pine Knoll Shores, Indian Beach/Salter Path, and Emerald Isle East management reaches, as well parameters for potential interim maintenance/supplemental storm nourishment of Atlantic Beach, would be the same as those previously described under Alternative 3 (Table 3.11). Furthermore, all sand sources for beach nourishment (i.e., Old and Current ODMDS, Area Y, AIWW disposal islands, and upland borrow sites) and associated methods of beach fill extraction would be the same as those described under Alternative 3. Alternative 5 would not include any efforts to manage the Bogue Inlet ebb channel through relocation or dredging. In the absence of Bogue Inlet ebb channel relocations as a sand source, the total volume of available beach fill from all other known feasible borrow sources would fall short of the projected island-wide 50-year need. Therefore, Alternative 5 would not provide for any sand placement on the ~8.0 miles of beaches along central and western EI and Bogue Inlet. However, Alternative 5 would attempt to reduce sand losses along these reaches through the construction of a 1,250-ft-long terminal groin along the shoulder of Bogue Inlet. The conceptual terminal groin design encompasses a 1,250-ft-long shore perpendicular stem/head segment extending seaward from the western end of Emerald Isle and a 600-ft-long “tie-back” anchor segment that extends landward along the back-barrier inlet shoreline in front of the existing homes before tying in to the Coast Guard bulkhead. The rubble mound (i.e., armor stone) component of the groin would have a variable crest width ranging from ~ seven to 15 ft and a variable base width of ~40 to 100 ft. Estimated implementation cost over the 50-year management period for Alternative 5 is ~ \$750 million, which considered the maintenance nourishment events, storm nourishment events, the USACE Beach Disposal, and the terminal groin.

In accordance with 40 CFR Section 1505.2(b), I have selected Alternative 4- Nourishment and Non-Structural Bogue Inlet Management, (Applicant’s Preferred Alternative) as the environmentally preferable alternative. The environmentally preferable alternative has been defined by the Council on Environmental Quality (CEQ) as “the alternative that causes the least damage to the biological and physical environment” and “which best protects, preserves, and enhances historic, cultural, and natural resources.” The evaluation of alternatives involved economic considerations, and the agency’s statutory mission to consider Public Interest Factors and to identify a Least Environmentally Damaging, Practicable Alternative (LEDPA). Reference Section 9.b.1 of this document for a detailed discussion on all alternatives and the selection of the LEDPA.

I have identified Alternative 4 as the LEDPA based on the project purpose, economic considerations and the environmental impacts associated with all alternatives. All other practicable alternatives would result in a higher economic cost than Alternative 4. The alternatives developed during the NEPA process are discussed in detail in Chapters 3 and 5 of the FEIS and Section 9(b) of this ROD. An explicit analysis of the projected environmental and socioeconomic consequences of each alternative is presented in Chapter 5.0 of the EIS.

6. Impacts of the Proposed Action and Avoidance, Minimization and Mitigation Measures

Impacts of the proposed action, including but not limited to impacts to waters of the United States, fish and wildlife resources, navigation, recreation, shoreline accretion and erosion are described below in Section 9 (404(b)(1) Analysis) and Section 10 (Public Interest Review). Also, Chapters 4 and 5.3.4 of the FEIS provide a full discussion of the environmental setting and consequences, respectively, associated with the proposed project. Comments received in response to the DEIS are identified and addressed in Appendix E of the FEIS; and comments received in response to the FEIS and public notice for the Clean Water Act and Rivers and Harbors Act permit application are discussed in Section 8 of this document.

a. Avoidance, Minimization and Mitigation Measures

Avoidance, minimization and mitigation measures are described in Chapter 6 of the FEIS. The measures include the following:

- Beach fill will be compatible with the native beach receiving the fill and in compliance with the North Carolina Coastal Resources Commission State Sediment Criteria Rule (15A NCAC 07H .0312) to minimize impacts to the aquatic ecosystem and nesting or foraging species.
- All dredging (offshore & inlet) and nourishment activities will be confined to working within a November 16 to April 30 environmental window to avoid peak biological activity.
- The following construction methods will be used to avoid and minimize impacts on environmental resources: proper placement, leak detection surveillance, and effluent reducers on pipelines; speed limits, DQM monitoring system, and proper rigid draghead sea turtle deflectors on the dredges; and limiting beach construction access points.
- A hydraulic cutter head dredge will be used during dredging operations associated with the ebb tide channel relocation of Bogue inlet and will operate only within construction windows and utilize positioning software to minimize impacts of sedimentation on aquatic life and aquatic habitats.
- The main borrow sources are existing offshore dredge and maintenance disposal sites and dredge cuts will be limited to the disposed material and not occurring within the original seafloor substrate.
- All terms and conditions of the U.S. Fish and Wildlife Service's (USFWS) State Programmatic Biological Opinion for Sand Placement will be incorporated as special conditions of any Corps authorization to minimize impacts to threatened and endangered species.
- As recommended by USFWS, conservation measures will be incorporated as special conditions of any Corps authorization to minimize impacts to threatened and endangered Piping Plover populations and red knot species when working within Bogue Inlet. Measures include restricting staging areas and pipeline locations to minimize effects on foraging and nesting habitat.
- Dredging contractors will be required to implement USFWS *Guidelines for Avoiding Impacts to West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters*.

- Construction of the project has been designed to reduce the frequency and volume amount of dredge and fill projects to a range from 3-9 year intervals, with the channel relocation work recurring every 10-15 years. By maintaining a 25-year LOP, the volume needs are expected to be lower and would result in a smaller maintenance footprint.
- Prior to each event, notification will be provided to USACE who will coordinate with the resource agencies to further determine if additional measures need to be considered. This notification acts as a form of adaptive management to review any unforeseen impacts and/or circumstances that should be addressed prior to conducting any work. This includes consultation efforts with the USFWS, National Marine Fisheries Service (NMFS), and/or any other Federal and State agencies.

7. Other Required Coordination and Authorizations

a. Cultural Resources

Remote sensing survey was conducted within the offshore borrow sites, ODMDS and Area Y by Mid-Atlantic Technology and Environmental Research, Inc. No submerged cultural resources or historic artifacts were identified during the investigations. All findings were compiled in the report, *An Archaeological Remote Sensing and Target Identification Survey of Bogue Banks Offshore Borrow Areas Q2, Y1, and ODMDS, Carteret County, North Carolina* dated 8 September 2011.

Consultation under Section 106, National Historic Preservation Act, has been concluded via coordination with the NC Department of Natural and Cultural Resources. By letter dated April 5, 2018, the State Historic Preservation Office (SHPO) responded to the FEIS and permit request by stating that they have no comments on the project. In the review of the project, SHPO revealed they are not aware of any historic resources which would be affected by the project, thus concluding consultation at this time. The DA permit will be conditioned to require that work cease in the event that any archaeological or historical resources are discovered. Such findings will require coordination with the SHPO prior to reinitiating further construction.

b. Endangered Species

The applicant provided a biological assessment dated August 2017. The Corps' determination for each identified threatened and/or endangered species in the Action Area is listed below (it should be noted that the determination for each species and critical habitat was coordinated with both USFWS and NMFS Protected Resources Division (PRD) prior to final determination):

NMFS Managed Species		
Species/Critical Habitat	Listing	Determination ¹
North Atlantic right whale (<i>Eubalaena glacialis</i>)	Endangered	MANLAA
Leatherback sea turtle (marine) (<i>Dermochelys coriacea</i>)	Endangered	MALAA
Loggerhead sea turtle (marine) (Northwest Atlantic DPS) (<i>Caretta caretta</i>)	Threatened	MALAA

Green sea turtle (marine) (North Atlantic DPS) (<i>Chelonia mydas</i>)	Endangered	MALAA
Hawksbill sea turtle (marine) (<i>Eretmochelys imbricate</i>)	Endangered	MANLAA
Kemp's ridley sea turtle (marine) (<i>Lepidochelys kempii</i>)	Endangered	MALAA
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered	MANLAA
Atlantic sturgeon (Carolina DPS) (<i>Acipenser oxyrinchus</i>)	Endangered	MALAA
Loggerhead Marine Critical Habitat		MANLAA
North Atlantic Right Whale Critical Habitat		NE
USFWS Managed Species		
West Indian manatee (<i>Trichechus manatus</i>)	Endangered	MANLAA
Piping plover (<i>Charadrius melodus</i>)	Threatened	MALAA
Red knot (<i>Calidris canutus rufa</i>)	Threatened	MALAA
Leatherback sea turtle (nesting) (<i>Dermochelys coriacea</i>)	Endangered	MALAA
Loggerhead sea turtle (nesting) (Northwest Atlantic DPS) (<i>Caretta caretta</i>)	Threatened	MALAA
Green sea turtle (nesting) (North Atlantic DPS) (<i>Chelonia mydas</i>)	Endangered	MALAA
Hawksbill sea turtle (nesting) (<i>Eretmochelys imbricate</i>)	Endangered	MALAA
Kemp's ridley sea turtle (nesting) (<i>Lepidochelys kempii</i>)	Endangered	MALAA
Seabeach amaranth (<i>Amaranthus pumilus</i>)	Threatened	MALAA
Piping Plover Wintering Critical Habitat		MALAA
Loggerhead Terrestrial Critical Habitat		MALAA
¹ NE = No Effect; MANLAA = May affect, not likely to adversely affect; MALAA = May affect, likely to adversely affect		

By letter dated September 12, 2017, the Corps requested concurrence from the USFWS and NMFS PRD and the initiation of formal consultation in accordance with the ESA of 1973 and 50 CFR 402. In addition, the Corps' entered the Section 7 consultation request with NMFS via their online Public Consultation Tracking System (PCTS) on September 12, 2017 with tracking number SER-2017-18882. The Corps determined that the proposed project would not affect any other listed species protected by the ESA. In the letter, a breakdown of role responsibilities between the Corps and BOEM was provided and it was disclosed in subsequent conversations that special conditions would further explain these responsibilities during the implementation of the applicant's BBMBNP. BOEM would be responsible for Section 7 consultation during dredging-only activities while using the borrow sources outside of the 3-nm limit, while the Corps' responsibilities will be centered on beach fill-only activities. For any dredging operations

occurring within the 3-nm limit and all associated nourishment, the Corps will have sole Section 7 coordination responsibility. This would include all work in Bogue Inlet.

In an April 2, 2018 response, the USFWS concluded formal consultation by concurring that nourishment activities under the BBMBNP would be covered under the August 28, 2017 Statewide Programmatic Biological Opinion (SPBO) for Sand Placement Projects provided the Reasonable and Prudent Measures (RPMs) and Terms and Conditions (T&Cs) are incorporated in the DA authorization. Since the SPBO addresses sand placement only, the USFWS recommended additional conditions to confront potential adverse effects to piping plover (wintering, migrating, and/or breeding), piping plover wintering critical habitat, and red knot from dredging in Bogue Inlet. These conditions are the following:

1. Dredging in Bogue Inlet shall not include shoals or other areas above the Mean Low Low Water (MLLW)
2. Pipeline Placement should avoid shorebird foraging, resting, and nesting habitat on the inlet shoulders and the west end of Emerald isle, to the maximum extent practicable. A distance of 100 feet or more from nesting shorebirds or shorebirds exhibiting breeding behavior (courtship, territoriality) should be marked in the field to assist in avoidance of these areas. Marking may include post and string and/or flagging. Any materials used for marking should be maintained until at least August 31, after which time the materials should be removed from the bench.

USFWS also made the recommendation that the ROD should note that “ESA Section 7 consultation should be reinitiated at least one year prior to any dredging or other work within or adjacent to Bogue Inlet”. All terms and conditions of the BO will be incorporated as conditions of any Corps authorization including any monitoring or mitigating requirements.

NMFS PRD responded by letter dated October 23, 2018. In their response, they disclosed that hopper dredging and relocation trawling components of the proposed project are likely to adversely affect green sea turtle (North Atlantic and South Atlantic Distinct Population Segments (DPS), loggerhead sea turtle (Northwest DPS), and Atlantic sturgeon (all 5 DPSs).

Consequently, the NMFS PRD enclosed a BO in the letter to cover the activities under an incidental take occurrence. All terms and conditions of the BO will be incorporated as special conditions in any Corps authorization for this project. NOTE: A draft copy of their BO was submitted by email dated August 14, 2018, which the District forwarded to the applicant for review. The applicant provided comments on BO and their response was provided to NMFS PRD on August 24, 2018 for consideration. NMFS replied with a response by email on August 30, 2018 to each of the applicant’s concerns. In turn, the applicant replied to their comments by email on September 5, 2018. A teleconference was held on September 6, 2018 to discuss the following issues at hand: the incorporation of the new SARBO once it is approved; NMFS analysis using the wrong cubic yards, which assisted in their Incidental Take (IT) limits; low numbers of IT limits with trawling; speed limit clarification for whales; and the protocol steps when an IT occurs. NMFS took this information, along with additional information provided by the applicant regarding cubic yards, and reassessed their overall take limits. NMFS provided a second draft BO via email on October 11, 2018, which was forwarded to the applicant the same

day. The applicant agreed to the IT limit change, and NMFS provide the signed BO on October 23, 2018 via email.

c. Essential Fish Habitat

The applicant completed an EFH assessment dated December 2017. By letter dated January 18, 2018, the Corps coordinated with the NMFS Habitat Conservation Division (HCD) in accordance with the Magnuson-Stevens Act. The Corps determined that the proposed project may have adverse impacts on EFH or associated fisheries managed by the South Atlantic or Mid Atlantic Fishery Management Councils of the NMFS. This determination was based on the project's description and the location of the project. The Corps anticipates that any effects of the project on EFH and federally managed fisheries would be minimized due to the temporary suspension of sediments in the water column at the construction site, environmental window of operations to avoid peak biological activity, recovery rates of the infaunal or benthic community, establishment of a dredging buffer to hardbottom communities, time and spatial scale of effects of each event, construction methods or practices, and use of compatible material. In the letter, the breakdown of role responsibilities between the Corps and BOEM was provided and it was disclosed in subsequent conversations that special conditions would further explain these responsibilities during the implementation of the applicant's BBMBNP. BOEM would be responsible for EFH issues during and post dredging-only activities while using the borrow sources outside of the 3-nm limit, while the Corps' responsibilities will be centered on beach fill-only activities. For any dredging operations occurring within the 3-nm limit and all associated nourishment, the Corps will have sole EFH coordination responsibility. This would include all work in Bogue Inlet.

In a letter dated April 2, 2018, NMFS generally agreed with the environmental commitments specified in the EFH Assessment, emphasizing the Corps: 1) to adhere to the identified seasonal restrictions for dredging to reduce impacts to EFH and vulnerable life stages of federally-managed fishery species and 2) to develop best management practices for dredging offshore borrow areas to facilitate rapid recovery of the benthic community. No EFH conservation measures were recommended outside of the EFH Assessment and the FEIS; however, NMFS HCD expressed the potential to add recommendations in the future based on new information or changes in the project design that show adverse impacts to EFH and/or federally-managed fishery resources.

d. Clean Air Act

Impacts to air quality associated with the project would be temporary and short term. The use of machinery for the dredging and beach fill activities would result in temporary increases in pollution to the ambient air, but the activities are not anticipated to affect compliance with the National Ambient Air Quality Standard (NAAQS). It has been determined that the activities proposed under this permit will not exceed *de minimis* levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action. Chapter 5.3.4.7 of the FEIS states that it is not expected that

any activities associated with the proposed project alternatives would significantly contribute to air pollution within the permit area.

e. Clean Water Act Water Quality Certification

The Clean Water Act provides that the applicant must obtain from the NC Division of Water Resources (NCDWR) a Section 401 water quality certification that the proposed discharge will comply with applicable effluent limitations and water quality standards before a 404 Clean Water Act permit is issued. NCDWR issued an Individual 401 Water Quality Certification on August 31, 2018 with additional conditions. The additional conditions will be included in the DA authorization.

f. Coastal Zone Management Act Consistency Determination

The Coastal Zone Management Act requires that the applicant obtain a permit from the NCDCM for the proposed project. The NCDCM issued a conditioned permit on September 4, 2018 finding that the proposed project is consistent with the enforceable policies of North Carolina's coastal management program and the Coastal Zone Management Act.

g. Relevant Presidential Executive Orders

- (1) EO 13175, Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians. This action would have no substantial direct effect on one or more Indian tribes.
- (2) EO 11988, Floodplain Management. Alternatives to work within the floodplain, minimization, and compensation of the effects are considered in Section 10 of this document.
- (3) EO 12898, Environmental Justice. In accordance with Title III of the Civil Right Act of 1964 and Executive Order 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin nor would it have a disproportionate effect on minority or low-income communities. Environmental Justice is discussed further in Chapter 5.22 of the FEIS
- (4) EO 13112, Invasive Species. There were no invasive species issues.
- (5) EO 13212 and 13302, Energy Supply and Availability. The project is not one that will increase the production, transmission, or conservation of energy, or strengthen pipeline safety.

h) Section 107 of the Rivers and Harbors Act of 1960, 33 USC 408 (Section 408)

Pursuant to Section 408, an evaluation must be performed in accordance with Engineer Circular (EC) 1165-2-216 to ensure that any project proposed within the footprint of existing federal projects must not interfere with the implementation of the federally authorized project. For the applicant's proposed BBMBNP, the action(s) has the potential to alter three Federal navigation projects, 1) Bogue Inlet, 2) the Atlantic Intracoastal Waterway, and 3) Morehead City Harbor, and ten USACE upland confined disposal facilities (CDF) in Carteret County.

