US Army Corps
of Engineers
Philadelphia District

GREAT EGG HARBOR INLET TO TOWNSENDS INLET STORM DAMAGE REDUCTION PROJECT

CAPE MAY COUNTY, NJ

DRAFT ENVIRONMENTAL ASSESSMENT (EA)

Draft

SEPTEMBER 2013

PREPARED BY:

U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT

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GREAT EGG HARBOR INLET TO TOWNSENDS INLET
STORM DAMAGE REDUCTION PROJECT
CAPE MAY COUNTY, NJ
FINDING OF NO SIGNIFICANT IMPACT (FONSI)

In 2001, the United States Army Corps of Engineers, Philadelphia District, evaluated the environmental impacts associated with the construction of the Great Egg Harbor Inlet to Townsends Inlet Storm Damage Reduction Project, and prepared a Final Environmental Impact Statement (FEIS), which was filed with the Environmental Protection Agency in 2002. A Record of Decision (ROD) was signed on October 18, 2011. The selected plan involves the placement of beachfill sand, which would be obtained from offshore sources to construct a berm and a dune for the purpose of storm damage reduction for the communities on Peck Beach (southern end of Ocean City) and Ludlam Island (Sea Isle City and Upper Township – Strathmere). Maintenance of the berm and dune would be accomplished by periodic sand nourishment for both locations. Subsequent to 2001, the initial construction quantities and periodic nourishment quantities were reduced for both project areas from the plan proposed in the 2001 FEIS. For the southern end of Ocean City, the plan extends from 34th Street to 59th Street for a total length of 2.6 miles. The current initial sand quantity required is estimated at 1,577,000 cubic yards, which is a reduction from the original plan quantity of 1,603,000 cubic yards. Periodic nourishment was reduced from 403,000 cubic yards to 302,000 cubic yards, and is scheduled to occur every 3 years. The periodic nourishment for the southern end of Ocean City would be synchronized with the existing Federal beachfill project at Ocean City (Great Egg Harbor Inlet to 34th Street). The design template has a dune crest with a top elevation of +12.8 ft NAVD88, a top width of 25 ft. and side slopes of 1V:5H., while the berm extends from the seaward toe of the dune for a distance of 100 ft. at an elevation of +7.0 ft. NAVD88 before sloping down at 1V:25H to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) is approximately 218 ft. The construction template includes an additional berm width of about 50 ft. to include advance nourishment (sacrificial portion of the beachfill). This will result in an overall beach width of approximately 285 ft. to MHW at the completion of initial construction and each periodic nourishment.

For Ludlam Island, the plan extends from about 125 feet north of Seaview Avenue in Strathmere to Pleasure Ave. (just beyond 93rd Street) in Sea Isle City for a total length of 6.5 miles. In addition, there is a taper of 734 feet into Corson's Inlet State Park (Strathmere Natural Area) and a taper of 66 feet into the terminal groin south of 93rd Street. The total length of beachfill, including tapers, is 6.7 miles. The plan also includes the extension of two stormwater outfall pipes at both 84th and 88th Street in Sea Isle City by 150 feet. The current initial sand quantity required for Ludlam Island is estimated at 2,590,000 cubic

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yards, which is a reduction from the original plan quantity of 5,146,000 cubic yards. Periodic nourishment was reduced from 1,820,000 cubic yards to 734,000 cubic yards, and is scheduled to occur every 5 years. The design template will have a dune crest with a top elevation of +14.8 ft. NAVD88, a top width of 25 ft. and side slopes of 1V:5H. The berm width will extend from the seaward toe for a distance of 50 ft. at an elevation of +6.0 ft. NAVD88 before sloping down (varying from 1V:30H to 1V:50H) to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width of the design template from the seaward toe of the dune to Mean High Water (MHW) varies depending upon location from 190 to 285 feet. The construction template includes an additional berm width of about 50 ft. to include advance nourishment (sacrificial portion of the beachfill). This will result in an overall beach width of approximately 240 ft. to 335 ft. to MHW at the completion of initial construction and for each periodic nourishment.

For initial construction in both segments, material would be taken from the sand borrow area identified as “L3”. Periodic nourishment sand would be obtained from the sand borrow areas: L3, C1 (Corson Inlet), and L1. Borrow Area M8 and a portion of L3 are located entirely within Federal waters, and would be used for periodic nourishment upon approval from the Bureau of Ocean Energy Management.

In compliance with the National Environmental Policy Act of 1969, as amended, and Council on Environmental Quality (CEQ) regulations, the Philadelphia District has prepared an Environmental Assessment (EA) to evaluate new information and proposed modified actions subsequent to the FEIS. The Draft EA for the project was forwarded to the U.S. Environmental Protection Agency Region II, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the New Jersey State Historic Preservation Office, the New Jersey Department of Environmental Protection (NJDEP), and all other known interested parties for comment.

The EA concludes that the proposed storm damage reduction project, if implemented, would not likely jeopardize the continued existence of any species or the critical habitat of any fish, wildlife or plant, which is designated as endangered or threatened pursuant to the Endangered Species Act of 1973 as amended by P.L. 96-159.

The EA also concludes that the project can be conducted in a manner, which should not violate New Jersey's Surface Water Quality Standards. Pursuant to Section 401 of the Clean Water Act, a 401 Water Quality Certificate was received from the NJDEP in 2006, and was modified in 2009. Based on the information developed during preparation of the Environmental Assessment, and the application of appropriate measures to minimize project impacts, it was determined in accordance with Section 307(C) of the Coastal Zone Management Act of 1972 that the plan complies with and can be conducted in a manner that is

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consistent with the approved Coastal Zone Management Program of New Jersey. A Federal consistency determination for this project was provided by NJDEP in 2006, and was modified in 2009.

There are no known properties listed on, or eligible for listing on, the National Register of Historic Places that would be affected by the proposed activity. The proposed plan has been designed to avoid archaeologically sensitive areas, and is expected to have No Adverse Effect on historic properties potentially eligible for or listed on the National Register of Historic Places.

The proposed Great Egg Harbor Inlet to Townsends Inlet Storm Damage Reduction Project will not significantly affect the quality of the human environment; therefore a Supplemental Environmental Impact Statement is not required.

_____ _____

Date

John C. Becking, P.E.
Lieutenant Colonel, Corps of Engineers
District Engineer

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1.0 INTRODUCTION

This document is being issued pursuant to 33 CFR 230.10(a) and is intended to present and evaluate new information for the Great Egg Harbor Inlet to Townsends Inlet Storm Damage Reduction Project located along the Atlantic Coast of New Jersey (Figure 1). The information in this document updates the previously published National Environmental Policy Act (NEPA) document, which is the Final Feasibility Report and Integrated Environmental Impact Statement (EIS) (dated September 2001). A Record of Decision (ROD) was signed on October 18, 2011. To minimize duplication, items involving new pertinent information and changes in the plan as previously proposed are addressed in this document. Items covered previously in the Final Feasibility Report and Integrated EIS are incorporated by reference and are referenced herein as USACE (2001), unless otherwise specified. USACE (2001) can be accessed by the following links:

- http://www.nap.usace.army.mil/Portals/39/docs/Civil/GtEgg/GtEggFinalRpt_Sep2001.pdf
- http://www.nap.usace.army.mil/Portals/39/docs/Civil/GtEgg/Appendix%20A.pdf

2.0 PURPOSE AND NEED

The purpose of this project is to provide storm damage reduction for the communities of Ocean City, Upper Township (Strathmere and Whale Beach), and Sea Isle City located in Cape May County, NJ (Figure 1) based on the vulnerability of these communities to significant economic damages to structures and properties due to storms. Severe storms in recent years have caused a reduction in the overall beach height and width along the study area. This exposes these communities to catastrophic damage from ocean flooding and wave attack in the absence of a long-term commitment of protection. Subsequent to USACE (2001), the project area has experienced several significant storm events most notably the Nor'Ida Storm of 2009, Hurricane Irene in 2011, and the devastating Hurricane Sandy in October 2012, which has caused severe economic damages in the region. Based on the vulnerability of this area, a Federal storm damage reduction project is needed that will provide a long-term commitment to these communities. In response to Hurricane Sandy, the project schedule for implementation is being expedited in accordance with P.L. 113-2: Disaster Relief Appropriations Act (FY 2013) for authorized Federal projects in areas affected by Hurricane Sandy that have not been constructed.