The Regulatory Division initiated the Section 408 review via April 5, 2018 email to the Wilmington District Section 408 Coordinator. Based on the District's evaluation and as disclosed in the August 13, 2018 Memorandum For Record (MFR), the Wilmington District granted the applicant's request in accordance with 33 U. S. C. 408 to alter the aforementioned Federal projects for the following reasons: (1) the proposed action will not be injurious to the public interest, and (2) the proposed action will not impair the usefulness of the Federal projects. This approval was issued to the County by letter dated August 13, 2018 for which the County was informed that the applicant will be solely responsible for any remedial action needed to correct any deficiency in the design or construction of the requested alteration.

Although the proposed action includes the potential use of ten (10) USACE upland confined disposal facilities (CDF) in Carteret County, NC, this Section 408 approval does not apply to the CDFs. The Corps' process to obtain approval to utilize the CDFs can be found in the Memorandum dated February 3, 2017, SUBJECT: *Implementation Guidance for Placement of Dredged or Excavated Material in Federal Navigation Project Dredged Material Placement Facilities (DMPFs) by NonFederal Interests and Others Pursuant to Section 217(b) of the Water Resource Development Act of 1996, Public Law 104-303, as amended (33 U.S.C. § 2326a(b)), and Section 401 (c) of the Federal Water Pollution Control Act (the "Clean Water Act"), Public Law 92-500, as amended (33 U.S.C. § 1341(c))*. Additionally, since the USACE has perpetual easements on the CDFs, Carteret County must obtain a Consent prior to use of the CDFs if/when they are needed. A special condition of the permit will be included to ensure that the permittee must receive all proper approvals prior to the use of any CDFs.

i) Outer Continental Shelf Lands Act (OCSLA) of 1953

The OCSLA (43 USC 1331 et seq.), as amended by Public Law (PL) 103-426 (43 USC 1337), authorizes the BOEM to negotiate non-competitive lease agreements for the use of OCS sand, gravel, and shell resources in shore protection and beach restoration projects. Bureau of Ocean Management regulatory authority under the OCSLA applies to federal waters seaward of the 3-nm limit. As in described in the FEIS, the execution of non-competitive lease agreements for the extraction of beach fill from the OCS is a federal action requiring environmental review pursuant to the NEPA. BOEM, acting as a cooperating agency, has been involved in the NEPA review since the initial release of the NOI in 2010. The agency has determined that the preparation of a separate ROD under BOEM signatory authority will more sufficiently fulfill and satisfy the OCSLA requirements. All leasing agreements and permitting for mining sand will be completed separately from the Section 404/10 permitting authority and will be conducted solely by BOEM.

8. Consideration of Agency and Public Comments

The Corps received comments on the DEIS, FEIS and the PN for the DA permit application for the proposed action. Many comments were received in regards to the content of the DEIS, which resulted in editorial and factual changes to the document. The comments on the DEIS and PN for the DA permit application were fully addressed and all comments and responses can be found in Appendix E of the FEIS and throughout the body of the FEIS.

All FEIS and project request comments and our responses to the comments are listed below:

U.S. Environmental Protection Agency (EPA) provided comments by letter dated March 18, 2018: (Our below responses to EPA's comments were disclosed to their office during an August 10, 2018 telephone conversation between Ms. Maria Clark (EPA NEPA Coordinator) and Mr. Mickey Sugg of my Regulatory staff.

C-1 Comment: The EPA states that the FEIS did not address the technical recommendations from the DEIS concerning threatened and endangered species and hard bottom areas. They understand that the consultations are still ongoing with the relevant agencies, but it may be important to share with the public and other stakeholders prior to issuing the ROD any potential adverse impacts to protected species and environmentally sensitive resources.

Response: EFH consultation was initiated January 18, 2018 and was not completed until April 2, 2018, over a month after the release of the FEIS and the issuance of our local PN. Section 7 of the ESA formal consultation with USFWS & NMFS PRD was initiated in September 12, 2017 over seven months prior the FEIS release. USFWS findings were not submitted until April 2, 2018 when consultation was concluded; however, formal consultation with NMFS PRD remains on-going. Our consultation efforts have also been coordinated with the State of North Carolina, Division of Coastal Management. It is extremely difficult to determine the length of consultation and to time their completion around the completion and release of the FEIS. Adding to this is a desired construction schedule of the applicant's first renourishment event during the 2018/2019 dredging window. During the public commenting period, our office did not receive any public comments that relayed concerns with project effects to federally listed species and/or critical habitat or impacts to hardbottom habitat. Our intentions are to issue a PN announcing the completion of the ROD, but the results of the consultation efforts will not be released. In the PN, it will be disclosed that the ROD will be provided to anyone who request a copy.

C-2 Comment: The FEIS did not include a hydrodynamic evaluation or modeling analysis on the effects of the proposed dredging at the designated ODMDS. The FEIS provided some assumptions on the effects of ocean currents and wave actions at the site but the stated assumptions may not capture long-term variability of sand and sediment transport.

Response: The District uses the ODMDS on a continual basis as a disposal area associated with the maintenance of the federally authorized MCH project (known as Inner and Outer Harbor Areas). The management of the material for the federal project is outlined in the *Morehead City Harbor Final Integrated Dredged Material Management Plan and*

Environmental Impact Statement July 2015. It should be noted that the EPA designated the boundaries of the ODMDS in a final rule on 14 August 1987 (52 FR 30360), effective 14 September 1987, as an appropriate site for disposal. In conjunction with disposal use, the site also has been utilized as a borrow sand source over several decades to nourish beaches along Bogue Banks.

Although a modeling analysis was not conducted for the offshore ODMDS and Area Y sites, changes to water circulation patterns and hydrodynamics are anticipated to be minimal. Over the 50-year period, the mounds within sections of the ODMDS could be lowered -29 to -38 additional feet to an elevation depth of -52-foot NAVD88 (including a 2-foot overdredge depth); however, this dredging footprint will not expand below the original underlying seafloor. An additional 2-foot dredging buffer has been included to ensure that dredging doesn't encroach into the original substrate. Being over 3-nm from the oceanfront and dredging occurring only in a portion of the overall complex, any effects on ocean currents and wave conditions would be minor and localized. For Area Y, the ~7 to 13-foot dredging cuts should also result in minimal impacts.

C-3 Comment: EPA recommended a 30-year permit duration with a five-year review period "considering the known increase of seasonal events along the East Coast that consequently brings unpredictable variability to the project's assumptions" which could bring "greater possibility of unforeseen environmental impacts". They add that the biological, climatic, economic, and legal conditions will also likely change during this extended permit duration. With this change, EPA recommends a periodic (3, 5, 7 or 10 year interval) interagency review of project impacts, construction activities, and mitigation activities to validate assumptions made in the DEIS and FEIS.

Response: The applicant's approach in the development and design of the BBMBNP for a 50-year life was to coincide with the Federal 50-year CSDR and CSRM projects. In review of the applicant's request, the District doesn't see the benefit in changing the length of a DA authorization from 50 years to a 30-year duration. However, the District agrees with EPA that periodic reviews of the BBMBNP are essential in determining any unknown management effects. For this reason, DA authorization will be conditioned to require prior notification for each single event. During this notification, federal and state agencies will have the opportunity to evaluate each proposal and consider past BBMBNP projects in their review. Concerns, additional recommendations, project modifications, and/or objections will be addressed prior to authorizing the event. At any time in this review period, permit conditions can be added, modified, and/or revoked as deemed necessary, including minimization and mitigation measures. Additionally, if a full evaluation on the project's assumptions is needed, it will be determined during this time. This prior project notification will be included as a condition of the DA authorization and is expected to remain for the 50-year life of the BBMBNP.

C-4 Comment: EPA request a copy of the ROD for their records.

Response: Noted.

NMFS HCD provided comments by letter dated April 2, 2018:

C-1 Comment: The NMFS HCD requested the District to adhere to seasonal restrictions for dredging to reduce impacts to EFH and vulnerable life stages of federally-managed fishery species, and to develop best management practices (BMP) for dredging offshore borrow areas to facilitate rapid recovery of the benthic community.

Response: Environmental windows for offshore and inlet dredging will be restricted to November 16- April 30 for the length of the project. Notification will be required prior to undertaking any dredging and nourishment events, which provide additional agency coordination throughout the project's 50-year life. If, at any time, there are unexpected or unknown effects of dredging occurring to fishery resources, the dredging window can be modified to further protect those resources. BMPs for offshore dredging include limiting the dredge depth to the existing disposal mound for the ODMDS. A 2-foot vertical buffer will be incorporated in this dredging depth to prevent extracting any of the original substrate. A 2-foot vertical buffer is also included in the Area Y borrow site (50 acres) to ensure that the sandy substrate is maintained, not allowing the accumulation of fine material which is less favorable for the infaunal community. The excavation depths of Area Y also range from 7-11 feet deep, increasing the likelihood of quicker benthic recovery rates.

C-2 Comment: The FEIS incorporated most of the general and specific comments made by the NMFS on the draft EIS.

Response: Noted.

C-3 Comment: The FEIS states "Use of Area Y-75/80 borrow sites would require additional geotechnical investigations to verify that no hardbottom features are present in the proposed dredging footprint or within 500 meters of the proposed dredging footprint." The NMFS supports this statement and believes dredging near them could significantly affect valuable hardbottom habitat and artificial reefs.

Response: A Special Condition will be included in the DA authorization to prevent any dredging within this section of Area Y until a geotechnical investigation can substantiate whether hard bottoms are present or within a 500-foot buffer. All results of the investigation will be submitted to NMFS HCD for verification prior to any use.

C-4 Comment: Incorrect use of common names of fishes, which have been established by the American Fisheries Society, were found in the FEIS.

Response: Noted.

C-5 Comment: The EFH Assessment “adequately” describes the EFH in the project area and the federally-managed fishery species and the EFH conservation recommendation (e.g., work moratorium and hardbottom survey) typically issued for a project of this nature are already in the project design and conservation measures.

Response: Noted.

C-6 Comment: Specific Comments on the EFH Assessment. Page 26, The Red Drum is not managed under the Magnuson-Steven Act and accordingly, lacks EFH designation under the Act. Page 28, The Dolphinfish and Wahoo are managed by the SAFMC and should be included in 4.1.4. Page 30, The Butterfish is managed by the MAFMC, occurs in the project area, and should be discussed in this Assessment. Page 34, Second and third paragraphs, “mahi mahi” is a market/restaurant name, the correct name is Dolphinfish. Page 35, first and second paragraphs, gray trout is used instead of Weakfish. Page 35, Section 4.2.3 (Hardbottom and Artificial Reefs, there is no discussion on artificial reefs, just a figure. Page 36, third paragraph, “goby (*Loglossus calliurus*” is correctly known as Blue Dartfish (*Ptereleotris calliura*) and only one specimen has been documented in North Carolina waters. Delete. Page 61, Section 5.3, no discussion of artificial reefs even though it is in the heading.

Response: Noted. In regards to artificial reefs within the permit area, one known potential reef “area” was constructed in the early 1970’s using tires and an anchor system. Not a lot is known about the original construction of this reef system and was experimental in nature for disposing tires. Over the past decades, the reef’s anchor system has been heavily compromised and the tires have become disconnected and are loosely scattered over the seafloor. Tires are frequently washed ashore after storm events and are properly disposed at a landfill. This system is not recognized as an official reef site. Artificial Reef 342 is located outside of the larger Borrow Area Y boundaries, and at a further distance from the two identified suitable sites within Area Y. AR 342 well exceeds the 500-foot buffer by over a mile.

C-7 Comment: Based on the information provided, the NMFS has no EFH conservation recommendations for the project. The NMFS may provide EFH conservation recommendations in the future based on new information or changes in the project design that show adverse impacts would occur to EFH or federally-managed fishery species.

Response: Noted. The District is providing the coordination opportunity for future comments and discussions on unforeseen effects through the “notification process” that will be required prior to each single management event.

NMFS PRD provided comments by letter dated October 23, 2018

C-1 Comment: NMFS PRD analyzed the effects of the proposed management plan and determined that the hopper dredging and relocation trawling is likely to adversely affect green sea turtle, loggerhead sea turtle, and Atlantic sturgeon. Based upon this analysis, they issued a Biological Opinion to cover any incidental takes occurrence on any these listed species provided the RPMS and T&Cs are incorporated into the authorization(s).

Response: Noted. The District will include a Special Condition that all RPMs and T&Cs of the BO will be adhered to during the implementation of all single events under the BBMBNP.

USFWS provided comments by letter dated April 2, 2018

C-1 Comment: USFWS agrees that the project will be covered under the August 28, 2017, SPBO for Sand Placement Projects and that the RPMs and T&Cs must be incorporated into the authorization(s).

Response: Noted. The District will include a Special Condition that all RPMs and T&Cs of the SPBO will be adhered to during the implementation of all single events under the BBMBNP.

C-2 Comment: The USFWS recommended additional conditions to confront potential adverse effects to piping plover (wintering, migrating, and/or breeding), piping plover wintering critical habitat, and red knot from dredging in Bogue Inlet. These conditions are the following:

1) Dredging in Bogue Inlet shall not include shoals or other areas above the Mean Low Low Water (MLLW)

2) Pipeline Placement should avoid shorebird foraging, resting, and nesting habitat on the inlet shoulders and the west end of Emerald isle, to the maximum extent practicable. A distance of 100 feet or more from nesting shorebirds or shorebirds exhibiting breeding behavior (courtship, territoriality) should be marked in the field to assist in avoidance of these areas. Marking may include post and string and/or flagging. Any materials used for marking should be maintained until at least August 31, after which time the materials should be removed from the bench.

Response: The District will be including the noted recommendations as a Special Condition to the DA authorization.

C-3 Comment: USFWS also made the recommendation that the ROD should note that "ESA Section 7 consultation should be reinitiated at least one year prior to any dredging or other work within or adjacent to Bogue Inlet".

Response: District has included this in the ROD, however, it should also be noted that an unplanned emergency erosion response event as a result of a hurricane or other major storms may not afford the opportunity for an entire year to reinitiate Section 7 consultation.

C-4 Comments: USFWS reminds the Corps that several of the Conservation Recommendations, which are discretionary agency activities, have the potential for implementation to decrease direct and indirect impacts to listed and at-risk species. Some of the recommendations include planning projects outside of shorebird nesting season (prior to March 30); maintaining accreting sand spits; working with the applicant to develop local BMP to protect sea turtles, seabeach amaranth, piping plover, red knot, and other shorebirds; constructing

conservation/education display signs at beach access points; increase monitoring for Civil Works operations and maintenance projects; require the permittee to have authorization from USFWS for incidental takes associated with driving on the beach; require local municipalities to adopt lighting ordinances; require municipalities to implement leash-laws and predator control programs; and to work with local municipalities to identify and eradicate the invasive species of beach vitex.

Response: The District is including all the RPMs and T&Cs of the SPBO as condition to the DA and all single events that may take place within the 50-year life of the permit. For the additional Conservation Recommendations, which are implemented only at the discretion of the agency, the District fully understands the need to minimize the potential for adverse effects to any listed species and/or critical habitat to the maximum extent practicable. Many of the recommendations are beyond the scope of the project and our regulatory authority to enforce with the exception of the environmental window and impact minimization of sand spits. As noted above, permit conditions will be included to adhere to an environmental window and to avoid dredging shoals and areas above the MLLW line in Bogue Inlet.

North Carolina Department of Natural and Cultural Resources- SHPO provided comments by letter dated April 5, 2018

C-1 Comment: They conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

Response: Noted and the District will include an additional Special Condition of the permit to address any unknown or unforeseen resources that might be encountered during construction activities.