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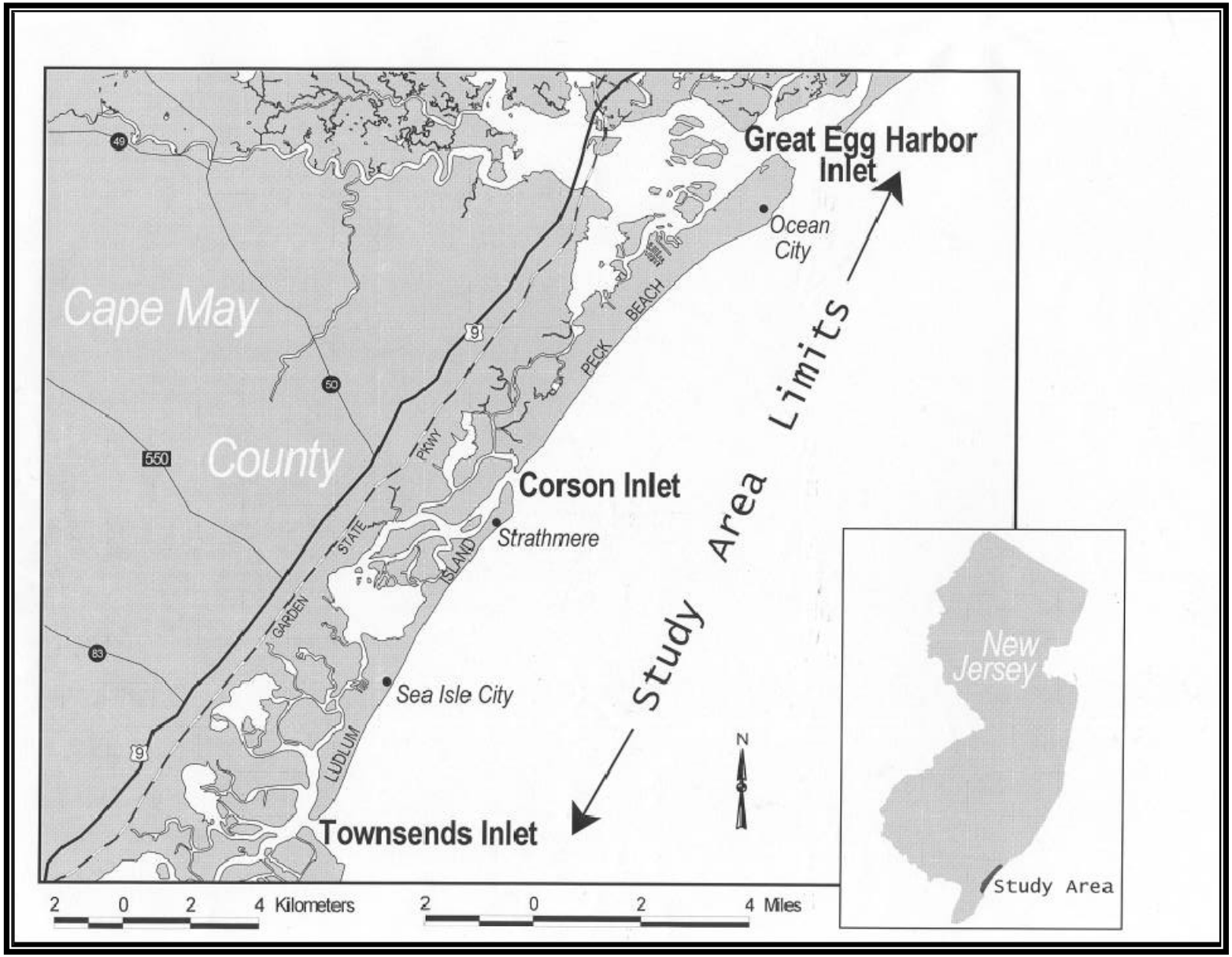

Figure 1. Project Area and Vicinity

3.0 ALTERNATIVES CONSIDERED

In USACE (2001), a number of structural and non-structural storm damage reduction alternatives were identified and evaluated individually and in combination on the basis of their suitability, applicability and merit in meeting the planning objectives, planning constraints, economic criteria, environmental criteria and social criteria for the study.

The final screening of alternatives concluded that only berm and dune restoration utilizing sandy material dredged from a nearby offshore source should be considered further for both areas. The NED plan identified for both Ocean City and Ludlam Island is berm and dune restoration utilizing beachfill. Detailed descriptions of these plans are provided in Section 4.1 and 4.2.

These plans were chosen because they provide the maximum net benefits over costs based on storm damage reduction. USACE (2001) provided a comparative environmental impact analysis of the various alternatives considered. Additionally, a number of sand sources were screened based on their suitability and environmental impacts. The sand sources proposed in USACE (2001): M8, C1, L1 and L3 were determined to be suitable based on their material grain sizes and lower impacts to fisheries resources.

In 2013, the selected plan was reanalyzed for storm damage reduction benefits post Hurricane Sandy. This analysis is documented in a Limited Reevalutation Report (USACE, 2013), which reaffirms that the proposed project is economically justified, and in the Federal interest with a benefit to cost ratio of 1.7.

4.0 EXISTING CONDITIONS, NO ACTION AND PROPOSED PROJECT

4.1 Proposed Plan from USACE (2001)

USACE (2001) evaluated various alternative plans of improvement formulated for hurricane and storm damage reduction. To effectively address the problem, separate plans were formulated for the southern end of Ocean City and Ludlam Island (Sea Isle City and Strathmere) (Figure 2). Both selected plans were in the form of berm and dune restoration utilizing beachfill to reduce storm damages for these communities. Details of the authorized plan from USACE (2001) are provided below; however the plan was subsequently modified. The proposed modifications to the plan involve reductions in quantities and sand borrow area usage changes, which are provided in Section 4.2.

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Although the project evaluated in USACE (2001) included the area from "Great Egg Harbor Inlet to Townsends Inlet", the Ocean City portion of the plan only included the southern end. An existing Federal beachfill project ("Great Egg Harbor Inlet and Peck Beach") occurs at the northern end of Ocean City from the Great Egg Harbor Inlet (Seaview Road) South to 34th St (Figure 3). This project was initially constructed in 1990, and receives periodic nourishment every four years. No modifications to the Great Egg Harbor Inlet and Peck Beach project were recommended in USACE (2001).

In USACE (2001), the selected plan for the south end of Ocean City consists of a berm and dune utilizing sand obtained from an offshore borrow source. The design template (Figures 2 and 5), has a dune crest with a top elevation of +3.9 meters (+12.8 ft) NAVD88, a top width of 7.6 meters (25 ft) and side slopes of 1V:5H., while the berm extends from the seaward toe of the dune for a distance of 30.5 m (100 ft.) at an elevation of +2.1 m (+7.0 ft) NAVD88 before sloping down at 1V:25H to elevation -0.38 m (-1.25 ft.) NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) is approximately 66 m (218 ft). The construction template includes an additional berm width of about 15 m (50 ft.) to include advance nourishment (sacrificial portion of the beachfill). This will result in an overall beach width of approximately 87 m (285 ft.) to MHW at the completion of initial construction and with each periodic nourishment.

The selected plan for southern end of Ocean City ties into the existing Federal beachfill project ("Great Egg Harbor Inlet and Peck Beach") at 34th St., and extends from 34th Street to 59th Street for a total length of 2.6 miles (Figures 2, 3, and 4). Initial sand quantity (from USACE, 2001) was 1,218,000 cu meters (1,603,000 cu yds) which included a design fill quantity of 912,000 cu meters (1,192,000 cu yds) plus advance nourishment of 306,000 cu meters (403,000 cu yds). Periodic nourishment (from USACE, 2001) of 306,000 cu meters (403,000 cu yds) is scheduled to occur every 3 years synchronized with the existing Federal beachfill project at Ocean City (Great Egg Harbor Inlet to 34th Street). Material for initial construction and periodic nourishment was proposed in 2001 to have been taken from the borrow source identified as "M8" (Figure 8).

The selected plan for Ludlam Island (Figures 2 and 6) also consists of a berm and dune utilizing sand obtained from offshore sand borrow sources. The design template (Figures 2 and 7) will have a dune crest with a top elevation of +4.5 meters (+14.8 ft) NAVD88, a top width of 7.6 meters (25 ft) and side slopes of 1V:5H. The berm width will extend from the seaward toe for a distance of 15 meters (50 ft) at an elevation of 1.8 meters (6.0 ft) NAVD88 before sloping down (varying from 1V:30H to 1V:50H) to elevation –0.38 meters (-1.25 ft) NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width of the design template from the seaward toe of

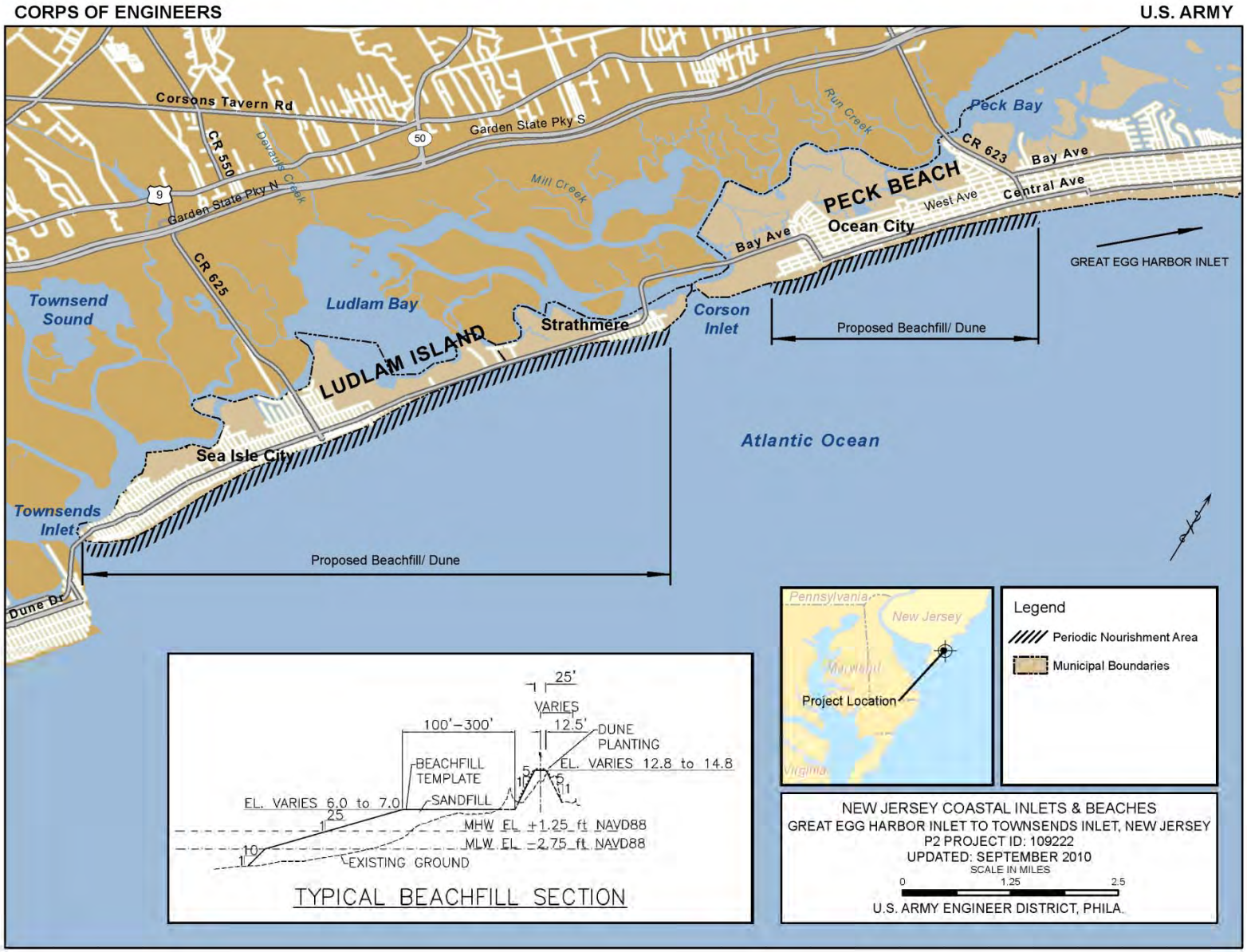


Figure 2. Proposed Great Egg Harbor Inlet to Townsends Inlet Project (Southern Ocean City and Ludlam Island)

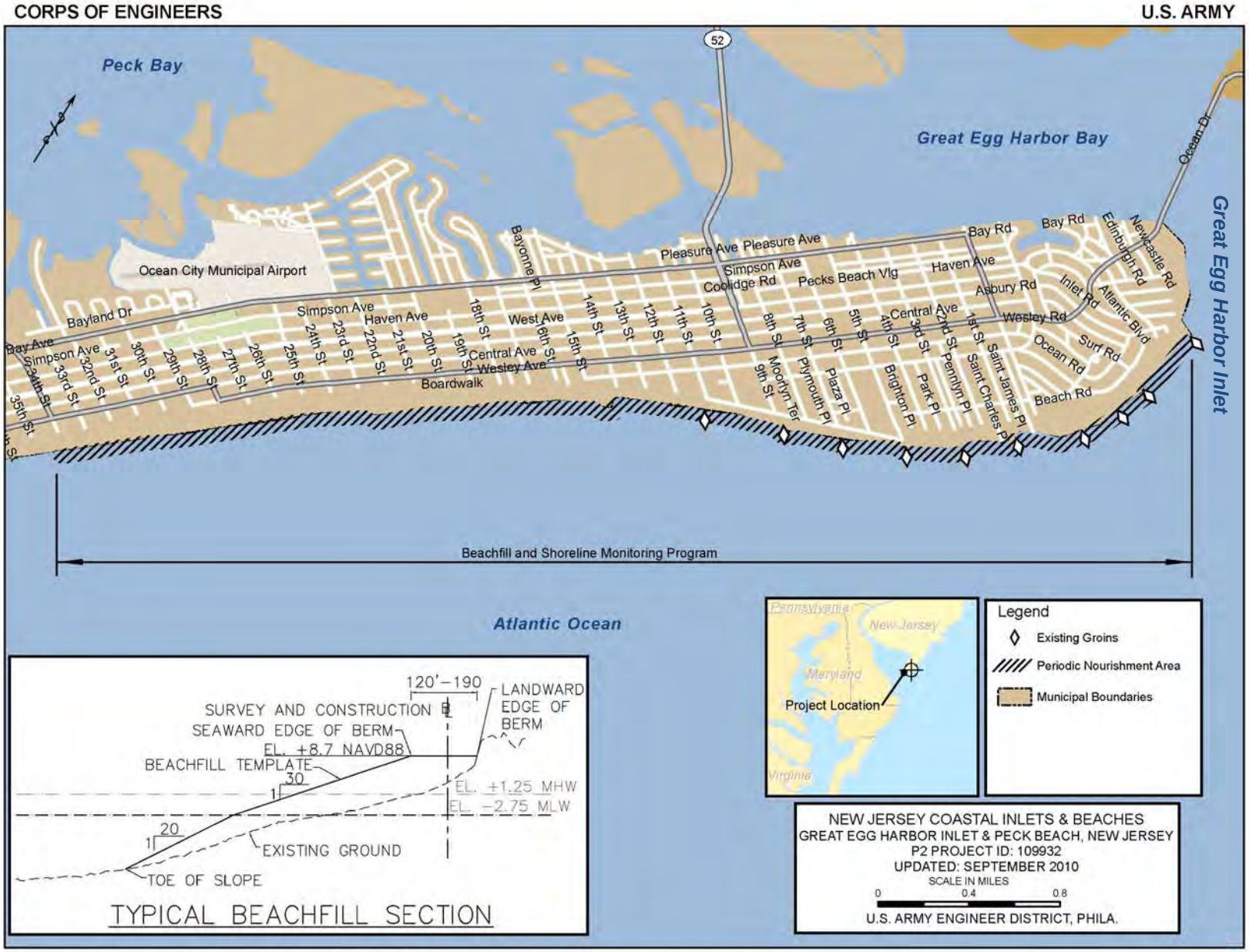


Figure 3. Existing Federal Project: Great Egg Harbor Inlet and Peck Beach for Northern Ocean City

the dune to Mean High Water (MHW) varies depending upon location from 58 to 87 meters (190 to 285 feet). The construction template includes an additional berm width of about 15 m (50 ft.) to include advance nourishment (sacrificial portion of the beachfill). This will result in an overall beach width of approximately 73 m to 102 m (240 ft. to 335 ft.) to MHW at the completion of initial construction and with each periodic nourishment.