9. 404(b) (1) Analysis; 40 CFR Part 230

a. Factual Determinations (Chapters 3, 4 and 5 of the FEIS)

Pursuant to 40 CFR 230.11, the Corps must determine the potential short-term and long-term effects of a proposed discharge on the physical, chemical and biological components of the aquatic environment. These factual determinations shall be used in making a determination of compliance or non-compliance with the restrictions on discharge. The factual determinations are as follows:

(1) Physical Substrate Determinations. To fulfill the beach placement needs to a 25-year LOP, the BBMBNP identifies the following borrow sources: ODMDS, Area Y, Bogue Inlet, AIWW disposal islands, and upland sources. ODMDS, Area Y, and Bogue Inlet have ~14.2 Mcy, ~1.4 Mcy, and ~1.0 Mcy of material, respectively. The ODMDS is the designated disposal area for the federally authorized MCH and Beaufort Inlet navigation channel. The substrate within the borrow site consists of dredged material mounds from the federal projects that have been deposited over the original, natural substrate over several decades. A hopper plant will be used to cut depths to a maximum of 21 feet within the disposal mounds, removing

beach compatible material to be transported to the oceanfront shoreline. Material within the original softbottom substrate will not be dredged and a 2-foot dredging buffer will be placed above the original seafloor to provide additional protection to the original substrate. Beach compatible material from Area Y will be extracted via hopper dredge or cutterhead dredge plants at an average cut depth range of ~7 to 13 feet below the original seafloor. However, a 2-foot dredging buffer will also be included for Area Y to ensure there remains a sandy substrate for benthic recruitment. Impacts to the substrate will also be incurred with the Bogue Inlet ebb tide channel relocation work. The removal of the channel substrate via cutterhead plant encompasses a dredge footprint ranging from 40 to 75 acres to the depth of -18 feet NAVD88. The realignment frequency is estimated to occur once every 10-15 years, or a total of 3.5-5 events over the 50-year period. With the nature of the inlet and the monitoring data of the 2005 relocation project, infilling of the dredge area is expected to occur immediately and the dredged channel is expected to equilibrate within 6 to 12 months, restoring the softbottom substrate. Substrate impacts associated with offshore and inlet dredging are anticipated to be short-term and minimal.

There are ten AIWW disposal islands comprising a total of ~1.2 Mcy of compatible material to be used for shoreline management purposes. These islands were created mainly of material from AIWW maintenance events deposited over historic coastal marsh and small hummocks. The substrate, artificial in its origin, is sand material and will likely be extracted using a small cutterhead dredge. Impacts to disposal island substrate is expected to be minimal and short term.

Other proposed borrow sources include the use of six existing upland commercial sand mines that have been approved by North Carolina Division of Land Resources. To date, total available material is ~1.3 Mcy. All sites are currently in operation and have to comply with the conditions of the State Mining Permit.

Individual and cumulative effects to the affected substrates would be minimal and temporary.

(2) Water Circulation, Fluctuation and Salinity Determinations. The proposed project is not expected to have a long term or appreciable effect on salinity, temperature, or water chemistry within the water column at the offshore borrow areas, the inlet complex, or the oceanfront disposal area. Although a modeling analysis was not conducted for the offshore ODMDS and Area Y sites, changes to water circulation patterns and hydrodynamics are anticipated to be minimal. Over the 50-year period, the mounds within sections of the ODMDS could be lowered ~29 to 38 feet; however, this dredging footprint will not expand below the original seafloor. Being over 3-nm from the oceanfront and with dredging occurring only in a portion of the overall complex, any effects on ocean currents and wave conditions would be minor and localized. For Area Y, the ~7-13 foot dredging depth should also result in minimal impacts.

For Bogue Inlet, proposed channel realignment dimension specifications would be similar to those associated with the 2005 relocation project with the same hydrodynamic results. The 2005 project resulted in minimal changes to the tidal prism of the ebb and flood flow rates. These results were further tested in a model-simulated inlet realignment event under current inlet conditions and the results showed relatively minor effects, with a small overall decrease in average net flow in the flood direction. The results were comparable to those predictions

associated with the 2005 project. Based on the predicted tidal prism response, effects on estuarine salinity levels would be unlikely.

It is therefore my determination that individual and cumulative impacts to water circulation, flows, fluctuations and salinity will be short-term and minimal.

(3) Suspended Particulate/Turbidity Determinations. As described in Chapter 5.3.4.2 (Marine Water Column- Water Quality) and 5.3.4.5 (Inlet and Estuarine Resources- Water Quality), there would be a temporary increase in suspended particulates and turbidity levels in the project area during dredging and beach fill placement operations. However, these increases are anticipated to be short-term and localized with minimal adverse impacts to natural resources. The grains of well-sorted sand with a low silt percentage would allow for a short suspension time and containment of sediment during and after construction. The settling time for the sand grains would be shorter and thus, light penetration would return to normal shortly after construction is completed. For the offshore dredging work, hopper dredge plants do result in a higher rate of suspended particulates and turbidity as it reaches a full load, and these particulates can affect fish by entering into their gills and slowing oxygen exchange. However, the dredging window is expected to reduce these impacts since operations will be limited to a period when biological activity is at its lowest and mobile fish have the ability to avoid any sediment plumes. With the ODMDS being located 3-nm offshore and the consistency of the sediment, it is expected that the particulate and turbidity levels will have low suspension time in the water column and will likely be dispersed in the open water with less impact than closer sites. Also, best management practices, as identified in Chapter 6 of the FEIS and as will be required in permit conditions, would be employed to control the levels of particulates in the water column. Therefore, minimal impacts on the near shore and estuarine environments would be anticipated during construction. On August 31, 2018, the NCDWR issued the State 401 Water Quality Certification, which is conditioned that turbidity levels shall not exceed the State's standard of 25 Nephelometric Turbidity Units (NTU's). The conditions of the water quality certification would be incorporated into the DA permit.

For activities in Bogue Inlet, dredging will be conducted by an ocean certified cutterhead plant. These operating plants typically produce lower suspended particulates and turbidity levels than hopper dredge plants. Cutterhead dredges are anchored and stationary with only the cutterhead mechanism moving along the bottom of the substrate. Suspended sediment and turbidity will occur during maneuvers but it tends to be localized around the cutterhead as it operates. The consistency of the sediment being removed has a low silt/clay percentage (1.25%) and low suspension time in the water column and is expected to decrease the potential impacts resulting from turbidity. It is also calculated, via computer modeling, that the sediment suspension distribution will be limited to the main inlet complex, not extending into the surrounding tributaries of the Eastern or Western Channels and neighboring waters and salt marshes where there are known SAV and shellfish habitat. During the 2005 realignment projects, sediment monitoring showed that turbidity was well below the State Standard of 25 NTUs.

(4) Contaminant Determinations. Pursuant to 40 CFR 230.6(a) and (b), the Corps has determined that there is no reason to believe that contaminants are present in the project area. There are no known hazardous, toxic or radioactive wastes in the project area. The

substrate composition in the project area is comprised of coarse sand and, as a result, is unlikely to contain any toxic or hazardous substances. Any DA permit issued for this project will be conditioned to require clean fill.

(5) Aquatic Ecosystem and Organism Determinations. Individual and cumulative impacts to aquatic ecosystems and organisms are expected to be minimal and short-term based on the timing and frequency of the proposed impacts and the location of the impacts occurring in a dynamic resilient environment that is subject to periodic natural disturbance. During the disposal of dredged material, immediate localized impacts originating from the covering of substrate and the abrupt increased sedimentation at the disposal area may temporarily affect fish and benthic organisms present in the immediate work areas. However, this would likely not have any permanent appreciable effect on aquatic resources. Fish and other mobile species are expected to leave the project areas during construction to avoid any sediment plumes and return as the beach fill work migrates down the shoreline. Many infaunal species of the benthic community have the ability to tolerate being buried up to 10 cm and also tend to migrate offshore during the winter months. However, large portions of the oceanfront will receive greater depths of material and some placement work may extend into March and April when the presence of infaunal species begins to increase. Even though mortality is expected, it is also anticipated that the benthic community in surrounding unaffected areas would recolonize the habitat in the impact areas upon completion of the project, given that the disposed material will be consistent with the material currently on the shoreline. Impacts in the offshore and inlet areas will result in immediate removal of the benthic community present within the dredging footprint. As previously discussed, a 2-foot dredging depth buffer will be required to help sustain the sandy substrate/softbottom in order to increase the rate of benthic recovery. The dredging window will confine operations within the inlet to a period when species migrating through the inlet is at its lowest, particularly larval transport cycles. As discussed in Chapter 5.2 of the FEIS, many dredging and beach nourishment studies have shown that the timing, frequency, and the use of compatible material help reduce the effects to the marine and inlet aquatic ecosystem and increase the recolonization of infaunal species which is an important food source for the fishery resources.

(6) Proposed Disposal Site Determinations. The dredged material will be discharged in the Atlantic Ocean along ~18 miles of Bogue Banks oceanfront shoreline over a 50-year period at various intervals. These intervals range from every three to nine years, depending on the subject reach. At no time will any nourishment cycle on a single reach be less than 3-year frequency. Vibracore data have demonstrated that the material within the offshore borrow sites and within the realignment location complies with the NC Technical Standards in all categories when comparing to the native beach composition, thus resulting in compatible beach fill material. This level of compatibility would allow for a short suspension time and containment of sediment during and after construction. Beach placement construction methods form a berm to create a containment area around the discharge point to prevent direct discharge into the water column and to promote a settling area prior to entering into the receiving waters. As a result, the mixing zone will be confined to the smallest practicable area within the disposal site. Additionally, the Section 401 Water Quality Certification contains conditions for maintaining appropriate sediment and erosion control measures, which will be incorporated into

the DA permit. The disposal site is not expected to result in significant adverse environmental effects.

(7) Determination of Cumulative Effects. Cumulative impacts are the changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material. The effects determination considers the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. For the cumulative effect assessment for the applicant's BBMBNP, focus was given to significant coastal shoreline resources and the impacts associated with other similar inlet management, offshore dredging activities, and beach nourishment projects. The geographic scope of this assessment is limited to the shoreline along the NC coast and the timeframe included relevant actions occurring within the past 50 years, current projects, and projects that may take place in the next 50 years. The implementation of the BBMBNP is expected to result in minimal cumulative impacts to the aquatic environment for the following reasons: 1) frequency of events within the management plan, 2) expected recovery of resources after project actions, 3) construction practices to minimize effects, 4) adherence to environmental windows, 5) availability of adjacent undisturbed habitats to help sustain resources, and 6) presence of ~163 miles of undeveloped and protected shorelines along NC, which ~144 miles are under conservation, to provide habitat during any project recovery periods. Reference Chapter 5 and Appendix J of the FEIS for the full cumulative effects assessment. Potential cumulative impacts are expected to be minor.

(8) Determination of Secondary Effects. Secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. Secondary, or indirect, effects from the implementation of the BBMBNP are expected during the dredging operations within the offshore borrow sites and the inlet, as well as the beach placement activities along the oceanfront shoreline. These impacts have been previously discussed and are further discussed in Chapter 5.3.4 of the FEIS. Summary of the secondary effects include: 1) recolonization timeframe for the benthic community inhabiting softbottom and intertidal habitat that could affect foraging fish and other aquatic organisms feeding among the habitats, 2) increase of suspended particulates and turbidity which could interfere in oxygen exchange with fish, 3) shoreline changes within the inlet complex, and 4) increase in recreational use on the shorelines.

Environmental windows, material composition, research and past monitoring results, construction measures and practices, and the presence of undisturbed adjacent/surrounding areas are expected to reduce secondary effects to the aquatic environment. Potential impacts are expected to be minor and short term with each dredging, nourishment, and inlet realignment event.

b. Restrictions on Discharges

(1) Least Environmentally Damaging Practicable Alternative (LEDPA) and Practicability Evaluation. The 404(b) (1) Guidelines Restrictions on Discharge (40 CFR Part 230.10) specify that no discharge of dredged or fill material shall be permitted if there is a

practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem. Part 230.10(a) (2) defines practicable as “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose.” The determination of the LEDPA must be made without considering compensatory mitigation.

As stated in Section 3 above, the overall purpose and need of the County’s proposal is the following: 1) Establish a regional approach by consolidating local community resources, both financially and logistically, to manage Bogue Inlet and the beaches on Bogue Banks in an effective manner, 2) Provide long-term shoreline protection stabilization and an equivalent level of protection along Bogue Banks’ 25-mile oceanfront/inlet shorelines addressing long-term erosion, 3) Provide long-term protection to Bogue Banks’ tourism industry. 4) Provide short and long-term protection to residential and commercial structures and island infrastructure, 5) Provide long-term protection to the local tax base by the protection of existing and future tax bases and public access/use, 6) Maintain and improve natural resources along Bogue Banks’ oceanfront and inlet shoreline by using compatible beach material in compliance with the North Carolina State Sediment Criteria for shore protection, 7) Maintain and improve recreational uses of Bogue Banks’ oceanfront/inlet shorelines, 8) Maintain navigation conditions within Bogue Inlet, and 9) Balance the needs of the human environment with the protection of existing natural resources.

The following criteria were used to evaluate the reasonable alternatives as described above in Section 5: Shoreline response, cost, impacts to the aquatic and terrestrial environment, and protection of property and infrastructure. Reference Chapter 5 for a complete assessment of the projected effects associated with each alternative.

<p>Alternative 1- No Action Alternative, (Reference Chapter 5.3.1 and Appendix I of the FEIS for overall impact discussion).</p>	<p>This alternative would involve the continuation of the Federal projects within MCH and Bogue Inlet with sand placement along the western end of Emerald Isle, Atlantic Beach, and Fort Macon. It should be noted that placement within 7.2 miles of Pine Knoll Shores, Indian Beach, and Salter Path took place under the USACE Federal 933 Beneficial Use Project, which was a one-time event. Excluding the 933 Project, all Federal project nourishment events encompass ~ 6.6 miles of Bogue Banks. The MCH project would place ~ 1.2 Mcy every three years along 6.1 miles of Fort Macon and Atlantic Beach. With the Bogue Inlet project, ~ 0.5 mile of western Emerald Isle would be nourished with ~ 60,660 cy of material every 2-3 years.</p> <p>The County and/or local municipalities funded and initiated their first non-federal nourishment</p>
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project in 2002, which included three phases at a cost of \$30.6 million. This project was designed as an “engineered and maintained beach” project pursuant to Federal Emergency Management Agency disaster assistance eligibility requirements. Completion of this project facilitated three subsequent nourishment events in response to hurricane storms. These post-hurricane events, fully financed by FEMA, placed material within known “hotspot” erosive areas where structures were threatened and completed in 2004, 2007, and 2014.

With Alternative 1, single nourishment events would occur on an as-needed basis and/or as a response to storms, mostly within known “hotspot” erosive areas, which encompass ~ 7 miles. An annual loss rate of 90,542 cy was calculated for the combined hotspot reaches. Based on the annual loss rates and considering the mobilization & demobilization feasibility costs of nourishment, it is anticipated that the hotspot reaches (together) would be nourished with ~1.0 MCY of sand every 11 years (reference Table 3.2 of the FEIS). The actual frequency and volumetric extent of these projects would vary according to background erosion rates and the extent of shore protection degradation along specific reaches, as well as the frequency and extent of storm damage and the availability of local shore protection funding. However, in the absence of a long-term engineered and maintained beach nourishment project to maintain eligibility for FEMA public assistance reimbursement, it is assumed that FEMA- reimbursed storm response projects would not occur on Pine Knoll Shores, Indian Beach/Salter Path, and Emerald Isle. The implementation costs with each nourishment event would be incurred by the local municipalities with potential assistance from the County.

For Bogue Inlet management, the 2005 relocation of Bogue Inlet ebb tide channel was

	<p>a one-time project at a cost of \$10.9 million, and would be expected to occur again contingent on erosive conditions along the western shoreline of Emerald Isle. For impact analysis purposes and considering cost, it is assumed that at least two channel realignment events would occur over the next 50 years. For each event, the dredging channel footprint would be ~ 6,000 feet long by 150 to 500 feet wide with ~ 1.0 Mcy of dredge material placed along 5.5 miles of western Emerald Isle shoreline. This would likely be financed by Emerald Isle and/or the County.</p> <p>~ 25 properties on Bogue Banks currently have sandbags. Under Alternative 1, it is expected that additional sandbags would be installed over time by individual property owners to temporarily protect their homes, especially along the hotspot reaches. Likewise, the use of beach bulldozing would be anticipated, especially as a post-storm emergency measure to repair damage to frontal dunes and berms.</p> <p>With the absence of an “engineered and maintained beach” baseline, the applicant estimates 226 oceanfront properties are “at risk” over the next 50 years (refer to Chapter 5.1.1 for procedures outlining shoreline changes and determining “at risk” properties and Table 5.2 for complete break-down of properties per reach).</p> <p>The estimated economic cost with Alternative 1 over the 50-year project is \$819.8 million. This cost is comprised of \$392.8 million in lost property value based on a \$1.7 million average value of oceanfront property on the island, \$96.6 million in lost tax revenues, \$85.2 million in implementation cost with hotspot nourishment and the relocation of the ebb tide channel events, and \$245.2 million for the two federal projects.</p> <p>The placement of material in the 7-mile hotspot reaches and within the 5.5-mile reach</p>
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of western Emerald Isle would directly and indirectly impact oceanfront dry beach and dune habitat used by nesting sea turtles and various birds for resting; and oceanfront intertidal habitat used by the benthic community, and as foraging or feeding areas for shorebirds and fish (reference Chapter 5.2 Sand Placement for further discussion on general effects associated with material placed in these habitats). These impacts are similar to Alternative 3, 4, & 5 but would be less due to the greater frequency of Alternative 4 & 5. Sand bag installation would directly and indirectly impact these same habitats and likely adversely affect the use of the areas if replaced by sub-tidal aquatic habitat. Beach bulldozing would continue at a rate based on storm events. Dredging activity under Alternative 1 would take place within offshore borrow sites and in Bogue Inlet causing direct and indirect impacts on the soft bottom habitat, affecting the benthic community (a valuable food resource for fish). For Bogue Inlet, additional impacts are expected to affect the resting and foraging habitat of shorebirds, including impacts to the critical habitat for piping plovers. However, impacts would be less than Alternative 3, 4, & 5 due to the less frequency of two events over the 50-year period. Benefits from increasing the beach berm dry beach are expected for nesting sea turtle habitat with the use of compatible beach fill material.