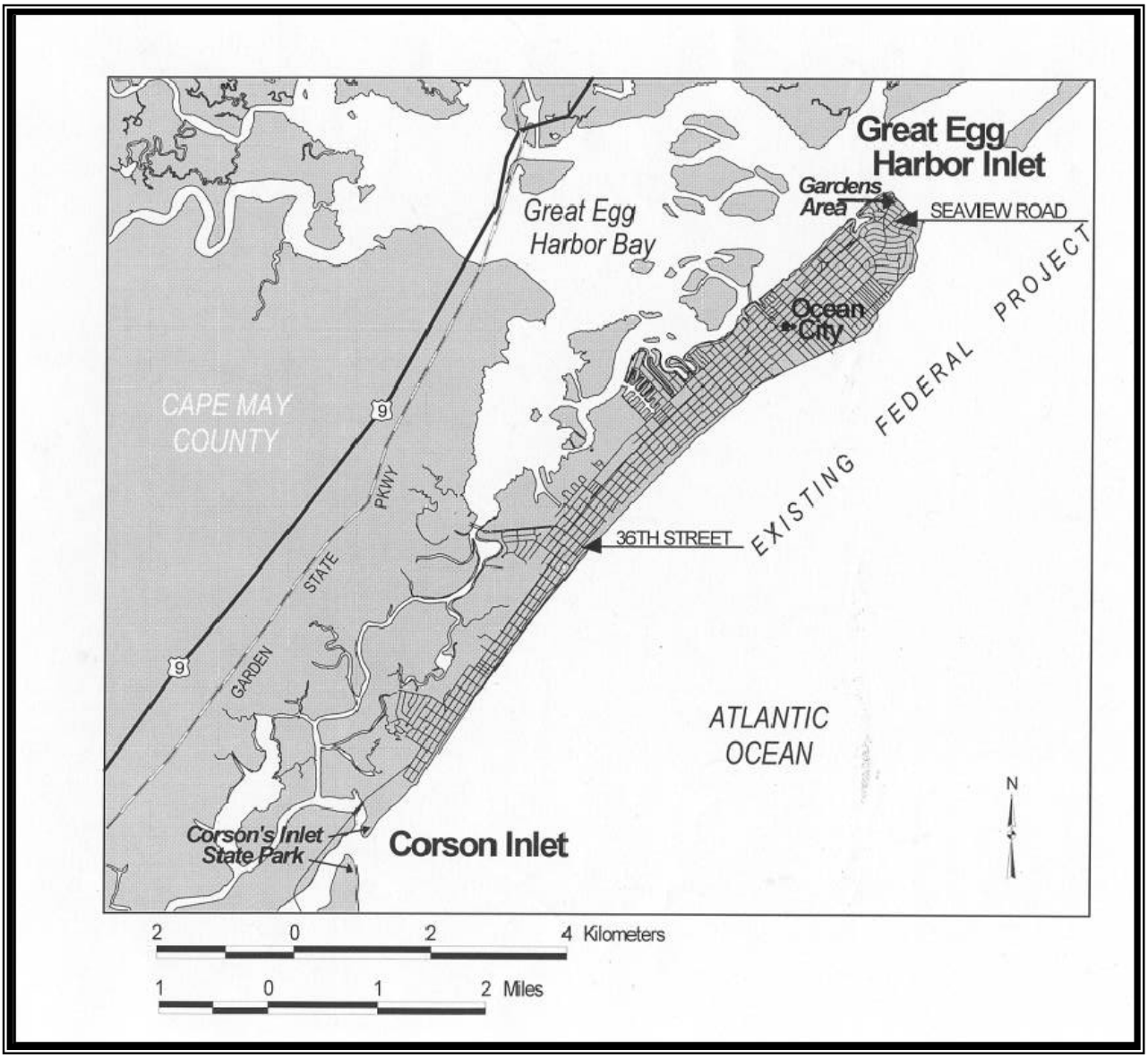
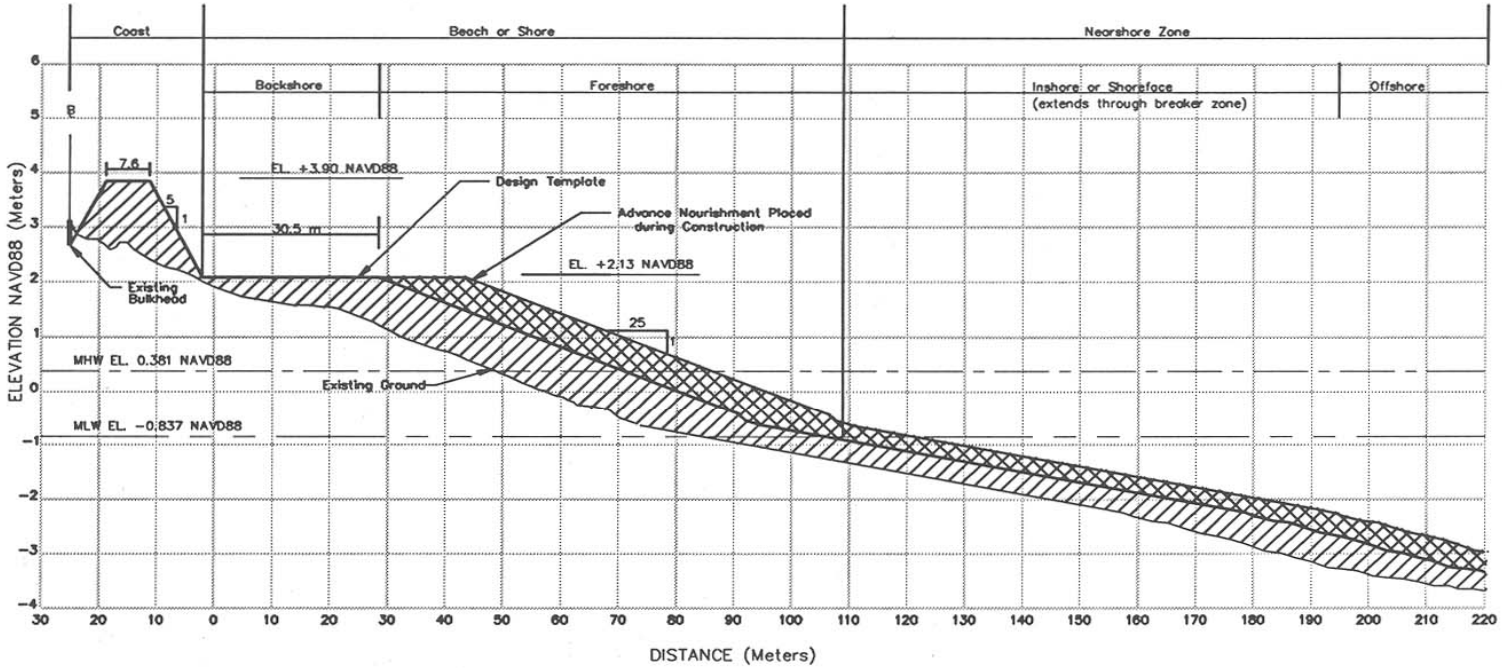


Figure 4. Ocean City Project Area



1. Depth of Closure is at-8.23 m NAVD.
2. Cross section based on OC 56.
3. Baseline runs along the bulkhead.

SCALE: AS SHOWN

GREAT EGG HARBOR INLET TO
TOWNSENDS INLET FEASIBILITY STUDY
TYPICAL CROSS SECTION
SOUTH END OCEAN CITY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
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Figure 5. Selected Plan for Ocean City, NJ - Typical Design Cross Section, 34th -59th Street