This alternative is determined not practicable, as it would not meet the overall project purpose and need. The management of the shoreline would not involve the collective approach described in an interlocal agreement, resulting in each local municipalities seeking and financing their own shoreline protection. The County may likely have some involvement and financial commitment in each town's project, but without an interlocal agreement, this is more difficult to pre-plan and predict since most of the projects would be on an as-needed basis. Each project would undergo

	<p>separate Section 404/10 permit review processes, which would increase the level of uncertainty, difficulty and time in pre-planning and implementing a project. Although Alternative 1 would provide some level of shoreline protection, limited mostly to “hotspot” areas and along western tip of Emerald Isle, the protection and frequency is expected to be more short-term in nature and would leave structures and infrastructure more vulnerable over time. When compared to Alternative 4, the economic cost of Alternative 1 is greater and the level of protection over the entire Bogue Banks much lower of the 50-year period. Therefore, this alternative is not the least environmentally damaging practicable alternative.</p>
<p>Alternative 2- Relocation and Abandonment (No Action/No Permit Alternative), (Chapter 5.3.2 and Appendix I of the EIS).</p>	<p>As with all the alternatives, this option would involve the continuation of federal project beach disposal activities; however, with Alternative 2, no action would be taken to protect threatened homes and infrastructure under erosive conditions that would require Section 404/10 authorization. As structures are threatened, they would be demolished or relocated to existing non-threatened areas either on Bogue Banks or the mainland. Owners would have the option to install temporary sandbags and/or beach bulldoze provided the protective measures occurred above the mean high water line or outside of the Section 404/10 jurisdictional limits.</p> <p>Under Alternative 2, shoreline recession would continue unabated outside of temporary sandbags and/or beach bulldozing along most of Bogue Banks, especially at the “hotspot” locations. The 6.6-mile stretch of Atlantic Beach/Fort Macon and the western most portion would receive short-term and likely long-term protection via the Federal projects of MCH and AIWW. Individual homeowners would experience a larger expense in the</p>

	<p>demolition, relocation of homes, and/or purchasing of new lots. Infrastructure, including roads and utility lines would have to be relocated at the expense of the applicant.</p> <p>With the absence of shoreline protection in the remaining 18-mile stretch of oceanfront, the applicant estimates that unmitigated background and storm erosion would likely threaten 451 “at-risk” properties over the next 50 years (refer to Table 5.5 in Chapter 5 of the FEIS for the total properties per reach).</p> <p>The total economic cost associated with Alternative 2 is estimated to be \$886.5 million over the 50-year period. This loss encompasses the following: \$33.8 million for structure relocations or demolitions (~\$75,000/structure), \$489 million in losses to property value, \$118.6 million lost in property tax revenue, and the \$245.2 million incurred with the Federal projects.</p> <p>Impacts to the various habitats, such as intertidal, subtidal, water column, and soft bottom, would be less than all the other alternatives, including the Alternative 4, since the applicant would not be conducting any dredging or sand placement activities. However, effects of dredging and/or beach fill would continue with the implementation of the Federal projects. Additionally, no impacts to the inlet resources and habitats, which are important to shorebirds and migratory fishery resources (including larval transport), would be initiated by the applicant. This includes the critical habitat for the federally listed piping plover populations. Sea turtles in the water column would not be affected with the absence of dredging offshore or within Bogue Inlet. However, the 12-year modeling run resulted in an overall net loss of ~ 78 acres of oceanfront dry beach, reducing the quantity of nesting habitat. Therefore, the potential of Alternative 2 having a long-term negative effect on nesting sea turtles is greater than the other alternatives.</p>
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	<p>Alternative 2 would only address erosion on Bogue Banks along a 6.6 mile stretch of shoreline along Atlantic Beach/Fort Macon and the western tip of Emerald Isle through the MCH and AIWW Federal projects. Unabated erosion rates would continue along the remaining 18-mile reaches of Bogue Banks, including the inlet shoreline of Emerald Isle. This alternative would result in a substantial loss of property value and tax revenue, resulting in an unreasonable loss for the County, local municipalities, and individual property owners. Consequently, the option is not practicable for the applicant and does not meet the overall purpose and need.</p>
<p>Alternative 3- Nourishment Only (Including Federal Projects), (Chapter 5.3.3 and Appendix I of the FEIS).</p>	<p>The MCH and AIWW Federal projects would continue under Alternative 3. Like the Applicant's Preferred Alternative, the Nourishment Only Alternative includes an interlocal agreement to manage ~ 10 miles of oceanfront shoreline along three reaches: ~4.5 miles of Pine Knoll Shores, ~2.4 miles of Indian Beach/Salter Path, and ~2.5 miles of eastern Emerald Isle. No relocation of ebb tide channel in Bogue Inlet would be initiated by the applicant with the implementation of Alternative 3.</p> <p>Under Alternative 3, the 50-year management plan is designed as an "engineered and maintained beach" pursuant to Federal Emergency Management Agency disaster assistance eligibility requirements. The plan employs a recurring cycle of nourishment events to continuously maintain beach profile volumes along the designated reaches at a 25-year LOP. The recurring cycle varies at each reach with limits ranging from 3 to 6 year intervals. No reach would receive material less than 3-year intervals (reference Table 3.4 of the FEIS). Modeling results indicated appropriate volumetric triggers ranging from 211 - 266 cy/ft. along various reaches of the ~</p>

10-mile project shoreline (weighted average = 233 cy/ft.). The results also demonstrated rates of background erosional loss are expected to require recurring maintenance sand placement of ~0.2 to 0.5 MCY at the appropriate cycles for each reach. Based solely on background rates of erosion, the three managed reaches collectively are projected to require a total of ~10 MCY of maintenance material over the 50-year period. Additionally, for conservative planning purposes, estimated storm-related losses (based on the past three hurricanes) would require a volumetric placement of 1.7 MCY every three years totaling an additional ~27.2 MCY over the next 50 years. This results in the applicant's overall total need of 37.3 MCY for the life of the project. The borrow sources for Alternative 3 are the same as Alternatives 1, 4, and 5, with the exception of the ebb tide channel relocation.

Shoreline Protection efforts along central and western Emerald Isle would be absent, with the exception of AIWW placement along 0.5 miles. Model results show 122 oceanfront properties are projected to be "at-risk" for the 50-year life of Alternative 3 (refer to Table 5.8 in the FEIS for totals within each reach).

Storm-response nourishment requirements for the management reaches would be provided under the County/municipal 50-yr project through FEMA-reimbursed projects and/or additional nourishment projects fully funded by the County/municipalities in the case of non-reimbursable storm losses (including storm losses along Atlantic Beach, which does not meet FEMA engineered beach eligibility requirements).

Under Alternative 3, projected implementation cost for non-storm related nourishment events incurred by the applicant is estimated ~\$140.4M over the 50-year period. Cost for storm losses, which are eligible for federal reimbursement monies via FEMA, are

estimated at \$360.4M. Possible cost to the applicant for all nourishment events could reach ~\$500.8 million if FEMA funds were not available. Other costs include ~\$212.1 million in estimated lost property value; ~\$48.2 million in lost tax revenue; and \$245.2 million associated with the MCH and AIWW federal projects. Total economic cost, excluding FEMA reimbursement, incurred with Alternative 3 is ~\$1.006 billion over the 50-year life of the project.

Nourishment placement activity along 10 miles would result in similar direct and indirect impacts to the oceanfront environment (soft bottom, water column, intertidal, and dry beach habitat) as described in Alternative 1. However, the cumulative impacts associated with Alternative 3 is expected to be higher than Alternative 1 due to the increased frequency and spatial placement of the total events for the 50-year period. Offshore dredging operations would also be more frequent than Alternative 1, but similar to Alternative 4 and 5 for the three reaches. However, Alternative 3, like Alternative 2 & 5, would not encompass any dredging by the applicant within Bogue Inlet.

Excluding Bogue Inlet as a sand source, the total volume of available beach fill from all other known feasible borrow sources would be just enough to meet the projected 50-year period for Alternative 3. The Nourishment Only Alternative, as financed by the applicant, would provide adequate short- and long-term protection at a 25-year LOP for those properties located within the designated 10-mile oceanfront project area. If all storm-related nourishment was fully reimbursed by FEMA, then the management of the 10-mile stretch would be practicable. However, the properties in the 8.0 mile stretch of western, central, and Bogue Inlet reaches of Emerald Isle would remain vulnerable to chronic erosion. Additionally, the properties along the inlet shoulder of Emerald Isle would be highly

	<p>susceptible to erosion as the ebb tide channel moves easterly as expected. Alternative 3 is not the least environmentally damaging practicable alternative for managing the entire island and fulfilling the overall purpose and need.</p>
<p>Alternative 4 - Nourishment and Non-structural Bogue Inlet Management (Applicant's Preferred Alternative), (Including Federal Project), (Chapter 5.3.4 and Appendix I of the FEIS).</p>	<p>This alternative is similar to Alternative 1 in the fact it involves using the same borrow sources and managing Bogue Inlet via relocation of the ebb tide channel. It is similar to Alternative 3 & 5 with the inclusion of an interlocal agreement and a 25-year LOP for portions of the oceanfront shoreline. Like Alternatives 1, 2, 3, & 5, the MCH and AIWW federal projects would also continue to place material along 6.6 miles under this option. The difference with the Alternative 4 management approach is it combines nourishment events and the management of Bogue Inlet to provide a 25-year LOP for the oceanfront shoreline within the remaining ~18 miles of the island not managed by federal projects. When combined with the federal projects, this management plan would essentially cover the entire island of Bogue Banks.</p> <p>With Alternative 4, an additional ~4.3 MCY of material from Bogue Inlet will be available to offset background erosion for the 8-mile Bogue Inlet, western, and central Emerald Isle reaches (not covered in Alternative 3 or 5) at intervals of six (Bogue Inlet) and nine years (western and central). This supplemental material will provide the 25-year LOP and maintain the eligibility for FEMA reimbursement funds to address storm-related losses. The sand placement volume and frequency for the other ~10-mile stretch of reaches would be the same as described in Alternative 3, ~0.2 to 0.5MCY at intervals of three or six years to offset background erosion (reference Table 3.8 of the FEIS).</p> <p>The ebb tide channel of Bogue Inlet will be</p>

maintained within the boundaries of a designated “safe box”. The channel would be allowed to freely migrate within this boundary until it migrates beyond the eastern limit of the “safe box”, triggering the need for a maintenance relocation event in order to protect the structures along the inlet shoulder. Results from modeling, empirical, and analytic assessments demonstrate the need to conduct a dredging realignment every 10 to 15 years.

The implementation of Alternative 4 is expected to adequately provide and maintain protection against chronic erosion for the ~18-mile stretch of reaches at a 25-year LOP. This expectation projects no “at-risk” properties within the subject reaches.

The County’s nourishment and channel relocation events under the Applicant’s Preferred Alternative would incur an implementation cost estimated at \$542.8 million. An additional \$245.2 million would be associated with the MCH and AIWW federal projects, bringing the total cost to \$787.9 million over the 50-year life of the project. No economic loss to property values or tax revenues are anticipated with Alternative 4.

By maintaining a 25-year LOP, the oceanfront environmental effects, including the offshore borrow sites, are similar to those of Alternative 3 for the ~10-mile stretch of reaches. The frequency and volume of each nourishment are identical; however, Alternative 4 extends the beach fill placement an additional ~8.0 miles. Impacts to oceanfront habitat, including offshore soft bottom habitat, from the Applicant’s preferred is expected to be more than the other options due to higher frequency and larger footprint of disturbance. However, nesting sea turtles are expected to receive a greater benefit from this alternative due to sustaining a critical nesting dry beach and dunal system, especially along the “hotspot”

	<p>reaches. Modeling results for Alternative 4 show a 53-foot wider dry beach and dune community than that of Alternative 2, whereas Alternative 3 is 40 feet wider than Alternative 2.</p> <p>Effects from offshore and inlet dredging is expected to increase with Alternative 4. Sea turtles in the water column will be more vulnerable with the higher frequency use of hopper dredges offshore. Inlet habitats affected during the channel relocation is similar to Alternative 1, but would occur at a higher frequency. With an increase of relocation events at once every 10 to 15 years, the spatial time between each event is such that any potential dredging effects is expected to fully recover as to not result in cumulative impacts on any fishery resources and migration, including larval transport, and/or bird resource, including critical habitat for piping plover populations. It should be noted that benthic community and shorebird/water bird population monitoring survey demonstrated full recovery within the 3-year study.</p> <p>The relocation activity within Bogue Inlet is anticipated to provide improvements to navigation for smaller vessels, as was experienced in the post-realignment conditions of the channel during the 2005 project.</p> <p>When evaluating the overall project purpose and need, the management approach under Alternative 4 is determined to be practicable. The nourishment regime and the non-structural management of the inlet is the only option that is expected to adequately provide and maintain a 25-year LOP against chronic erosion for the entire ~18-mile stretch of reaches. Although there is an increase in certain environmental effects over some of the others, especially Alternative 2, Alternative 4 remains the only alternative that results in no "at-risk" properties and has the least economic cost over the 50-</p>
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	<p>year project life for Bogue Banks. Like Alternatives 3 & 5, an interlocal agreement for Alternative 4 outlines the management arrangements among the County and the four local municipalities in the nourishment activity distribution to maintain shoreline protection integrity for the entire island. Otherwise, the County and each municipality would be independent in their request for oceanfront and inlet stability, like Alternative 1, resulting in an inefficient management of time and financial resources for the overall protection of the island. Therefore, Alternative 4 (Applicant's Preferred), is considered the least environmentally damaging practicable alternative in meeting the overall purpose and need.</p>
Alternative 5- Nourishment and Structural Inlet Management (Chapter 5.3.5 of the FEIS).	<p>Like Alternatives 3 & 4, Alternative 5 includes an interlocal agreement between the County and all local municipalities. This provides the same cohesive island approach in shoreline protection. As with all the other alternatives, the MCH and AIWW federal projects will continue to place material along the 6.6 miles of Atlantic/Fort Macon and western tip of Emerald Isle shorelines. Management plans for a 25-year LOP under Alternative 5 are the same as the designated ~10-mile stretch of reaches described in Alternative 3, including the frequency and volume of nourishment for each reach (refer to Table 3.11 of the FEIS). But also like Alternative 3, there is a shortfall of feasible borrow sources for the remaining ~8.0 mile stretch of western, central, and Bogue Inlet reaches of Emerald Isle since the alternative excludes any ebb tide channel relocation of Bogue Inlet.</p> <p>For the properties and shoreline along the inlet shoulder of Emerald Isle, Alternative 5 involves the construction of a terminal groin. This approach consist of installing a 1,250-foot long rubble mount structure perpendicular to the shore and based on the 2015 shoreline position, it will extend 550 linear feet below</p>

	<p>the mean high water line. The structure will be placed along the back barrier inlet shoreline in front of the existing homes and will tie into the U.S. Coast Guard bulkhead to prevent erosional flanking of the anchor. One of the proposed borrow sources or the AIWW federal project will provide the material to create the groin's fillet. Maintenance material for the fillet is expected to come from the federal dredging of the AIWW, which places the material along a 0.5 mile section from the inlet shoulder.</p> <p>In the absence of shoreline management along most of Bogue Inlet reach and western and central Emerald Isle reaches, modeling results show that unmitigated background and storm erosion would cause 103 properties to be "at-risk" over a 50-year period (refer to Table 5.13 for total properties per reach)</p> <p>Over the 50-year project period, it is estimated that the total cost for Alternative 5 is \$970 million. This incorporates a \$500.8 million implementation cost for the applicant sponsored nourishment events, a \$4.4 million cost for construction of the groin, \$179 million in lost property value, \$40.7 million in lost tax revenues, and the MCH and AIWW cost of \$245.2 million.</p> <p>Alternative 5 would result in the identical direct and indirect dredging and beach fill impacts within offshore borrow sites and oceanfront shoreline habitats as shown in Alternative 3 for the managed ~10-mile stretch of eastern Emerald Isle, Indian Beach/Salter Path, and Pine Knoll Shores. It will also provide the same benefits to nesting sea turtles. However, this alternative has additional effects associated with the construction of the terminal groin along the Bogue Inlet shoulder of Emerald Isle. The footprint structure will permanently result in the loss of ~0.2 acre of intertidal beach habitat and ~0.3 acre of dry beach habitat. With the longshore transport</p>
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	<p>being east to west, the modeling shows indirect affects to the intertidal zone with accretion occurring within ~22 acres. This accumulation of sediment will occur over time and the inhabitant benthic community is expected to adjust and acclimate to the change since the community has the natural ability to tolerate fluctuations in this constantly changing environment. Modeling results indicate minimal effects with longshore sediment transport from the ebb tide delta into the inlet and doesn't indicate any effects on the east end of Bear Island located on the western shoulder of Bogue Inlet.</p> <p>When compared to all the alternatives, Alternative 5 provides a greater shore- and long-term protection to more properties on Bogue Banks than all the options except Alternative 4. Its economic loss to property and tax revenue is lower than Alternatives 1 & 2, but carries a higher total cost if FEMA reimbursement wasn't available. Presuming FEMA reimbursement is fulfilled for all storm-related beach fill events, then Alternative 5 would be less costly than Alternatives 1 & 2, as well as Alternative 3 which cost total are also predicated on FEMA funds. In comparison to Alternative 4, the Nourishment and Structural Inlet Management has a much greater economic loss in property values and tax revenues and incurs a higher total cost exceeding \$180 million over a 50-year period. For this reason, Alternative 5 does not meet the overall project purpose and need.</p>
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In analyzing the alternatives, each one was evaluated for its capability of fulfilling the overall project purpose when considering the cost, existing technology, and logistics. There are no technology or logistical restrictions with the implementation of any of the alternatives. However, the element of cost was the major limiting component in determining the practicability of each alternative in light of the project purpose. Alternative 1 was not practicable due to its high cost and limited short-term shoreline protection, while Alternative 2 carried the highest cost in lost property value and tax revenue of all the alternatives and incurred a total cost higher than Alternatives 1 and 4. If FEMA reimbursement was fulfilled for storm-related events, Alternative 3 and 5 would meet the long-term protection need for a 25-year LOP over the 50-year period.

However, the fulfillment of this need would be limited to only a 10-mile stretch of Bogue Banks, having a ~8.0 mile shortfall of protection. For Alternative 4, the economic cost of the option is much less while providing a 25-year LOP for ~18-mile stretch of Bogue Banks that is not being maintained by any of the federal projects. The implementation of Alternative 4 is expected to impact, directly and indirectly, a larger footprint of oceanfront, marine, and inlet habitats and at a higher frequency than Alternatives 1, 3, and 5. However, the time and spatial gap of each event is not expected to result in any cumulative impacts. For the recurring frequency of every 10 to 15 year in relocating the ebb tide channel, any cumulative impacts to the aquatic and terrestrial environment is anticipated to be non-appreciable. Alternative 4 remains the only alternative plan that results in no “at-risk” properties and has the least economic cost over the 50-year project life for Bogue Banks.

Therefore, Alternative 4- Nourishment and Non-structural Inlet Management (Applicant’s Preferred) is considered the LEDPA in meeting the overall project purpose and need.

b. Degradation of Waters of the United States

The 404(b) (1) guidelines state that the Corps may not issue a permit if it will result in significant degradation to the waters of the US. Under these guidelines, effects contributing to significant degradation, considered individually or collectively, include:

1. Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites;
2. Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes;
3. Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or
4. Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.

The affected environment and the potential impacts, both direct and indirect, have been thoroughly examined in the FEIS. The likelihood and magnitude of these impacts are further discussed above in Section 9. The proposed project will not involve the discharge of fill material into special aquatic sites, as defined in 40 CFR part 230, Subpart E. The project as proposed will have minimal impacts to human health and welfare, aquatic life, aquatic ecosystems, recreation, aesthetics and economics. Aquatic life, particularly infaunal species, will either be killed during the construction of the project or will relocate to unaffected areas of the shoreline during construction. All aquatic life will return upon completion of the project. Beach compatible sand will be used in the disposal area and the intertidal and surf zone habitats will remain upon completion of the project. The project will have minimal and short-term impacts to recreation,

aesthetics and economic values. Impacts to recreation, aesthetic and economic values are further discussed in Section 10 of this document.

After consideration of the above factual determinations, in light of the information contained in the FEIS and the overall record for this case, it is my determination that with the implementation of the attached Special Conditions, authorization of Alternative 4 (Beach Nourishment and Non-Structural Inlet Management/BBMBNP) will not cause or contribute to significant degradation of the waters of the US.

c. Avoidance and Minimization of Impact

Avoidance and minimization efforts are described in Chapter 6 of the FEIS and in Section 6 of this document. Pursuant to 40 CFR Part 230.10(d) I have considered whether all appropriate and practicable steps have been taken to minimize potential adverse effects to the aquatic ecosystem. Also, in accordance with the 1990 Memorandum of Agreement between EPA and the Corps regarding the determination of mitigation under the Clean Water Act 404(b)(1) guidelines, I have first considered avoidance through the determination of the least environmentally damaging practicable alternative and then considered further steps to minimize impacts to the aquatic environment. Any permit issued for this project will include special conditions to ensure that impacts to the aquatic resources are minimized.

I find that, with the minimization measures discussed above in Section 6 of this document, the applicant has taken all appropriate and practicable steps to minimize adverse impacts to the aquatic ecosystem.

10. Public Interest Review

All public interest factors have been reviewed as summarized here. Both cumulative and secondary impacts on the public interest were considered. The Public Interest Factors are discussed below.

				+ Beneficial effect
				0 Negligible effect
				- Adverse effect
				M Neutral as result of mitigative action
+	0	-	M	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Conservation.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Economics.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aesthetics.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General environmental concerns.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wetlands.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Historic properties.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fish and wildlife values
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flood hazards.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Floodplain values.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Land use.

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Navigation
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Shoreline Erosion and Accretion
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recreation
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water supply and conservation.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water quality
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Energy needs
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Food and fiber production.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mineral needs
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Considerations of property ownership.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Needs and welfare of the people.

a. Conservation.

The 265-acre Theodore Roosevelt Natural Preserve is located on the north side of Salter Path Road in Pine Knoll Shores and is one of the largest protected maritime forests in NC. The proposed project will provide additional protection from storms by maintaining a 25-year LOP that will help in preserving the forest.

b. Economics

The implementation of the BBMBNP over the 50-year project life would incur an estimated total cumulative cost of ~\$787.9 million, which is ~\$30 million less than the next least cost alternative and ~\$180 million less than the alternative that protects the second most number of properties. This total cost for Alternative 4 includes the estimated ~\$360 million that could be potentially reimbursed by FEMA for storm related projects. If full FEMA reimbursement was granted for storm events over the life of project, then the estimated total economic cost would be reduced to ~427.5 million. The execution of the management plan would provide short- and long-term enhancement to beach width and quality and would convey additional economic benefits associated with tourism and recreation. The BBMBNP is expected to provide a host of benefits, including long-term infrastructure protection, enhanced beach width and volume, and enhanced recreation opportunities for the public. Associated benefits and enhancements are likely to include increased rental revenues and higher tax revenues. Each event will provide a slight increase in employment opportunities during the construction operations. On-site jobs would be directly related to the construction of the project, but off-site job opportunities would potentially be increased due to the stimulation of commercial activities during the non-tourist season, particularly service-related businesses in the project vicinity.

As a result of this project, the applicant's tax base would be maintained or increased due to a potential increase in tourism, recreation and property values. The 50-year management plan will strengthen the shoreline to a 25-year LOP which increases property protection against higher category storm events. This level of protection is expected to reduce the effects of such storms and will assist in a quicker economic recovery period.

c. Aesthetics

Heavy machinery will be operating on the beach during construction of the project and pipelines and other equipment will be present within the work zone. The heavy machinery would result in temporary increases in noise during a full 24-hour period. Also, the presence of the equipment would cause an obstruction of the ocean vista. The noise effects are temporary in nature since the equipment continues to migrate down the oceanfront as the beach is constructed. The presence of the pipeline will likely be visible at a single location for a longer period, especially for those properties located at the initial starting point of the beach fill work. Aesthetic effects from noise and visual obstructions will be limited to permanent residents since the work will be undertaken during the winter months.

An aesthetic benefit from the completion of events will be an increase in beach area and stabilization of the shoreline. Impacts to aesthetic values are expected to be negligible and short-term. Reference Chapter 5.3.4.7 of the FEIS for more information on aesthetic and project related impacts.

d. General environmental concerns

Chapter 5.3.4 of the FEIS discusses general environmental consequences of the proposed action. The project could affect neighboring communities, recreation, and fish and wildlife values, including threatened and endangered species. Impacts to recreation, fish, wildlife and neighboring shorelines are further discussed throughout the FEIS and in Sections 9 and 10 of this document. Special conditions will be added to any authorization to require compliance with the terms and condition of the signed USFWS' SPBO and NMFS' BO.

e. Wetlands

There are no wetlands or any other special aquatic sites located within the project area. No wetlands will be directly or indirectly impacted with any facet of the 50-year management plan.

f. Historic properties

As described in Section 7.a. of this ROD, the project will not affect any historic or cultural resources that are listed or eligible for listing in the National Register of Historic Places. The permit will include conditions that require consultation with the SHPO in the event that the project affects resources during construction. In a letter dated April 5, 2018, the SHPO responded to the FEIS and permit application request and stated that they have no comments on the project.

g. Fish and wildlife values

As previously mentioned, foraging habitat and food sources for fish species, particularly bottom-feeders, will be affected by the offshore and inlet dredging and the placement of beach fill in the intertidal zone. Additional effects from suspended particulates and turbidity associated with project operations may impair pelagic fish and inlet migrating species. Hardbottom habitat, an

important fishery resource and designated EFH, will be avoided and a buffer of 500 meters (1,500 feet) will be set for any dredging. Impacts to foraging, nesting, and resting habitat and behavior of bird resources is projected as result of beach fill placements and inlet dredging. As with fish, the benthic community is an important food source to shore and water birds and will experience a level of mortality for temporary period of time. For both fish and bird species, any potential impact to the foraging, resting, and/or brooding behavior is anticipated to be short term and minimal due to the localization of impacts, adjacent undisturbed foraging habitat, ability to avoid impacted areas, recolonization rate of infaunal species, environmental windows, construction methods, past monitoring and studies, and the use of compatible material. These impacts, expected recovery timeframes, and avoidance/minimization measures are further discussed in Chapter 5 and 6 of the FEIS.

The USFWS concurred that nourishment activities detailed in the BBMBNP would be covered under the August 28, 2017 Statewide Programmatic Biological Opinion (SPBO) for Sand Placement Projects for federally listed species that may be adversely affected by the project. All terms and conditions of the BO will be incorporated as special conditions in the DA authorization. Additionally, the DA permit will be conditioned to require the implementation of the *USFWS' Guidelines for Avoiding Impacts to the West Indian manatee* in order to minimize potential effects to the species.

NMFS concurred that all hopper dredge and relocation trawling activities would be covered under the October 23, 2018 Biological Opinion (BO) for federally listed species that are likely to be adversely affected by the project. All terms and conditions of the BO will be incorporated as special conditions in the DA authorization.

The project would occur in EFH, but impacts would be minimal and temporary. The proposed project will include dredging in Bogue Inlet. By letter dated January 18, 2018, the Corps coordinated with the NMFS in accordance with the Magnuson-Stevens Act. The Corps determined that the proposed project would adversely affect EFH but the effects would be temporary and due largely to the dredging of softbottom offshore and within the inlet and also due to temporary suspension of sediments in the water column at the excavation and nourishment site. In a letter dated April 2, 2018, NMFS concurred that impacts would be temporary provided all the measures in Chapter 6 of the FEIS were implemented and that additional geotechnical survey within Borrow Area Y-75/80 confirmed no presence of hardbottom within 1,500 feet of the dredging footprint. They concluded that the activity is not expected to adversely impact EFH and they offered no additional conservation recommendations.

The BBMBNP is designed to maintain a dry beach and dune system along ~18 miles of Bogue Banks reaches. The enhancement of the oceanfront shoreline will allow a wider beach to benefit nesting sea turtles. The use of compatible material to the native beach will ensure that sediment substrate continues to be suitable for digging, laying, and incubating young.

Any potential individual and cumulative impacts to the fish and wildlife values are expected to be short-term and minimal with the inclusion of all the conservation recommendations from the resource agencies coupled with the avoidance and minimization measures specified in Chapter 6 of the FEIS and in the Special Conditions of the DA authorization.

h. Flood hazards and Floodplain values

As directed by Executive Order (EO) 11988, agencies shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare and to restore and preserve the natural and beneficial values served by floodplains. The proposed project involves work within the 100 year floodplain. However, the proposed project may reduce potential flood damage from storm surges and wave activity from the creation of a wider beach. Flood storage reduction is not expected to occur from the filling of waters of the United States. Flood hazards to properties on the shoreline are expected to decrease with the construction of the project and the increase in beach width. The shoreline would expand seaward and the profile of the beach is expected to increase in elevation as a result of the project, which would allow for more protection of the shorelines and properties during storm events. Dune systems would not be negatively affected as a result of the project and may be beneficially affected as the shoreline stabilizes waterward of the dune systems.

If any floodplain permits are required by any local entities, the applicant will be required obtain the authorizations prior to commencing work.

i. Land use

Some restrictions to the use of public waters will be associated with the various aspects of the BBMBNP. These restrictions include certain navigability access within Bogue Inlet during channel realignment events and within the designated offshore borrow sites during hopper dredge use for beach fill events. Both restrictions, or limitations, are for safety reasons. Only during the Bogue Inlet operations, the restriction would be a stationary location around the dredge plant and this area would be outside the existing channel at the time. The use of the offshore borrow areas would only be limited during the actual dredging activity as the hopper dredge enters into the dredge zone. Once the plant is full and leaves to dispose the material on the beach, the borrow area is available without any project related safety concerns.

Public use of the oceanfront will be restricted/limited during beach fill activity. This restriction zone is centered at the discharge point of the pipeline and where heavy equipment is shaping the material as it exits the pipeline. The designated area is marked with stakes and flagging tape and provides a safety zone to prevent injury to the public.

Depending on the nature of the event, project construction can range from 3 to 6 months and temporary land use restriction/limitation(s) to the public would be contingent on the constructed activity. Land use effects associated with BBMBNP would be consistent with other beach nourishment and inlet projects of the past and the project will not adversely affect the land use along the shoreline and waters of Bogue Banks and Bogue Inlet. Benefits to land use is expected as a result of a larger and wider beach and the deepening of the ebb tide channel, thus maintaining the land use of the barrier island.

j. Navigation

The execution of the BBMBNP will take place in navigable waters of the United States, both along the oceanfront and within the inlet. Negative impacts to navigation will take place during construction due to the presence of dredge plant(s) and associated pipelines. These limits to navigation will be restricted to the footprint of the structures, with the exception of a safety buffer around the stationary cutterhead dredge working in the inlet. For Bogue Inlet, the dredge will be working mostly outside of the main federally authorized ebb tide channel so boats are unlikely to encounter navigation obstacles to most areas within the inlet. Realignment construction period is ~ 3 months and will take place when inlet navigation use is at its lowest. These during-construction impacts are expected to be negligible due to the availability of surrounding navigable waters and work outside of the main channel. Upon completion of the channel relocation, there is an expected benefit to navigational interests with the deepening of the channel to -18 feet NAVD (including overdredge depth). The new channel will undergo an adjustment period of up to 6 months, but will maintain the benefit to navigation beyond that period.

The applicant will be required to contact the NOAA/National Ocean Service (NOS) prior to construction and they will be required to submit a report to the NOS, documenting the start date, end date and location of the completed project. The applicant will also be required to coordinate with the USCG to ensure that all appropriate navigational aids will be installed during construction.

k. Shore erosion and accretion

As stated by the applicant, this project would serve to mitigate chronic erosion experienced along the “hotspots” and to maintain ~18-miles of oceanfront and inlet shoreline of Bogue Banks to a 25-year LOP. In conjunction with the existing MCH and AIWW federal projects, this level of protection would help protect properties along the entire shoreline of the 25-mile long island and ensure the continued use of the oceanfront.