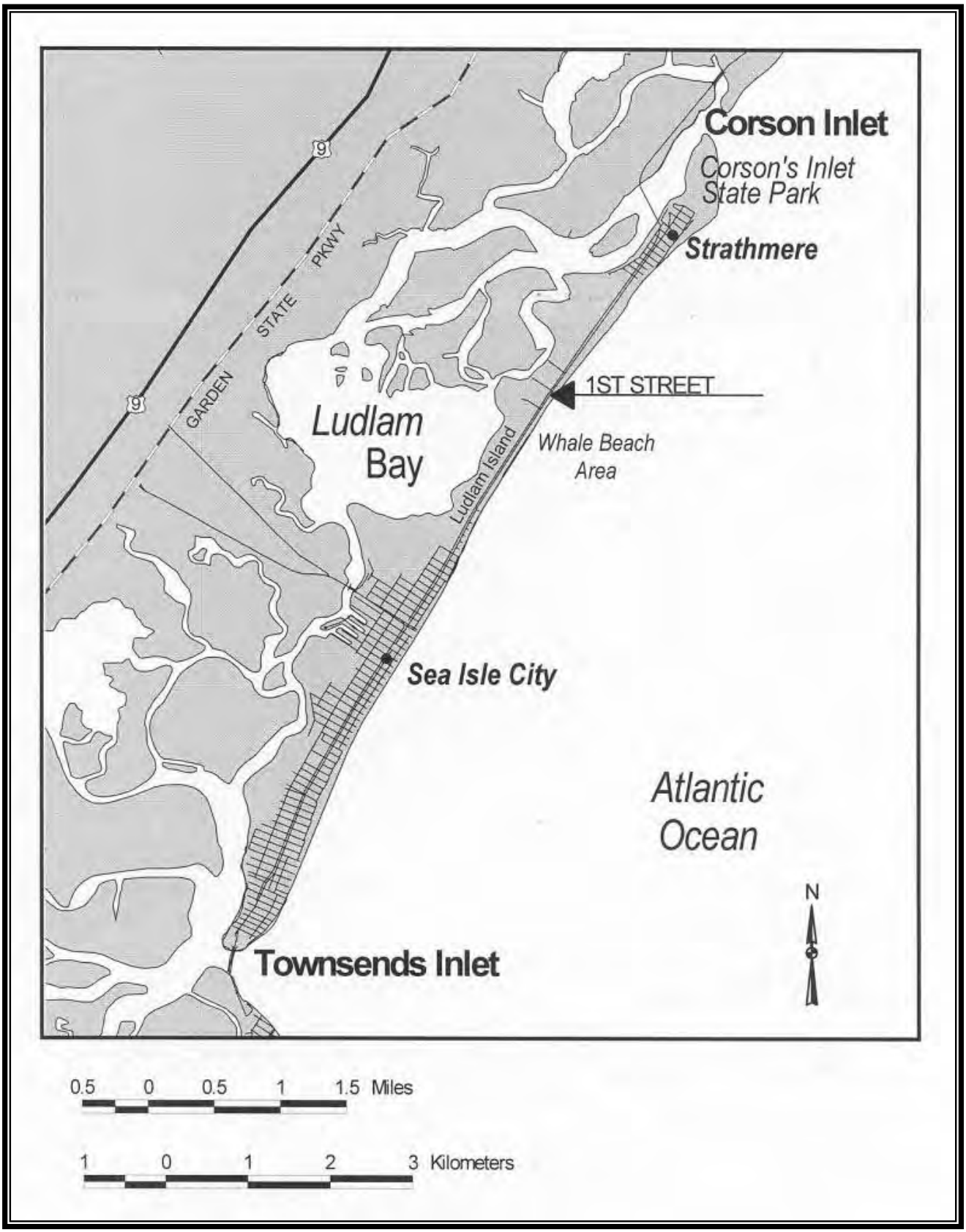


Figure 6. Ludlam Island Project Area

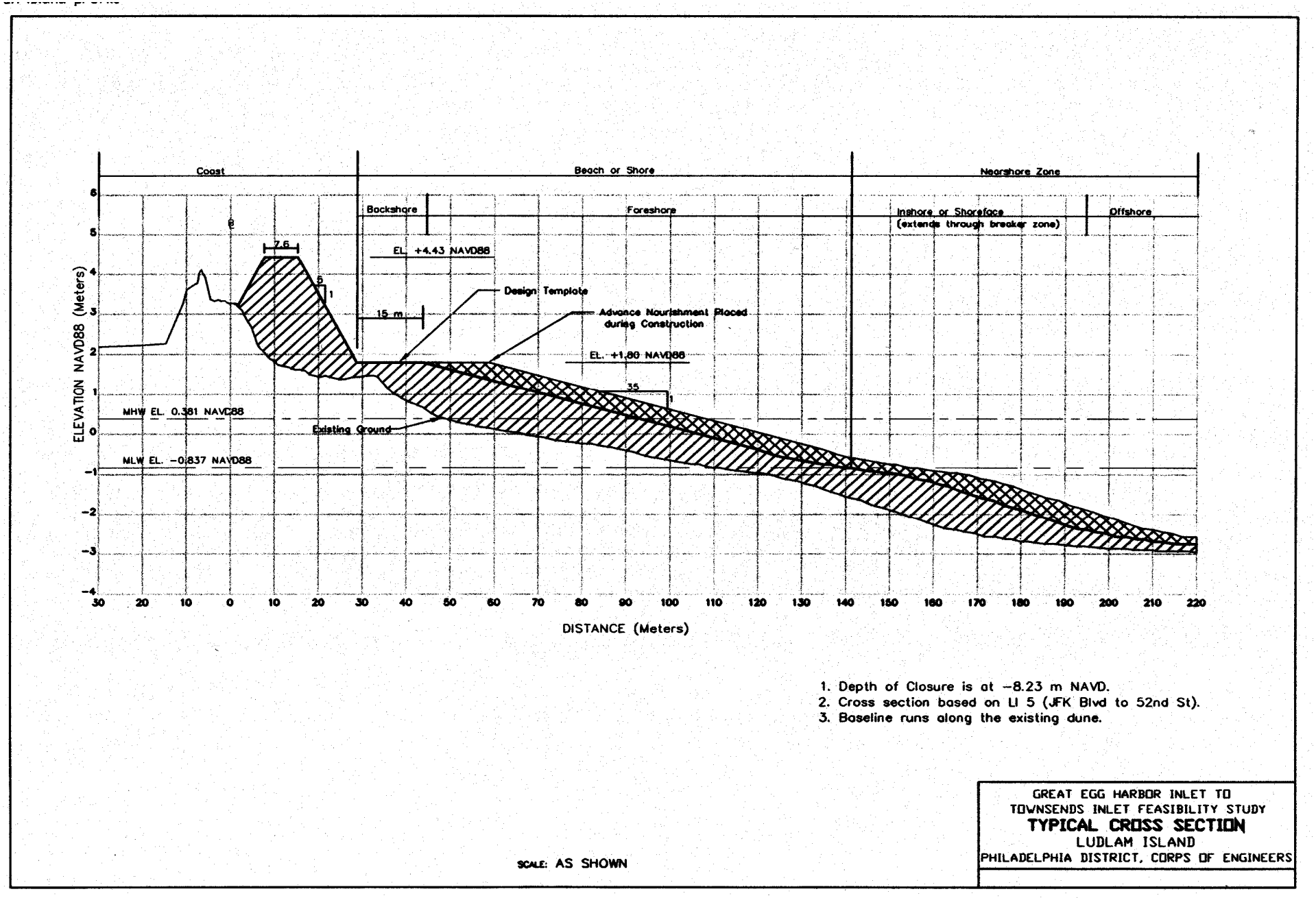
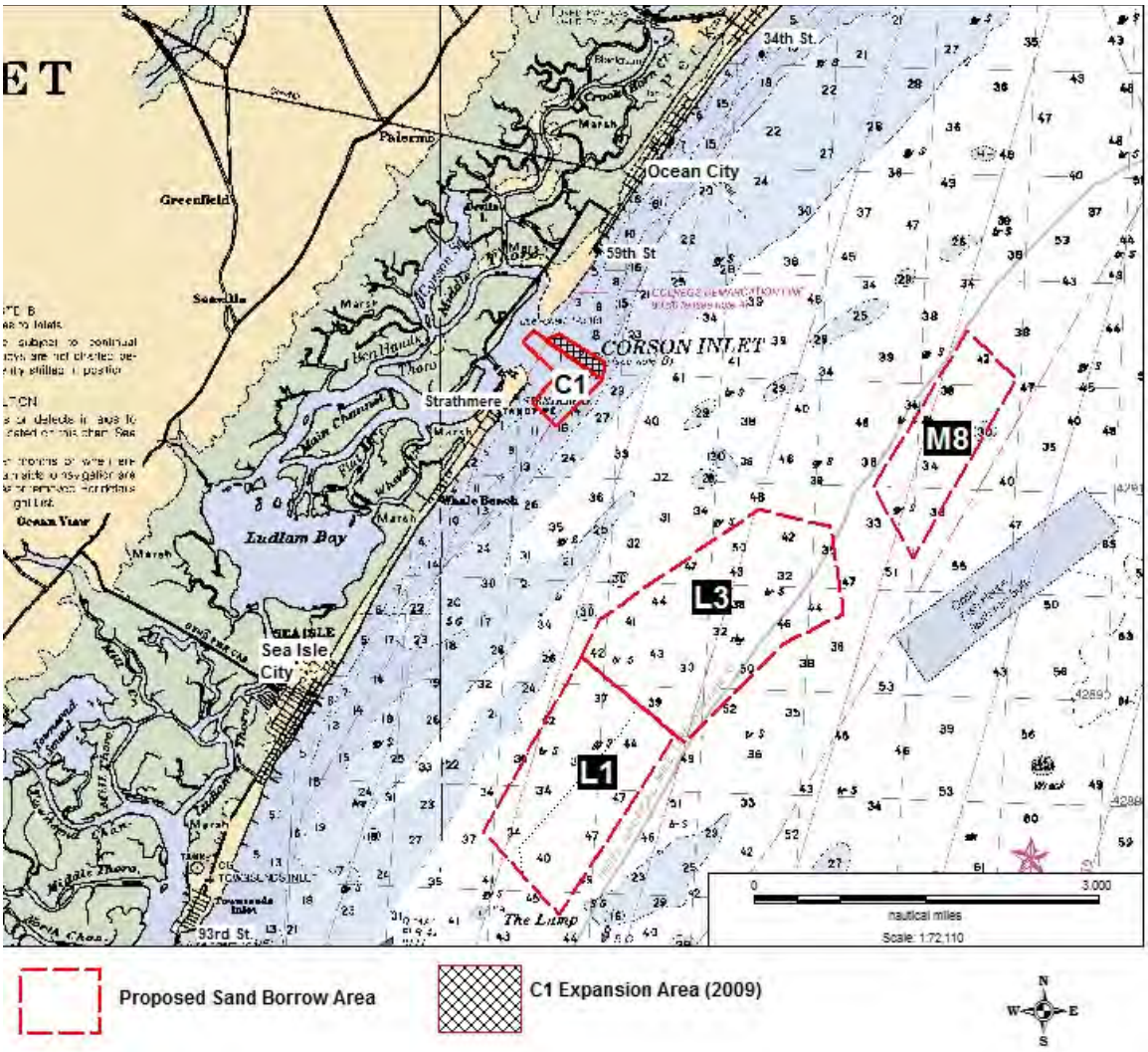