With the ebb tide channel relocation, modeling was conducted to analyze any potential impacts to Bear Island (Hammock’s Beach State Park) which contains the western spit of Bogue Inlet. The modeling efforts, along with the numerical, empirical, and historical assessments of the 2005 relocation project, revealed that only minor changes would occur along the inlet shoulder of Bear Island; consequently, no long-term impacts are expected.

l. Recreation

The 50-year BBMBNP would provide a 25-year LOP along 18-miles of oceanfront beach and inlet shoreline. This level of protection is expected to improve and maintain a wide dry beach which would benefit beach recreation in the short- and long-term.

m. Water supply and conservation

The project will require the use of estuarine/marine water column during construction of the project and all water will return to the ocean upon discharge of the dredged material. The project is not located in a water supply watershed or near water supply intakes or any other drinking water supply facilities. The project will not affect the availability of fresh water supplies.

n. Water quality

Beach compatible sand will be used for the construction of the fillet and any subsequent nourishment activities, and the turbidity caused by the placement of sand would be temporary. On August 31, 2018, the NC Division of Water Quality issued a conditioned Water Quality Certification pursuant to Section 401 of the Clean Water Act, finding that the proposed project will not result in a violation of applicable Water Quality Standards given that certain turbidity standards are met. The permit will be conditioned to require the use of clean fill and beach compatible sand. Reference Chapter 5.3.4.5-Water Quality, for further discussion on impacts.

o. Energy needs

Fossil fuels will be used by the machinery during construction of the project and during subsequent nourishment events. Demand for fossil fuels is expected to temporarily increase in the local area as a result of the project. Upon completion of the project, there should be no appreciable change in energy demands in the form of electricity and fossil fuels.

p. Safety

During beach fill construction with each event, all work areas in the vicinity of the discharge pipe and where heavy equipment will be leveling the material would be clearly marked and cordoned off to protect public health and safety. For in-water operations, the applicant will coordinate with the USCG to ensure that all appropriate navigational aids will be installed.

q. Food and fiber production

The authorization of the proposed project will not directly result in any production of food or fiber and will not have a negative effect on the production of food or fiber. The proposed project will not affect any land that is suitable for agricultural and silvicultural production.

r. Mineral needs

The project will require the dredge mining of the ocean and inlet substrate. Sediment within the ODMDS consists of deposited material for several decades from the MCH federal project. The majority of the ODMDS utilized by the BBMBNP is located outside the 3-nm limit and is subject to BOEM's sand leasing agreement. BOEM is currently processing a leasing agreement for the extraction of the material and completion of the agreement is expected in the late summer. The removal of material from the ODMDS is limited to the sediment deposited from the MCH projects and not the original seafloor substrate.

For the inlet area, sediment distribution modeling demonstrates that the longshore lateral transport of material along the western end of Bogue Banks is in an east-to-west direction. Upon completion of the 2005 Relocation Project, it was shown that the in-filling of the old channel occurred within 2 years with shoals accreting and forming in various locations throughout the inlet complex. Model results show that the project is not expected to result in a net loss of sediment.

s. Considerations of property ownership

The work will not permanently affect full and free access to surrounding properties, the shoreline or navigable waters in the area. Use and access of the shoreline in the project area will be temporarily restricted during the construction of the project. The applicant holds easement access to all properties along the shoreline in order to undertake the operations.

The work will not result in any degradation of properties located along the shoreline and will provide beneficial effects to private and publicly owned properties at a 25-year LOP over a 50-year period.

The project will occur in the vicinity of several authorized federal projects. The proposed project is expected to be compatible with the purposes of those federal projects and I have determined that (1) the proposed action will not be injurious to the public interest, and (2) the proposed action will not impair the usefulness of the Federal projects. This approval was issued to the County by letter dated August 13, 2018 for which the County was informed that the applicant will be solely responsible for any remedial action needed to correct any deficiency in the design or construction of the requested alteration.

It is my determination that the authorization of the proposed project would allow reasonable use of the property while sufficiently protecting the rights of surrounding property owners and the general public through the reduction of shoreline erosion on Bogue Banks.

t. Needs and Welfare of the People

The proposed project may improve storm protection and potentially reduce future potential storm damage to the beach and adjacent coastal properties and infrastructure.

11. Territorial sea, activities affecting coastal zones, activities in Marine Sanctuaries.

This project would be located within territorial seas. The project would result in a larger beach area and the mean low water line would shift no more than 750 feet seaward, tapering back to recent shoreline configurations within a fairly short distance. The baseline from which territorial sea is measured is not anticipated to be altered given that the project would stabilize the shoreline in a fashion that is comparable to the average mean high water level measured over the past few decades.

The project is located in a coastal zone and is consistent with the objectives of the Coastal Zone Management Act. NCDCM issued a conditioned Coastal Area Management Act (CAMA) permit for the proposed project on September 4, 2018.

This project will have no effect on Marine Sanctuaries.

12. Other federal, state or local requirements

The issuance of any authorization for this activity does not remove the responsibility of the applicant to obtain any other required federal, state or local authorizations and a Special Condition of the DA permit will reflect this.

13. Findings and Conclusions

I have reviewed the proposed project pursuant to the 404(b) (1) guidelines (40 CFR Part 230). On the basis of my analysis, discussed in greater detail in Section 9, above, I find that Alternative 4 is the least environmentally damaging practicable alternative. Alternative 4 avoids and/or minimizes impacts to waters of the United States to the maximum extent practicable with the inclusion of the attached DA permit special conditions. I have also found that the applicant's proposed work would not cause or contribute to significant degradation of the waters of the United States.

I have reviewed and evaluated the impacts of this application, considering all relevant public interest factors as discussed in Section 10 of this document, the impacts of this application as described in the FEIS, and the comments of federal and non-federal agencies, environmental groups and other members of the public.

I find that the work can be permitted in accordance with regulations published in 33 CFR Parts 320-332. My decision to issue this permit is based on my evaluation of the probable impacts, including cumulative impacts, as described in the FEIS, and anticipated effects on the public interest. Evaluation of the probable impacts that the proposal could have on the public interest included a careful weighing of all relevant factors. The benefits that reasonably could be expected to accrue from the proposal and the economic benefit of the proposal were balanced against reasonably foreseeable potential detriments, including the loss of waters, and impacts to fish, wildlife and aquatic and beach habitat. I have considered the overall impacts to waters, both individually and cumulatively, and find that the benefits outweigh the detrimental impacts.

I have also evaluated the extent and permanence of the beneficial and/or detrimental effects of the proposed work on the public and private uses to which the area is suited. The proposed project would protect properties by stabilizing the shoreline and reducing flooding risks, improve recreational value along the shoreline and reduce the costs of shoreline stabilization over a 50-year period. Concerns have been raised about potential impacts to aquatic and terrestrial habitat, threatened and endangered species, and the length of the permit. Potential detriments of the project are expected to be short term and minimized with the use of several conservation measures and the inclusion of the RPM and T&C from NMFS' and USFWS' BOs. The benefits

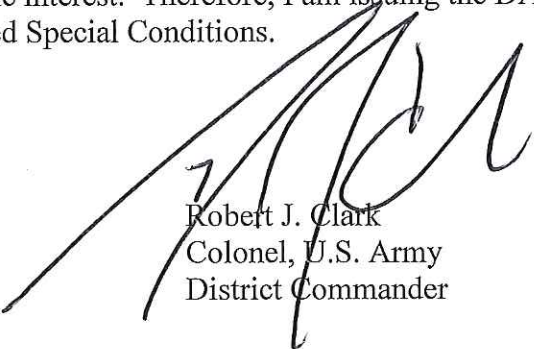
of the proposed project on beach habitat, recreational values, flood damage reduction, land use, and the economy of the project area would be permanent as authorized by the DA permit.

I find that the proposed project (i.e., Alternative 4/BBMBNP) is not contrary to the public interest, and that there are no practicable alternatives that meet the applicant's purpose and need that have less environmental impacts. My decision reflects the national concern for both protection and utilization of important resources, as well as the relative extent of public need for the proposed work. The State of North Carolina has considered the potential water quality impacts of the proposed project and has issued a conditioned Clean Water Act Section 401 Water Quality Certification for the Project. The State has also issued a permit ensuring consistency with the Coastal Zone Management Act.

The project's effects on species protected by the ESA have been evaluated and concluded through consultation pursuant to Section 7, of the ESA. The NMFS and USFWS concluded formal consultation for listed species and critical habitat under their purview, with each issuing their own BO containing certain terms and conditions that will be made part of the DA permit issued for this project.

Consultation under Section 106, National Historic Preservation Act, has been concluded via coordination with the State Division of Cultural Resources. By letter dated April 5, 2018, the SHPO stated that they have no comments on the project and further revealed they are not aware of any historic resources which would be affected by the project. Furthermore, the permit will be conditioned to require operations to cease in the event that any archaeological or historical resources are discovered.

I have considered the comments of federal agencies, as well as state and local agencies, environmental groups, and other interested members of the public. I find that the project complies with the 404(b) (1) guidelines, 33 CFR Parts 320-332, 33 U.S.C 1344 and 33 U.S.C. 403 and is not contrary to the public interest. Therefore, I am issuing the DA permit for Alternative 4 to include the attached Special Conditions.



Robert J. Clark
Colonel, U.S. Army
District Commander

**ACTION ID SAW-2009-00293
PERMIT SPECIAL CONDITIONS**

In accordance with 33 U.S.C. 1341(d), all conditions of the North Carolina Division of Coastal Management CAMA Permit #91-18 dated September 4, 2018, and the North Carolina Division of Water Resources 401 Water Quality Certification # 20180944, dated August 31, 2018, are incorporated by reference as part of the Department of the Army permit, and attached for your convenience. Additionally, all of the stipulations set forth in the Bureau of Ocean Energy Management (BOEM) Lease Agreement, when it becomes finalized, will be incorporated by reference as part of the DA permit.

All of the following Special Conditions run with each project event unless revoked and/or modified during the review time of the individual event. NOTE: Additional conditions will likely be added to individual events to cover specific aspects of those events.

Work Limits

1. All work authorized by this permit must be performed in strict compliance with the attached plans, which are a part of this permit, and specified in the March 4, 2016 BBMBNP. Any modification to these plans must be approved by the U.S. Army Corps of Engineers (USACE) prior to implementation.
2. Prior to initiating any project shoreline protection activities specified in the BBMBNP, a notification request must be submitted to the USACE office for prior approval. This notification must provide a full and complete project event description, including but limited to, justification/need for the project and how it correlates with the targeted 25-year Level of Protection, construction footprints, construction methods and timeframes, borrow source(s), dredging dimensions, beach placement amounts and profiles, and exact reach location(s). Additionally, a cumulative summary of all events completed to the date of submittal under the BBMBNP must be included in the notification to keep a historic record over the 50-year period. The summary must provide a list of all past events that includes the following: Start/end timeframes, borrow source, placement footprints/locations, dredging footprints, and volume amounts.
3. Any work constructed under authorization of this permit shall be restricted to November 16-April 30 of any year during the life of this authorization. No work will occur outside this time period. All activity, including mobilization efforts, is restricted from the beach and inlet shorelines prior to November 16. Upon completion of work, all equipment, including pipelines, must be removed by April 30.
4. Dredge work associated with a planned Bogue Inlet ebb tide channel relocation event must be conducted with a hydraulic cutterhead dredge plant and shall be restricted to the boundary of the designated "safe box". At no time will dredging occur outside this boundary.

Relocation events will be restricted to once every 10 to 15 years, resulting in a maximum of five (5) events over the 50-year authorization period.

5. Dredging activities authorized by this permit shall not in any way interfere with those operations of the USACE Civil Works dredging and navigation projects.
6. If, at any time, the Bogue Banks 50-year Coastal Storm Damage Reduction Federal Project is funded and the permittee chooses to participate in this project, the permittee will notify the USACE Wilmington Regulatory Field Office of their participation in the federal project. Consideration of this participation will be included in future evaluation of events under the BBMBNP.
7. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during the implementation and construction of each project event.
8. Except as authorized by this permit or any USACE approved modification to this permit, no excavating, dredging, mechanized land-clearing, or filling activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of dredged material excavated or material within waters of the United States outside of the permitted fill sites. This prohibition applies to all borrow and fill activities connected with this management plan.
9. Except as authorized by this permit or any USACE approved modification to this permit, no excavation, dredging or fill shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.
10. Prior to the use of borrow site Area Y75-80, additional geotechnical surveys (and other data collection work) must be conducted in, and within 1,500 linear feet of, the boundary of Y75/80 to determine the presence of hardbottom habitat for ensuring that dredging activity and pipeline placement is not within the 1,500-foot buffer. Results of the survey(s) and data collection must be provided to USACE, NC Division of Coastal Management, and National Marine Fisheries Service Habitat Conservation Division (NMFS HCD) for verification. Borrow Site Area Y75-80 shall not be used until approved by the Corps.
11. Dredging depth cuts for offshore and inlet operations will be limited to the following:
 - a) ODMDS: Maximum dredge cut will be 21 feet and an undisturbed 2-foot buffer between the original underlying ocean floor and the dredge cut will apply to all dredging cuts. No cut will exceed a depth of -52 feet NAVD88 (which includes a 2-foot overdredge depth).

b) Area Y: Dredge cuts for Area Y-90/120 range from 10-11 feet below original ocean floor, leaving an undisturbed minimum 2-foot buffer of sandy substrate. No cut will exceed a depth of -62 feet NAVD88 (which includes a 2-foot overdredge depth). Dredge cuts for Area Y75/80 range from 7-13 feet below original ocean floor, leaving an undisturbed minimum 2-foot buffer of sandy substrate. No cut will exceed a depth of -56 feet NAVD88 (which includes a 2-foot overdredge depth).

c) Bogue Inlet: Dredging depth of any realignment channel will not exceed a depth of -18 feet NAVD88 (which includes a 2-foot overdredge depth).

12. For the AIWW Disposal Island borrow sites, the following must be met:

a) Use of the disposal islands may require approval and consent documents from the USACEs, which may impose additional duties or fees. Please contact Todd Horton, USACE, Navigation Branch, (910) 251-4067, to coordinate efforts for the use of the AIWW disposal islands.

b) No wetlands or waters shall be impacted during the use of any identified disposal islands for borrow source, including the construction of the discharge/outfall pipe.

c) Any dike improvement designs must be provided to the USACE for approval prior to conducting the work.

d) Subject to approval by the Navigation Branch, the placement of any discharge pipe shall be extended to deeper water sufficient to avoid shellfish and SAV habitat areas.

e) The discharge pipe must be installed in a manner to prevent a hazard to navigation in accordance with Navigation Branch instruction and U.S. Coast Guard regulations.

13. Prior to the use of any Upland Sand Mine Sources, additional sediment analysis must be completed and submitted to the USACE and NC Division of Coastal Management to verify that the material is beach compatible. The data must include, but not limited to, silt/clay content, grain size, and color. Upland Sand Mine Sources shall not be used until approved by the USACE.

14. All material used for the beach nourishment must be compatible and clean and free of any pollutants except in trace quantities.

Project Maintenance

15. The contractor's name, phone number, and address, including any inspector's contact name and phone number must be provided to the Wilmington District prior to initiating any work.

16. A pre-construction meeting must be held with the USACE prior to conducting the work to ensure that there is a mutual understanding of all terms and conditions contained within this Department of the Army permit. Participants may include, but are not limited to,

representatives from BOEM, United States Fish and Wildlife Service (USFWS), NC Division of Coastal Management and NC Division of Water Quality.

17. All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Resources at (919) 733-5083, Ext. 526 or (800) 662-7956 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.
18. The permittee shall ensure that an inspector is present during all beach disposal activities and immediately report to the USACE in the event any incompatible material is placed on the beach. During operations, material placed on the beach shall be inspected daily to ensure compatibility. On the third day of the week, a visual assessment of the material will be conducted, and the results of that assessment will be submitted to the USACE the same day. On the seventh day of the week, a detailed sediment analysis must be submitted to the USACE to further verify the material's compatibility. This analysis must include, but not limited to, the location of the sample station, shell percentage, silt/clay content, grain size, and color. If during the sampling process non-beach compatible material is or has been placed on the beach, all work shall stop immediately and the USACE notified by the permittee and/or its contractor to determine the appropriate plan of action.
19. Dredging track plots, for both offshore and inlet work, must be provided to our office twice a week to ensure work is conducted within the approved dredging limits. These track plot maps must include the location and depth of the area that has been dredged. Within 2 weeks upon completion of all dredging operations, a complete As-built survey map showing the final volume of material dredged and the dredged footprint must be submitted to the USACE. For inlet channel projects, a Global Positioning Survey (GPS) survey map showing the new channel boundary depicted within the "safe box" limits must also be provided to the USACE.
20. For planned offshore dredging, all pipeline placements must be located in a manner to avoid hardbottom areas. Pipeline locations must be located via GPS and the GPS bearings must be mapped and provided to our office once placement is completed, or no later than one week after pipelines are in place.
21. The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).
22. Monitoring protocols for turbidity shall be implemented so as not to exceed the turbidity standard of 25 NTUs (Nephelometric Turbidity Units) as described in 15A NCAC 02B8.0200. Appropriate sediment and erosion control practices must be used to meet this standard. The monitoring protocols must be provided to the USACE,

Wilmington Regulatory Field Office for review 30 days prior to project commencement.