Figure 7. Selected Plan for Ludlam Island, NJ - Typical Design Cross Section



Proposed Sand Borrow Area

C1 Expansion Area (2009)

Figure 8. Proposed Sand Borrow Areas

The selected plan for Ludlam Island extends from 38 meters (125 feet) north of Seaview Avenue in Strathmere to Pleasure Ave (just beyond 93rd Street)in Sea Isle City for a total length of 10,507 meters (6.5 miles). In addition, there is a taper of 224 meters (734 feet) into Corson's Inlet State Park (Strathmere Natural Area) and a taper of 20 meters (66 feet) into the terminal groin south of 93rd Street in Sea Isle City. Total length of beachfill, including tapers, is 10,751 meters (6.7 miles). Initial sand quantity (from USACE, 2001) was 3,911,000 cu meters (5,146,000 cu yds) which included design fill quantity of 2,528,000 cu meters (3,326,000 cu yds) plus advanced nourishment of 1,383,000 cu meters (1,820,000 cu yds). Periodic nourishment (from USACE, 2001) of 1,383,000 cu meters (1,820,000 cu yds) was scheduled to occur every 5 years. Material would be taken from the borrow sources identified in this as "L3", "L1", and "C1" (Figure 8). The plan also includes the extension of two stormwater outfall pipes at both 82nd and 86th Street in Sea Isle City by 46 meters (150 feet).

The New Jersey Department of Environmental Protection is the non-Federal sponsor for this project.

4.2 Project Changes

Subsequent to USACE (2001), several modifications to the proposed project as described in USACE (2001) are necessary that result in minor changes to the selected plan, but do not change the overall scope of the project. Changes to the project involve the borrow area utilization and quantities of beachfill required. However, there are no changes to the project design template, beachfill placement locations or changes in the overall scope of the project.

Beachfill Quantities:

Beach profile surveys were conducted for the Ocean City and Ludlam Island beaches in the spring of 2013 to provide updated beachfill quantity estimates for the project plans. Table 1 provides a comparison from the required quantities reported in USACE (2001) and the current estimates. For both project areas, current sand quantities are less than the estimates in 2001 despite the erosion experienced from Hurricane Sandy. This difference can be attributed to the large beachfill project conducted by NJDEP on Ludlam Island from 2009-2011, and littoral drift losses coming from the existing Federal project in northern Ocean City into the southern end. Also, current periodic nourishment quantities are less than the estimates provided in USACE (2001). These new periodic nourishment quantities reflect a new survey data set since 2001. It should be noted that periodic nourishment quantities are an average estimate, and they may vary depending on variable erosion rates and the storm climate at the time of periodic nourishment.

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Table 1. Comparison of Beachfill Quantity Estimates from 2001 and 2013.

Project Area	2001 Sand Qty. Estimate (cubic yards)*		2013 Sand Qty. Estimate (cubic Yards)	
	Initial Construction (includes advance nourishment)	Periodic Nourishment	Initial Construction (includes advance nourishment)	Periodic Nourishment
Ocean City	1,603,000	403,000 (3 yrs.)	1,577,000	302,000 (3 yrs.)
Ludlam Island	5,146,000	1,820,000 (5 yrs.)	2,590,000	734,000 (5 yrs.)
Total	6,749,000		4,167,000	
*The feasibility study provided quantities in metric units and standard units. For easy comparison, only standard units are used here.				

Using the quantity estimates in Table 1 from 2013, total sand quantity estimates for the 50-year project life are provided in Table 2. The cumulative total sand required is approximately 19,249,000 cubic yards, which is approximately 10,000,000 cubic yards less than the original projection in USACE (2001).

Table 2. Total Sand Quantity Estimates Required Based on 2013 Estimates

Project Area	2013 Estimated Quantities (cubic yards)			
	Initial Construction (includes advance nourishment)	Total Periodic Nourishment	Major Replacement	Total 50 year estimate
Ocean City	1,577,000	5,134,000 (17 cycles)	503,000	7,214,000
Ludlam Island	2,500,000	7,340,000 (10 cycles)	2,105,000	12,035,000
TOTAL				19,249,000

Borrow Areas: The first change in the borrow area plan subsequent to USACE (2001) is to use the approved borrow area L3 for the initial construction and to defer the use of L1, M8, and a portion of L3 for periodic nourishment. M8 and a portion of L3 lie entirely within Federal waters (i.e. beyond 3 nautical miles from the New Jersey shoreline). Dredging or mining of sand from Federal waters requires approval from the Bureau of Ocean Energy Management (BOEM). Because of an expedited schedule to start initial construction, M8 and the L3 portion are not expected to be approved in time to meet this schedule. Therefore, most of L3 would be used as the sand source for initial construction. Area C1 was designated for periodic nourishment in USACE (2001), and would still remain available for periodic nourishment. Therefore, borrow areas C1, L1, M8, remaining portions of L3 in State waters, and the portion of L3 in Federal waters may all be available for use during periodic nourishment. This change in borrow area utilization would likely affect more bottom area within L3 initially due to the increase in sand requirements from this site, but will affect less overall bottom area as described in USACE (2001) .

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Another change in borrow areas since USACE (2001) is that Area C1 was expanded in 2009 by 45.8 acres to provide a sufficient volume of sand that was used for the NJDEP beachfill project on Ludlam Island (Figure 8). For this expansion, the NJDEP received all necessary approvals from the Corps of Engineers, NJDEP, US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and NJ State Historic Preservation Officer (NJSHPO). The Federal Coastal Zone consistency Determination and Section 401 Water Quality Certification for this action was granted to both NJDEP and the Philadelphia District (for the Federal project). This expansion is also needed for the proposed Federal project.

As a consequence of the proposed changes in borrow area utilization, another required change is to use these borrow areas interchangeably for the designated beach communities. USACE (2001) tied certain borrow areas to their designated beaches. For instance, M8 was designated for southern Ocean City. L3 was designated for Strathmere and Whale Beach, and L1 was designated for Sea Isle City. C1 was designated as periodic nourishment sand for Strathmere. Because of its location in an inlet ebb shoal complex, C1 is the only site out of the four sites expected to regenerate sand between nourishment cycles. The recent use of C1 by NJDEP as beachfill for Strathmere and Sea Isle City has consumed a significant amount of its capacity, but is expected to regenerate sufficient quantities for the periodic nourishment phase. The current plan is to use these areas interchangeably with the destination beaches as needed over the project life. This allows for flexibility to use these sites on an as needed basis to address any future unforeseen needs such as a loss or depletion of a source, and differences in sand requirements of destination beaches. It should be noted that this change does not add to or delete any of the sand sources as proposed in USACE (2001). However, the interchangeability of the sites introduces unpredictability of the acreages of bottom habitat affected within the sites over the project life. Utilization of the portion of Site L3 in State waters for initial construction and periodic nourishment could deplete the available sand before using the other sites. However, the remaining sites are expected to contain sufficient quantities of sand throughout the project life. Table 3 provides an estimate of acres of bottom habitat affected by dredging based on the current projected sand quantities needed. It should be noted that the acreages estimated in this table are based on a 5-foot box cut of the bottom. Dredging techniques such as the use of a hopper dredge or cutter-suction dredge (hydraulic) and depths can vary considerably within the borrow area, which would affect the overall amount of impacted bottom. However, this provides a tangible estimate of acres of borrow areas available and acres needed/disturbed. USACE (2001) estimated that (using the same 5-foot box cut), approximately 833 acres of bottom habitat would be affected in the borrow areas combined that were designated for initial construction. The current estimate is approximately 517 acres in L3 for initial construction. The reduction in periodic nourishment quantities (based on the 2013 estimate) results in a significant reduction in

impacted acres over the project life from 3,456 acres in USACE (2001) to 1,870 acres in Table 3. The 1,870 acres could be further reduced when Area C1 is utilized for periodic nourishment as this area is expected to infill and replenish itself.

Table 3. Estimates of Borrow Area Acreage Required for the Project

Project Stage	Borrow Area	Acres Available	Initial Construction Qty. (cubic yards)	Periodic Noursihment and Major Replacement Qty. (cubic yards)	Total Acres Required Assuming a 5-ft. dredge cut*
Initial Construction	L3 (in State waters)	1,825	4,167,000		517
Periodic Nourishment and Major Replacement	L3 (in State waters)	1,308		15,082,000	1,870
	L1	1,518			
	L3 (in Federal waters)	258			
	M8 (Federal Waters)	853			
	Total Acres of Offshore Sites (non-renewable)	**3,937**			
	C1 (Renewable)	243			

*The acreages estimated are based on a 5-foot box-cut, and may not fully represent the variability in dredge cuts by the type of dredge equipment being used, existing suitable sand strata thickness, and existing bathymetric features.

4.3 Recent Changes as a Result of Storms

Several changes to the project area occurred subsequent to USACE (2001). The project area experienced several significant storm events including the recent Nor' Ida Storm of 2009, Hurricane Irene (2011), and most notably the devastating storm, Hurricane Sandy, in October 2012. Prior to Hurricane Sandy, storm damages and beach erosion experienced in Strathmere and Sea Isle City required emergency beachfill and coastal engineering projects (such as a rip rap revetment along Seaview Dr. in Strathmere) that were conducted by the New Jersey Department of Environmental Protection and the local municipalities in 2008 and 2009. The beachfill project utilized approximately 1.29 million cubic yards of sand as beachfill in Strathmere and Sea Isle City in 2009, and is credited with providing reduced storm damages from Hurricane Sandy (Coastal Research Center, 2013). The beachfill in Strathmere had variable berm and dune configurations that included: Strathmere Natural Area, Seaview Ave. to Williams Ave., and Webster Ave. to Polk Ave. In Sea Isle City, a 100-foot wide berm at +7.00 ft NAVD was constructed from 1st St. to 15th St. and 40th St. to 52nd St. The sand source utilized for these projects was from Corson Inlet (identified as borrow area C1 in USACE (2001)).

After being struck by Hurricane Sandy, portions of the project area experienced storm damages to residential and commercial structures, public infrastructure and significant beach and dune erosion. Hurricane Sandy developed from a tropical wave in the western Caribbean on 22 October and was soon upgraded to Tropical Storm Sandy. On 24 October, Sandy became a hurricane and made landfall near Kingston, Jamaica. Sandy then re-emerged into the Caribbean and strengthened to Category 2. Early on 26 October, Sandy moved through the Bahamas. During 27 and 28 October, Sandy moved alongshore of the southeast U.S. coast, and reached a secondary peak of 90 mph on 29 October with a diameter of over 1,000 nautical miles. Sandy turned to the north-northwest and made landfall as a post-tropical cyclone at ~2000 EDT near Atlantic City, NJ with winds of 90 mph, causing extensive flooding, beach erosion, and coastal damage along the shorelines of Delaware, New Jersey, and New York. As Sandy approached landfall, it generated intense onshore winds, waves, and a storm surge that was augmented by astronomical spring tides associated with the full moon of 29 October. The remnants weakened over Pennsylvania and degenerated into a remnant trough on 31 October. The combined effects of wind, waves, and elevated tidal water levels led to significant erosion damage to the Great Egg Harbor Inlet to Townsends Inlet Project Area.

Following the storm, the City of Ocean City responded to the beach and dune erosion on the southern end of Ocean City by placing approximately 90,000 cubic yards of sand on the beach over a 6,000- linear foot area extending from 49th Street to 59th Street. This fill was placed via dump trucks and did not use an offshore or inlet sand source.

On Ludlam Island, Sea Isle City (with funding from the Federal Emergency Management Agency) is proposing to place approximately 500,000 cubic yards of material on the beaches at 1st to 15th Street, 30th to 52nd Street, and 73rd Street to Townsends Inlet. The sand sources proposed for this emergency action are at Corson Inlet (C1) and in Townsends Inlet. This work is proposed to begin February 2014 and end in May 2014. If implemented, this beachfill could affect the quantities of beachfill needed for the proposed Federal Corps project.

4.4 Regulatory Changes

On October 6, 2010, the National Marine Fisheries Service (NMFS) published a Notice in the Federal Register proposing to list three Distinct Population Segments (DPSs) of Atlantic sturgeon (*Acipenser oxyrhinchus oxyrinchus*) in the Northeast Region. The New York Bight DPS, which includes Atlantic sturgeon whose range occurs in watersheds that drain into coastal waters, including Long Island Sound, the New York Bight, and the Delaware Bay, from Chatham, MA to the Delaware-Maryland border on Fenwick Island, as well as wherever these fish occur in coastal bays, estuaries, and the marine environment from Bay of Fundy, Canada to the Saint Johns River, FL, was proposed for listing as endangered.

On February 6, 2012, NMFS issued two final rules (77FR 5880 and 77 FR 5914) listing five DPSs of Atlantic sturgeon as threatened or endangered under the Endangered Species Act (ESA). The effective date of the listing was April 6, 2012. Since 1996, dredging projects have been conducted in the Philadelphia District in accordance with the Biological Opinion (NMFS, 1996) that provides conservation recommendation and reasonable and prudent measures for the shortnose sturgeon (*Acipenser brevirostrum*), four species of sea turtles, and marine mammals. By letter of February 21, 2013, the Philadelphia District reinitiated consultation in accordance with 50 CFR 402.14(c) under Section 7 of the Endangered Species Act to address the District's beach nourishment projects' effects on Atlantic Sturgeon and the sea turtles/marine mammals previously covered in NMFS (1996). A Programmatic Biological Assessment is currently being prepared by the Philadelphia District to cover all existing and proposed storm damage reduction projects within the Philadelphia District. This will be followed by a new BO to be issued by NMFS. In the interim, the Philadelphia District has determined that allowing the District's beach nourishment program to continue to operate during the re-initiation period will not violate Section 7(a)(2) or 7(d). This also includes projects that are presently authorized, but unconstructed such as the Great Egg Harbor Inlet to Townsends Inlet Storm Damage Reduction Project. This determination was made as part of coordination with the National Marine Fisheries Service (see Appendix A). The Philadelphia District recognizes that this 7(a)(2) determination is only applicable during the re-initiation period, and does not address the Corps' longer term obligation to ensure the action is not likely to jeopardize the continued existence of listed species.

Subsequent to USACE (2001), the *rufa* subspecies of the red knot (*Calidris canutus rufa*) was added to the list of Federal candidate species in 2006 due to the high magnitude of imminent threats to the subspecies, and the U.S. Fish and Wildlife Service (USFWS) is currently determining whether to designate it as threatened or endangered. Since 2006, listing has been precluded by other, higher priority listing actions. The Service is now preparing a Proposed Rule to list the species as either threatened or endangered. The Service must also consider whether there are areas of habitat believed to be essential to red knot conservation. If prudent and determinable, those areas will be proposed for designation as Critical Habitat. Transient red knots may be found anywhere along New Jersey's coasts. Concentrations of migrating birds are known to occur in Cumberland, Cape May, and Atlantic Counties ("Red Knot - New Jersey Field Office - U.S. Fish & Wildlife Service." *Red Knot - New Jersey Field Office - U.S. Fish & Wildlife Service*. N.p., n.d. Web. 24 July 2013. http://www.fws.gov/northeast/njfieldoffice/endangered/redknot.html).

In 2006, the Philadelphia District received a Federal Coastal Zone Consistency Determination (Fedcon) and Section 401 Water Quality Certification (WQC) from the New Jersey Department of Environmental Protection (NDEP) (Appendix A). These authorizations committed the Philadelphia District and the

non-Federal sponsor NJDEP – Bureau of Coastal Engineering (BCE) to a number of conditions including monitoring for surfclams (*Spisula solidissima*) prior to construction, cultural resource monitoring, to secure agreements from local municipalities to manage beaches for threatened and endangered species, coordinate with the Office of Natural Lands Management to monitor for endangered and rare plants and insects within the Strathmere Natural Area, and to provide adequate public access to beaches that receive nourishment. In 2009, a modification to the Fedcon and WQC was issued by the NJDEP to address an expansion of Borrow Area C1.

4.5 No Action:

No action assumes that there would be no Federal involvement for storm damage reduction within the project area. USACE (2001) documented the vulnerabilities of the project area communities to storm damages associated with erosion, inundation and wave damages from the Atlantic Ocean. No action was eliminated early in the screening process because it did not meet the planning objectives for erosion protection, inundation protection and wave attack protection. Recent storms have demonstrated the vulnerability of this area to these types of damages. The southern end of Ocean City especially from 49th to 59th Streets experienced the most significant beach erosion and dune losses from Hurricane Sandy, which resulted in flooding on the ocean side in this stretch. Although structural damages were not severe, the vulnerability of this part of the coastline prompted the City of Ocean City to place approximately 90,000 cubic yards of sand to construct a dune-like structure immediately after the hurricane event. Sea Isle City and Strathmere experienced some dune overtopping and beach erosion from Hurricane Sandy, but did not suffer severe damages, which is attributed to a State of New Jersey beachfill project conducted a few years before the event. Based on the vulnerabilities of the project area to storm damages as demonstrated in USACE (2001), and the recent storms experienced in the project area, no action still does not meet the planning objectives, and is not considered further. An economic re-analysis of the selected storm damage reduction plan was conducted as part of a Limited Reevaluation Report (USACE, 2013), and concluded that the storm damage reduction plan is affirmed with a benefit to cost ratio of 1.7. Therefore, the selected plan with the proposed modifications is recommended for implementation.