23. The Permittee shall monitor any in-water dredge pipelines used during the construction activities, in order to check for potential leaks, which may emanate from the pipeline couplings. All dredge and fill activities shall cease if leaks are found. Operations may resume upon appropriate repair of affected couplings, or other equipment.
24. The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.
25. The Permittee shall provide written notification of project completion within one (1) week upon completion of the work authorized by this permit.
26. As-built surveys of the beach must be provided to the USACE as they are being conducted. Final surveys must be submitted within 60 days of the completion of each nourishment event.
27. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the USACE, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal, relocation, or alteration.
28. The authorized project must not interfere with the public's right to free navigation on all navigable waters of the United States. No attempt will be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work for any reason other than safety.
29. The Permittee shall comply with all U.S. Coast Guard regulations for dredging operations. The Permittee shall contact Commander, Fifth Coast Guard District at (757) 398-6220 or CGD5Waterways@uscg.mil at least 30 days prior to construction to request a notice in the Local Notice to Mariners. The Permittee shall notify the Corps when this coordination with the U.S. Coast Guard has commenced.
30. The permittee shall install and maintain, at his expense, any signal lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, on authorized facilities. For further information, the permittee should contact the U.S. Coast Guard Marine Safety Office at (910) 772-2200.

Threatened and Endangered Species

31. The USFWS's August 28, 2017 North Carolina Statewide Programmatic Biological Opinion (SPBO) contains mandatory Reasonable and Prudent Measures and Terms and Conditions that are associated with "incidental take" for beach placement activities. Your authorization under this Corps permit is conditional upon your compliance with all the mandatory reasonable and prudent measures and terms and conditions (see Appendix B) associated with incidental take of the SPBO, which terms and conditions are incorporated by reference in this permit. Failure to comply with these SPBO reasonable and prudent measures and terms and conditions, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The USFWS is the appropriate authority to determine compliance with the reasonable and prudent measures and terms and conditions of its SPBO, and with the Endangered Species Act. The entire SPBO can be accessed at <https://www.fws.gov/raleigh/pdfs/spbo.pdf>.

In the event an incidental take occurs during construction on the beach (or above the Mean Low Water), all work must cease immediately and contact must be made to the USACE, Attn. Mr. Mickey Sugg, Wilmington Regulatory Field Office, at (910) 251-4811 or mickey.t.sugg@usace.army.mil for further coordination with USFWS to determine the appropriate action.

32. The National Marine Fisheries Service Protected Resources Division's (NMFS PRD) October 23, 2018 Biological Opinion (BO) contains mandatory Reasonable and Prudent Measures and Terms and Conditions that are associated with "incidental take" for hopper dredging and relocation trawling activities (see Appendix B). Your authorization under this Corps permit is conditional upon your compliance with all the mandatory reasonable and prudent measures and terms and conditions associated with incidental take of the BO (Section 10, 11, & 12 of the BO), along with the Best Management Practices and Minimization Measures specified in Section 3.1.3 and 3.1.4 of the BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with these BO reasonable and prudent measures and terms and conditions, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your USACE permit. The NMFS PRD is the appropriate authority to determine compliance with the reasonable and prudent measures and terms and conditions of its BO, and with the Endangered Species Act. This BO supersedes any potential use of the 1997 South Atlantic Regional Biological Opinion. The Incidental Take Statement covers the following maximum lethal and non-lethal takes over the 50-year project life:

Incidental Take Statement over the 50-year life of the Project:

Species	Observed Lethal Take	Observed Non-lethal Take
Green sea turtle (NA and SA DPSs combined)	3 (all hopper dredging)	0
Kemp's ridley sea turtle	4 (all hopper dredging)	0
Loggerhead sea turtle (NWA DPS)	24 (23 hopper dredging, 1 relocation trawl)	30 (all relocation trawling)
Atlantic sturgeon (All 5 DPSs combined)	11 (all hopper dredging)	847 (all relocation trawling)

For dredging activities occurring within the ODMDS borrow site beyond the 3-nautical mile limit, BOEM will be the lead agency in all coordination efforts for the implementation of the BO and/or incidental take occurrences. In the case of an incidental take during construction, contact must be made immediately to BOEM, Attn. Ms. Deena Hansen- Office of Environmental Programs at (703) 787-1653, or deena.hansen@boem.gov, for further coordination with NMFS PRD to determine the need for additional action. The USACE should be contacted as well for the purpose of situation awareness. For dredging operations within the 3-nautical mile limit, USACE will be the lead agency in all coordination efforts for the implementation of the BO and/or incidental take occurrence. In the case of an incidental take during construction, contact must be made immediately to the USACE, Attn. Mr. Mickey Sugg, Wilmington Regulatory Field Office, at (910) 251-4811 or mickey.t.sugg@usace.army.mil for further coordination with NMFS PRD to determine the need for additional action. The BOEM should be contacted as well for the purpose of situation awareness. The lead agency and point of contact for the BOEM and the USACE will be further verified during our review of each single event.

33. Dredging operations involving hopper dredge plants must follow the protocols outlined in the Hopper Dredge Conditions disclosed in Appendix C.
34. In order to minimize potential impacts to federally-listed sea turtle species, all in-water lines (rope, chain, and cable, including the lines to secure pipeline buoys) must be stiff, taut, and non-looping. Examples of such lines are heavy metal chains or heavy cables that do not readily loop and tangle. Flexible in-water lines, such as nylon rope or any lines that could loop or tangle, will be enclosed in a plastic or rubber sleeve/tube to add rigidity and prevent the line from looping and tangling. In all instances, no excess line is allowed in the water.
35. All vessels greater than 65 ft will comply with the Right Whale Ship Strike Reduction Rule (50 CFR 224.105; compliance guide can be located in Appendix 1 of the October 23, 2018

BO. Between November 1 and April 30, all dredge and attendant vessels greater than 65 ft will slow to 10 knots (kt) (or minimum safe speed) when a North Atlantic right whale is spotted within 15 nmi of the activity or transportation route within 24 hours, and one of the following conditions is present: poor visibility (e.g., fog, precipitation), Beaufort Sea State >3, or at night. By law, all vessels operators shall maintain a 500-yd buffer between the vessel and any North Atlantic right whale (as required by Federal Regulation 50 CFR 224.103 (c)).

36. The permittee shall implement all necessary precautions and measures so that any activity will not kill, injure, capture, pursue, harass, or otherwise harm any protected federally listed species (such as sea turtles, whales, manatee, shortnose and Atlantic sturgeon, piping plover, and red knot). While accomplishing the authorized work, if the permittee discovers or observes a dead or injured listed endangered or threatened species, the USACE and the BOEM will be immediately notified so that required coordination can be initiated with the USFWS and/or NMFS PRD.
37. For Bogue Inlet channel relocation events, additional measures must be followed:
 - a) Dredging in Bogue Inlet shall not include shoals or other areas above the Mean Low Low Water (MLLW).
 - b) The permittee must identify and map the habitat types within the realignment footprint to verify that shoals or other areas above the MLLW are not within the dredging footprint. This mapping must be submitted to USACE for confirmation prior to dredging.
 - c) Pipeline Placement shall avoid shorebird foraging, resting, and nesting habitat on the inlet shoulders and the west end of Emerald isle, to the maximum extent practicable. A distance of 100 feet or more from nesting shorebirds or shorebirds exhibiting breeding behavior (courtship, territoriality) shall be marked in the field to assist in avoidance of these areas. Marking may include post and string and/or flagging. Any materials used for marking shall be maintained until at least August 31, after which time the materials shall be removed from the beach.
38. In order to further protect the endangered West Indian Manatee, *Trichechus manatus*, the applicant must implement the U.S. Fish and Wildlife Service's Manatee Guidelines, and strictly adhere to all requirements therein. The guidelines can be found at http://www.fws.gov/nc-es/mammal/manatee_guidelines.pdf.
39. The permittee understands and agrees that, even where it is in full compliance with the terms and conditions of this permit and other required authorizations, incidental take of sea turtles or other endangered species by the permittee may require suspension of the permit by the Corps of Engineers. The amount of incidental take that will trigger suspension, and the need for any such suspension, shall be determined at the time in the sole discretion of the USACE and/or BOEM, whoever is the lead agency during the project event. The permittee understands and agrees on behalf of itself, its agents, contractors, and other representatives,

that no claim, legal action in equity or for damages, adjustment, or other entitlement against the USACE shall arise as a result of such suspension or related action.

Cultural Resources

40. If submerged cultural resources are encountered during the operation, work in the area shall cease immediately. For dredging operations within the 3-nautical mile limit, the USACE Wilmington District, Regulatory Division must be immediately notified so that coordination can be initiated with the Underwater Archeology Unit (UAU) of the Department of Cultural Resources. In emergency situations, the permittee should immediately contact Mr. Nathan Henry at (910-458-9042), Fort Fisher, so that a full assessment of the artifacts can be made. For dredging activities occurring beyond the 3-nautical mile limit, within the ODMDS borrow site, BOEM will be the lead agency and must be immediately notified for the coordination efforts to take place.

Enforcement

41. Violations of these permit conditions or violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington Regulatory Field Office, Attn: Mr. Mickey Sugg, Wilmington District U.S. Army Corps of Engineers, 69 Darlington Ave., Wilmington, NC 28403, mickey.t.sugg@usace.army.mil, (910) 251-4811 within 24 hours of the permittee's discovery of the violation.
42. A representative of the USACE, Regulatory Division will periodically and randomly inspect the work for compliance with these conditions. Deviations from the permitted activities and permit conditions may result in cessation of work until the problem is resolved to the satisfaction of the USACE. No claim, legal action in equity or for damages, adjustment, or other entitlement shall be asserted against the United States on account of any such required cessation or related action, by the permittee, its agents, contractors, or other representatives.

Miscellaneous

43. All reports and written notifications required by these permit conditions shall be sent to the USACE c/o the following POC and address: Wilmington Regulatory Field Office, Attn: Mr. Mickey Sugg, Wilmington District U.S. Army Corps of Engineers, 69 Darlington Ave., Wilmington, NC 28403, or mickey.t.sugg@usace.army.mil, (910) 251-4811.
44. All measures and obligations, not previously described above, outlined in Section 6.0 of the February 2018 Final EIS must be fulfilled accordingly.
45. To the extent that any permit attachments and plans conflict with the permit special conditions, the permit special conditions shall prevail.

CESAW-RG-L (Application: SAW-2009-00293/ Carteret County)

SUBJECT: Department of the Army Record of Decision for the Above-Numbered Permit Application

Appendix A

USFWS NORTH CAROLINA STATEWIDE PROGRAMMATIC BIOLOGICAL OPINION (SPBO) REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

CESAW-RG-L (Application: SAW-2009-00293/ Carteret County)

SUBJECT: Department of the Army Record of Decision for the Above-Numbered Permit Application

Appendix B

NMFS PRD BIOLOGICAL OPINION WITH REASONABLE AND PRUDENT MEASURES *AND* TERMS AND CONDITIONS

Appendix C

HOPPER DREDGE CONDITIONS AND FORMS

Endangered Species Protection:

1. Reporting: The Permittee shall ensure all reports, notifications, documentation, and correspondence required by the conditions of this Department of the Army (DA) permit are submitted to the Corps and BOEM follows: Wilmington Regulatory Field Office, Attn: Mr. Mickey Sugg at mickey.t.sugg@usace.army.mil or call at (910) 251-4811 and BOEM, Attn: Ms. Deena Hansen- Office of Environmental Programs at deena.hansen@boem.gov or call at (703) 787-1653. Requests for documents, forms, or information can also be made to the same personnel.

Pre-Dredging Submittals: The Permittee shall submit the completed Hopper Dredge Pre-Dredge Inspection Checklist form (see below) to the Corps, at least 5 days prior to initiating the authorized work. (1) No dredging shall be performed by a hopper dredge without the inclusion of a rigid sea turtle deflector device. The Permittee shall ensure that drawings of the proposed sea turtle deflector device and the Hopper Dredge Deflector Device Checklist form (see below) are complete and all documentation (including drawings showing the proposed device) submitted within 30 days of the anticipated start date to Corps Wilmington Regulatory Field Office, Attn: Mr. Mickey Sugg at mickey.t.sugg@usace.army.mil and BOEM Office of Environmental Programs at deena.hansen@boem.gov. The drawings shall include the approach angle for any and all depths to be dredged during the dredging. (2) The Permittee shall electronically submit detailed drawings showing the proposed draghead grating system(s) and draghead(s), and documentation that supports grate sizing (such as dredge pump manufacturer's recommended maximum particle size dimension(s), etc.). (3) The permittee shall electronically submit an operational plan to achieve protection of sea turtles during the hopper dredging operation.

A copy of the approved drawings and calculations shall be available on the vessel during the dredging. No dredging work shall be allowed to commence until approval of the turtle deflector device has been granted by the Corps and/or BOEM.

2. Pre-Dredging Inspection: A pre-dredging inspection of the hopper dredge shall be performed by the U.S. Army Corps of Engineers, Wilmington District in accordance with the protocol entitled "USACE SEA TURTLE DEFLECTOR CHECKLIST FOR HOPPER DREDGES for USACE and USACE/ARMY-PERMITTED PROJECTS" (see below and located on the ODESS website in Section 7 below). An inspection of the hopper dredge will be scheduled and performed by the Corps after receipt of the notification of commencement (Section 3).

3. Commencement Notification: Within 3 days from the date of initiating the authorized work, the Permittee shall provide to the Corps, the completed Hopper Dredge Startup Inspection Checklist form (see below) with a written notification of the date of commencement of work authorized by this DA permit. An inspection of the hopper dredge will be scheduled and performed by the Corps after receipt of the notification of commencement.

4. Hopper Dredge Equipment: Hopper dredge dragheads shall be equipped with sea turtle deflectors which are rigidly attached. Deflectors shall be solid with no openings in the face. Alternative designs will be considered provided sufficient information is included indicating a particular modification is effective in minimizing potential turtle takes. Corps technical staff will

coordinate with NOAA Fisheries on the effectiveness of this alternate design. No dredging shall be performed by a hopper dredge without an installed sea turtle deflector device approved by the Corps.

a. Deflector Design:

(1) The leading V-shaped portion of the deflector shall have an included angle of less than 90 degrees. Internal reinforcement shall be installed in the deflector to prevent structural failure of the device. The leading edge of the deflector shall be designed to have a plowing effect of at least 6" depth when the drag head is being operated. Appropriate instrumentation or indicator shall be used and kept in proper calibration to insure the critical "approach angle". (Information Only Note: The design "approach angle" or the angle of lower drag head pipe relative to the average sediment plane is very important to the proper operation of a deflector. If the lower drag head pipe angle in actual dredging conditions varies tremendously from the design angle of approach used in the development of the deflector, the 6" plowing effect does not occur. Therefore, every effort should be made to insure this design "approach angle" is maintained with the lower drag pipe.)

(2) If adjustable depth deflectors are installed, they shall be rigidly attached to the drag head using either a hinged aft attachment point or an aft trunnion attachment point in association with an adjustable pin front attachment point or cable front attachment point with a stop set to obtain the 6" plowing effect. This arrangement allows fine-tuning the 6" plowing effect for varying depths. After the deflector is properly adjusted there shall be NO openings between the deflector and the drag head that are more than 4" by 4".

b. In-flow Baskets and overflow screening:

(1) The Permittee shall ensure that baskets or screening are installed over the hopper inflow(s) with no greater than 4" x 4" openings. The method selected shall depend on the construction of the dredge used and shall be approved by the District Engineer prior to commencement of dredging. The screening shall provide 100% screening of the hopper inflow(s). The screens and/or baskets shall remain in place throughout the performance of the work. The turtle deflector device and inflow screens shall be maintained in operational condition for the entire dredging operation.

(2) The Permittee shall install and maintain floodlights suitable for illumination of the baskets or screening to allow the observer to safely monitor the hopper baskets or screening during non-daylight hours or other periods of poor visibility. Safe access shall be provided to the inflow baskets or screens to allow the observer to inspect for turtles, turtle parts, or damage.

(3) The Permittee shall implement 100% overflow screening if inflow screening is not practicable and if prior approval has been granted by the Army Corps of Engineers, Wilmington District.

c. Draghead grating:

(1) Draghead grating may be used to prevent over-sized objects (relative to respective pump and distribution system designs) from reaching and becoming lodged or damaging, the dredge pump and/or slurry distribution system. The Permittee may not use a draghead grating system that would prevent turtle remains from entering the hopper inflow screening. Detailed drawings showing the proposed draghead grating system(s) and draghead(s), and documentation that supports grate sizing (such as dredge pump manufacturer's recommended maximum particle size dimension(s), etc.) shall be submitted. Exceptions for smaller draghead screens will be considered as necessary (e.g., in areas containing ordnance or excessive debris likely to clog or damage the pumps) with supporting justifications. No dredging shall begin until the District has approved all grating and screening.

5. Hopper Dredge Operation:

(a) The Permittee shall operate the hopper dredge to minimize the possibility of taking sea turtles and to comply with the requirements stated in the Incidental Take Statement provided by the NMFS in their issued October 23, 2018 BO.

(b) The turtle deflector device and inflow screens shall be maintained in operational condition for the entire dredging operation.

(c) When initiating dredging, suction through the drag heads shall be allowed just long enough to prime the pumps, and then the drag heads must be placed firmly on the bottom. When lifting the drag heads from the bottom, suction through the drag heads shall be allowed just long enough to clear the lines, and then must cease. Pumping water through the drag heads shall cease while maneuvering or during travel to/from the disposal area. If the required dredging section includes compacted fine sands or stiff clays, a properly configured arrangement of teeth may enhance dredge efficiency, which reduces total dredging hours, and "turtle takes." The operation of a drag head with teeth must be monitored for each dredged section to insure that excessive material is not forced into the suction line. When excess high-density material enters the suction line, suction velocities drop to extremely low levels causing conditions for plugging of the suction pipe. Dredge operators should configure and operate their equipment to eliminate all low-level suction velocities. Pipe plugging in the past was easily corrected, when low suction velocities occurred, by raising the drag head off the bottom until the suction velocities increased to an appropriate level. Pipe plugging cannot be corrected by raising the drag head off the bottom. Arrangements of teeth and/or the reconfiguration of teeth should be made during the dredging process to optimize the suction velocities.

(d) The Permittee shall not raise the drag head off the bottom to increase suction. The primary adjustment for providing additional mixing water to the suction line should be through water ports. To insure that suction velocities do not drop below appropriate levels, the Dredging Inspector for the Permittee shall monitor production meters throughout the job and adjust primarily the number and opening sizes of water ports. Water port openings on top of the drag head or on raised standpipes above the drag head shall be screened before they are utilized on the dredging project. If a dredge section includes sandy shoals on one end of tract line and mud

sediments on the other end of the tract line, the equipment shall be adjusted to eliminate drag head pick-ups to clear the suction line.

(e) The drag head shall be buried a minimum of 6 inches in the sediment at all times. Although the over depth prism is not the required dredging prism, the Permittee shall achieve the required prism by removing the material from the allowable over depth prism.

(f) During turning operations the pumps must either be shut off or reduced in speed to the point where no suction velocity or vacuum exists.

6. The National Dredging Quality Management (DQM): The Permittee shall implement the DQM system during dredging and dredged material disposal. The Permittee's DQM system must have been certified by the DQM Support Center within one calendar year prior to the initiation of the dredging/disposal. Questions regarding certification should be addressed to the DQM Support Center at 877-840-8024 or email at DQM-Support@usace.army.mil. Additional information about the DQM System can be found at <http://dqm.usace.army.mil/>. The Permittee is responsible for ensuring that the DQM system is operational throughout the dredging and disposal project and that project data are submitted in accordance with the specifications provided at the aforementioned website. The data collected by the DQM system shall, upon request, be made available to the Regulatory Division of the U.S. Army Corps of Engineers, Wilmington District.

7. Operations and Dredging Endangered Species System (ODESS):

7.1 Monitoring Endangered Species

In order to monitor dredging impacts on threatened and endangered aquatic species, the dredge shall be equipped with a dedicated tablet computer running ODESS software to track and document the presence of sea turtle, sturgeon, and marine mammal species during dredging operations. The use of ODESS will facilitate enhanced monitoring and data collection, enable faster transmittal of information, and meet threatened and endangered species reporting requirements to the NMFS PRD.

The ODESS system, which consists of a tablet computer with an Internet connection, shall be a stand-alone system, exclusive to other systems, and shall have USACE ODESS data collection and reporting software, referred to as the ODESS Field Collector (FC) tool, installed by USACE ODESS support personnel. In the event hardware or software problems prevent the storage or transmission of the collected data, paper copies of the latest ODESS forms and information shall be maintained and submitted to ODESS Support and the USACE Inspector.

7.2 ESO Qualifications and Training

Prior to the initiation of the project, Endangered Species Observers (ESOs) shall be familiar with the operation of the ODESS FC tool and proficient in its use so as to be able to prepare and transmit the results of their observations. ODESS system webinar training can be requested by contacting ODESS Support at ODESS@usace.army.mil or 1-877-840-8024.

Depending on the target audience (ESO, dredging Contractor, USACE District personnel, or other Federal agencies), ODESS training could, in addition to the webinar training, consist of demonstrating the steps involved in setting up the FC tool on the dredge, loading Observer-collected data and attachments into the FC tool, submitting these data and attachments to the ODESS database, and/or navigating around the ODESS public website to view and pull down data and/or decision-making information for later analysis.

7.3 ESO Data Collection and Reporting

ESOs shall record the results of the threatened and endangered species monitoring (described in paragraph "REQUIRED CONDITIONS TO MINIMIZE IMPACTS TO ENDANGERED SPECIES" and paragraph "SEA TURTLES AND STURGEON" of this specification) in the ODESS system by filling in the appropriate electronic forms on the ODESS FC tool and transmitting the data to the ODESS database. If there is an issue with recording data straight to the FC tool due the logistical nature of how the ESO is collecting this data, paper copies of these forms or can be downloaded from the ODESS public website (<http://dqm.usace.army.mil/odess/#/download>) and later entered into the FC tool when the ESO has the best opportunity.

7.4 Start of the Project

Prior to the start of dredging, ESOs shall verify that the ODESS FC tool is installed and operational on a dredge's dedicated tablet computer and that a viable Internet connection is available. In addition, before a project is initiated, on the ODESS FC tool homepage ESOs shall retrieve (or "pull down") project-specific information from the ODESS database and perform a one-time setup of the dredging project by establishing the dredge name and time zone.

7.5 During the Project

The following forms shall be used in the FC tool and submitted to the ODESS database at the indicated reporting frequency.

a) Load Data Form

Endangered Species Observers (ESOs) shall complete the Dredge Load Data Form (see below), including a description of screen contents and sea conditions, based on their observations. This form shall be completed and transmitted to the ODESS database for each load. At the end of each Observer shift, or when an Internet signal is available (not to exceed 24 hours from the start of the shift), the ESO shall submit all of his/her Dredge Load Data Forms. If this is not possible due to hardware or software problems, the ESO shall revert to email submission of the forms to ODESS@usace.army.mil.

b) Sea Turtle Incidental Data Form

If a sea turtle or its remains are identified during a load inspection, after the appropriate parties are notified, a Sea Turtle Incidental Data Form (see below) shall be completed and submitted to the ODESS database as soon as possible (not to exceed 6 hours after the incident). Any applicable documentation (scanned copies of the paper Observer load and incident forms, species photos, etc.) shall be included as electronic attachments (.JPG or .PDF) and submitted using the FC tool.

c) Sturgeon Incidental Data Form

If a sturgeon or sturgeon parts are identified during a load, after the appropriate parties are notified, a Sturgeon Incidental Data Form (see below) shall be completed and submitted to the ODESS database as soon as possible (not to exceed 6 hours after the incident). Any applicable documentation (scanned copies of the paper Observer load and incident forms, species photos, etc.) shall be included as electronic attachments (.JPG or .PDF) and submitted using the FC tool.

d) Marine Mammal Observation Data Form

If a large whale is observed, both the Dredge Load and the Marine Mammal Observation Data Forms (see below) shall be completed and submitted (not to exceed 6 hours after the observation) to ODESS Support at ODESS@usace.army.mil consistent with the endangered species conditions of this permit.

ESOs are required to use the FC tool to send all incident attachments and any necessary documentation (i.e., pictures, etc). Do not send attachments via personal email unless the FC tool is unavailable. Also, the paper forms, if needed, should be used as either a "scratch pad" for data collection notes or used any time the FC tool becomes unavailable. The FC tool is the primary means of observer data collection and reporting, not the paper forms. It is not required to scan, attach and submit a copy of the load and incident paper forms as part of the electronic incident record unless it is needed to support the electronic incident record (e.g., species diagram markups).

7.6 End of the Project

At the completion of project, the dredging Contractor shall coordinate with the designated USACE point of contact (POC) to determine whether electronic or paper copies of all applicable Observer paper forms will be submitted for the project. Information previously entered on the Post Hopper Dredging Checklist will be available on the ODESS public website (<http://dqm.usace.army.mil/odess>) for the dredging project.

7.7 Hardware Requirements

The dredge shall be equipped and the Contractor is responsible for an ODESS hardware system consisting of a tablet computer, wireless keyboard, wireless mouse and data modem (or equivalent onboard internet connection) along with a proper tote bag and setup location for the afore mentioned hardware components. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor shall be responsible for repairing it within 48 hours of determination of the condition. The Contractor shall also keep ODESS personnel updated on the status of the onboard ODESS system and the progress of any repairs.

7.8 Computer

The Contractor shall provide a dedicated onboard tablet computer for use by the ESOs and shall have ODESS software installed on it prior to project initiation. This computer shall be located and oriented to allow data entry and data viewing. It must meet or exceed the following specifications:

TABLET HARDWARE COMPONENT	SPECIFICATION
CPU	Intel or AMD processor with a (non-overclocked) clock speed of at least 2.4 gigahertz (GHz)
Hard Disk	128 gigabytes (GB); solid state internal storage
RAM	4 gigabytes (GB)

TABLET HARDWARE COMPONENT	SPECIFICATION
Network Adapter	Internal wired or wireless network hardware to match internet connection
Video Adapter	Support for 1024x768 resolution at 16-bit color depth
Display	\geq 10.8 in.
Integrated Camera	2MP HD webcam (front); 8MP (back)
Ports	1 free USB port

7.9 Internet Access

The Contractor shall maintain an Internet connection capable of transmitting data to the ODESS database. The telemetry system shall always be available and have connectivity in the contract area. If connectivity is lost, unsent data shall be stored locally within the FC tool and transmitted upon restoration of connectivity. The Contractor shall acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the ODESS database. The hardware and software must be configured to allow remote access to the computer by USACE ODESS personnel. Coordination between the dredging company's IT and ODESS Support may be required in order to configure remote access through any security, firewall, router,

and telemetry systems. Telemetry systems must be capable of meeting these minimum reporting requirements in all operating conditions.

7.10 Software Requirements

ODESS personnel shall be responsible for installing and testing all ODESS software tools on the dedicated onboard ODESS tablet computer. No other software which conflicts with the ODESS function of recording and transmitting data shall be installed on the tablet computer. The Contractor shall be responsible for installing and/or maintaining any necessary manufacturer-provided software for the installed hardware. If any software problem occurs, the Contractor shall contact ODESS Support at ODESS@usace.army.mil or 1-877-840-8024.

The ODESS tablet computer shall have the following minimum software installed in support of the ODESS system.

SOFTWARE COMPONENT	SPECIFICATION
Operating System	Windows 10, Contractor-installed
Browser*	Chrome, Internet Explorer, Contractor-installed
ODESS Software	Field Collector (FC) tool, USACE ODESS Support-installed
Remote Access Software	Team Viewer, USACE ODESS Support-installed

*Latest version recommended, Chrome is preferred.

8. Relocation Trawling:

a. Reporting: A daily log (see below, ODESS Relocation Trawl Daily Report) shall be kept for each non-capture trawling operations. The non-capture trawl log shall be submitted to the Corps Wilmington Regulatory Field Office, Attn: Mr. Mickey Sugg at mickey.t.sugg@usace.army.mil and BOEM Office of Environmental Programs, Attn: Ms. Deena Hansen at deena.hansen@boem.gov at the completion of the project. Data to be included with this log daily will include:

- (1) GIS coordinate of trawl locations at the start and end of each sweep
- (2) Times recorded for each trawl sweep duration;
- (3) Description of dredge proximity during each sweep;

(4) General notes as appropriate (e.g. condition of equipment at the end of each sweep, snags occurring during each sweep, incidental debris, etc.).

(5) Water Quality and Physical Measurements: Water temperature measurements shall be taken at the water surface each day using a laboratory thermometer. Weather conditions shall be recorded from visual observations and instruments on the trawler. Weather conditions, air temperature, wind velocity and direction, sea state-wave height, and precipitation shall be recorded on the ODESS Trawling Report (see below). High and low tides shall be recorded.

b) Trawling Conditions: Reference the October 2018 BO Terms and Conditions #5. All trawling shall adhere to the listed conditions (Trawl Time; Handling During Trawling; Holding Condition; Measurements, Sampling, and Tagging; Take and Release Time During Trawling; Injuries and Incidental Take Quota) under this term and condition.

9. Endangered Species Observers: Prior to the initiation of the project, Endangered Species Observers (ESOs) shall be familiar with the operation of the ODESS FC tool and proficient in its use so as to be able to prepare and transmit the results of their observations. ODESS system webinar training can be requested by contacting ODESS Support at ODESS@usace.army.mil or 1-877-840-8024.

During dredging operations, observers approved by the National Oceanic and Atmospheric Administration – Fisheries (NOAA-Fisheries) for sea turtles, sturgeon (shortnose and Atlantic) and whales shall be aboard to monitor for the presence of the species. Observer coverage shall be 100 percent (24hr/day) and shall be conducted year round. During transit to and from the disposal area, the observer shall monitor from the bridge during daylight hours for the presence of endangered species, especially the Northern right whale, during the period December through March. During dredging operations, while dragheads are submerged, the observer shall continuously monitor the inflow and/or overflow screening for turtles and/or turtle parts and sturgeon (Shortnose and Atlantic) and/or sturgeon (shortnose and Atlantic) parts. Upon completion of each load cycle, dragheads should be monitored as the draghead is lifted from the sea surface and is placed on the saddle in order to ensure that sea turtles that may be impinged within draghead are not lost and un-accounted for. Observers shall physically inspect dragheads and inflow and overflow screening/boxes for threatened and endangered species take. Other abiotic and biotic debris found in the screens during their examination for sea turtle or sturgeon (shortnose and Atlantic) parts shall be recorded and then disposed of so as not to impede the functioning of the screens during the next load cycle.

a. Monitoring Reports: The results of the monitoring shall be recorded on the appropriate observation sheets. There is a sheet for each load, a daily summary sheet, and a weekly summary sheet. In addition, there will be a post dredging summary sheet. Observation sheets (see below, ODESS Marine Mammal Observation) shall be completed regardless of whether any takes of sturgeon (Shortnose or Atlantic), whales, or sea turtles occur. In the event of any sea turtle or sturgeon (Atlantic or Shortnose) take by the dredge, appropriate incident reporting forms (see below, ODESS Turtle Incident and ODESS Sturgeon Incident) shall be completed.

b. The Permittee shall provide a digital camera, with an image resolution capability of at least 300 dpi, in order to photographically report all incidental takes, without regard to species, during dredging operations. Immediately following the incidental take of any threatened or endangered species, images shall be provided, via email, CD or DVD to the USACE and BOEM in a .JPG or .TIF format and shall accompany incidental take forms. The nature of findings shall be fully described in the incidental take forms including references to photographs.

10. Incidental Take: In the event an incidental sea turtle, whale, manatee, sturgeon (Shortnose or Atlantic) take occurs by a dredge, the Permittee shall immediately notify and report to the USACE and BOEM upon discovery of an incidental take of a manatee, sea turtle, sturgeon, or whale. A copy of the ODESS incidental take report (see below, ODESS Turtle Incident and ODESS Sturgeon Incident), along with photographic documentation, shall be provided within 24 hours of the incident. If a sea turtle or sturgeon is taken by the dredge (live or dead), the Permittee shall email (within 6 hours of the take) a PDF version of the incidental take form to the NOAA-Fisheries Southeast Region at takereport.nmfsser@noaa.gov, the USACE Wilmington Regulatory Field Office, Attn: Mr. Mickey Sugg at mickey.t.sugg@usace.army.mil, and BOEM, Attn. Ms. Deena Hansen- Office of Environmental Programs at deena.hansen@boem.gov.