5.0 AFFECTED ENVIRONMENT

USACE (2001) provided a comprehensive discussion on affected resources within the project area. A review of the affected environmental resources was conducted to determine if significant changes have occurred or if new information has become available since completion of USACE (2001). This review is presented as Table 4. Resource topics that do not require further discussion are

incorporated by reference and are not discussed further. Resources that require further discussion are presented as indicated in Table 4.

Table 4. Status of Affected Resources

Resource Topic	Incorporate By Reference	Have There Been Any Significant Changes or New Information Since USACE (2001)?	Notes
General Environmental Setting	USACE (2001)	No	Although the area was affected by significant storm events, the overall environmental setting has not changed significantly since 2001.
Soils	USACE (2001)	No	No significant changes since 2001.
Mineral Resources	USACE (2001)	Yes	2 offshore borrow areas require approval from BOEM to extract sand resources.
Air Quality	USACE (2001)	Yes	A CAA analysis was conducted in 2010 and was updated based on current plan.
Water and Sediment Quality	USACE (2001)	Yes	Updates in State water quality testing. Contaminants analysis screening was performed on the proposed sand borrow area sediments in 2004.
Wetland Habitats	USACE (2001)	No	Some back-bay tidal wetland losses and storm-related debris deposition may have occurred since 2001. No wetland areas in affected project area.
Dune Habitat	USACE (2001)	Yes	Dune habitats experienced erosion from storm damages. Vegetation, shape and extent of dunes have been modified.
Upper Beach Habitat	USACE (2001)	Yes	Beaches experienced erosion due to storm damages.
Intertidal Zone Habitat	USACE (2001)	No	No significant change. Some storm-related debris could be in surf zone. No significant changes to benthic

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Table 4. Status of Affected Resources			
Resource Topic	**Incorporate By Reference**	**Have There Been Any Significant Changes or New Information Since USACE (2001)?**	**Notes**
			communities expected.
Nearshore and Offshore Zone Habitats	USACE (2001)	No	No significant change. Some storm-related debris could be in nearshore. No significant changes to benthic communities expected.
Benthos (intertidal and nearshore)	USACE (2001)	No	Although the beaches were significantly affected by storm-related erosion, the benthic community is not expected to have been significantly altered due to its inherent resilience and adaptability in this dynamic environment.
Benthos (offshore)	USACE (2001)	Yes	No change in offshore benthic communities, but changes in offshore borrow area usage require discussion.
Shellfish	USACE (2001)	Yes	A sharp recent decline in surfclam stocks in the areas has been documented by resource agencies. No recent information is available for commercial surfclam stocks within the sand borrow areas.
Finfish	USACE (2001)	Yes (borrow areas)	In a coordination letter from NMFS, it was requested to consider the effects of using borrow Area C1 (Corson Inlet) on species that utilize the inlet to access the back bay estuaries. Project changes are not expected to change effects on intertidal zone or nearshore areas.

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Table 4. Status of Affected Resources			
Resource Topic	**Incorporate By Reference**	**Have There Been Any Significant Changes or New Information Since USACE (2001)?**	**Notes**
Prime Fishing Areas	USACE (2001)	Yes	Prime Fishing Areas as identified in NJAC 7:7E-3.4 have been modified since 2001.
Essential Fish Habitat	USACE (2001)	Yes	As per coordination with NMFS, an updated EFH assessment is required.
Birds	USACE (2001)	Yes	Some primary dune habitats damaged by storms.
Mammals (terrestrial)	USACE (2001)	Yes	Some primary dune habitats damaged by storms.
Mammals (marine)	USACE (2001)	Yes	Updated discussion of noise and effects on marine life.
Threatened and Endangered Species	USACE (2001)	Yes	Atlantic sturgeon listing requires Section 7 consultation. Interim measures are being implemented as per agreement with NMFS. Streamlined consultation as per USFWS (2005) for piping plovers and seabeach amaranth is required prior to construction.
Reserves, Preserves Parks and Public Land	USACE (2001)	Yes	Strathmere Natural Area experienced severe erosion. It was rebuilt in 2011 by NJDEP beachfill. Corson's Inlet S.P. experienced significant dune losses and beach erosion from storms.
Recreation	USACE (2001)	No	No significant changes since 2001.
Land Use	USACE (2001)	No	No significant changes since 2001.
Visual and Aesthetic Values	USACE (2001)	No	Some localized changes to dunes and beach from storm damages. Dunes exhibit some scarping and loss of vegetation on seaward face. Recently reconstructed

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Table 4. Status of Affected Resources			
Resource Topic	**Incorporate By Reference**	**Have There Been Any Significant Changes or New Information Since USACE (2001)?**	**Notes**
			dunes have no vegetation. Storm debris and structural damages from the storms have been addressed or are currently being addressed by local authorities.
Noise	USACE (2001)	Yes	Updated discussion of noise and effects on marine life.
Cultural Resources	USACE (2001)	Yes	Expansion of Borrow Area C1 was investigated in 2009,
Hazardous, Toxic and Radioactive Waste (HTRW)	USACE (2001)	No	No significant changes since 2001.
Socioeconomics	USACE (2001)	No	A reanalysis of the socioeconomics of the project area will be conducted as part of a Limited Re-evaluation Report (LRR) to be completed in August 2013

5.1 Mineral Resources

Two offshore borrow areas (M8- 852 acres) and a 258-acre portion of Borrow Area L3 lie outside of New Jersey State Waters and fall under Federal jurisdiction pursuant to the 1953 Outer Continental Shelf (OCS) Lands Act (43 U.S.C. 1331 et seq.; 43 U.S.C. 1801 et seq.). Under this Act, the Secretary of the Interior has direct responsibility for administration of oil, gas and mineral exploration; for development of the OCS; and for formulation of regulations to meet provisions of the Act. These functions are centralized under the U.S. Department of the Interior – Bureau of Ocean Energy Management (BOEM) (formerly the Minerals Management Service (MMS). Because these two sites would make use of Federal OCS sand resources, coordination was initiated during the feasibility study in regards to site locations and pertinent site data. Prior to utilization of Site M8 and a portion of L3, a project-specific Memorandum of Agreement (MOA) between the USACE and BOEM will need to be negotiated and executed concerning the use of these two sites. However, because of the time constraints under the expedited schedule for initial construction of this

project under P.L. 113-2: Disaster Relief Appropriations Act (FY 2013), M8 and the portion of L3 will not likely be available in time for use. Therefore, initial construction will have to rely on L1 and the portion of L3 that is within state waters. Coordination with BOEM for the use of M8 and part of L3 for periodic nourishment is being re-initiated in order to comply with Outer Continental Shelf Lands Act.

5.2 Air Quality

USACE (2001) described the air quality in the project area. The U.S. Environmental Protection Agency (EPA) adopts National Ambient Air Quality Standards (NAAQS) for the common air pollutants, and the states have the primary responsibility to attain and maintain those standards. Through the State Implementation Plan (SIP), The New Jersey Department of Environmental Protection – Division of Air Quality manages and monitors air quality in the state. The goal of the State Implementation Plan is to meet and enforce the primary and secondary national ambient air quality standards for pollutants. New Jersey air quality has improved significantly over the last 40 years, but exceeds the current standards for ozone (O_3) throughout the state and fine particles (PM_{10} or $PM_{2.5)}$ in many urban areas. New Jersey has attained the sulfur dioxide (SO_2) (except for a portion of Warren County), lead (Pb), and nitrogen dioxide (NO_2) and Carbon Monoxide (CO) standards. The New Jersey Division of Air Quality also regulates the emissions of hazardous air pollutants (HAPs) designated by the U.S. EPA (accessed from internet website on 7/15/2013 at http://www.state.nj.us/dep/daq/).

The Clean Air Act requires that all areas of the country be evaluated and then classified as attainment or non-attainment areas for each of the National Ambient Air Quality Standards. Areas can also be found to be “unclassifiable” under certain circumstances. The 1990 amendments to the act required that areas be further classified based on the severity of non-attainment. The classifications range from “Marginal” to “Extreme” and are based on “design values”. The design value is the value that actually determines whether an area meets the standard. For the 8-hour ozone standard for example, the design value is the average of the fourth highest daily maximum 8-hour average concentration recorded each year for three years. Their classification with respect to the 8-hour standard is shown in Figure 9. Ground-level ozone is created when nitrogen oxides (NOx) and volatile organic compounds (VOC’s) react in the presence of sunlight. NOx is primarily emitted by motor vehicles, power plants, and other sources of combustion. VOC’s are emitted from sources such as motor vehicles, chemical plants, factories, consumer and commercial products, and even natural sources such as trees. Ozone and the pollutants that form ozone (precursor pollutants) can also be transported into an area from sources hundreds of miles upwind. The study area falls within the Southern Coastal Region, which covers Cape May and Atlantic Counties. The entire state of New Jersey is in non-

attainment and is classified as being “Marginal.” A “Marginal” classification is applied when an area has a design value of 0.085 ppm up to but not including 0.092 ppm (NJDEP, 2012 Ozone Summary).

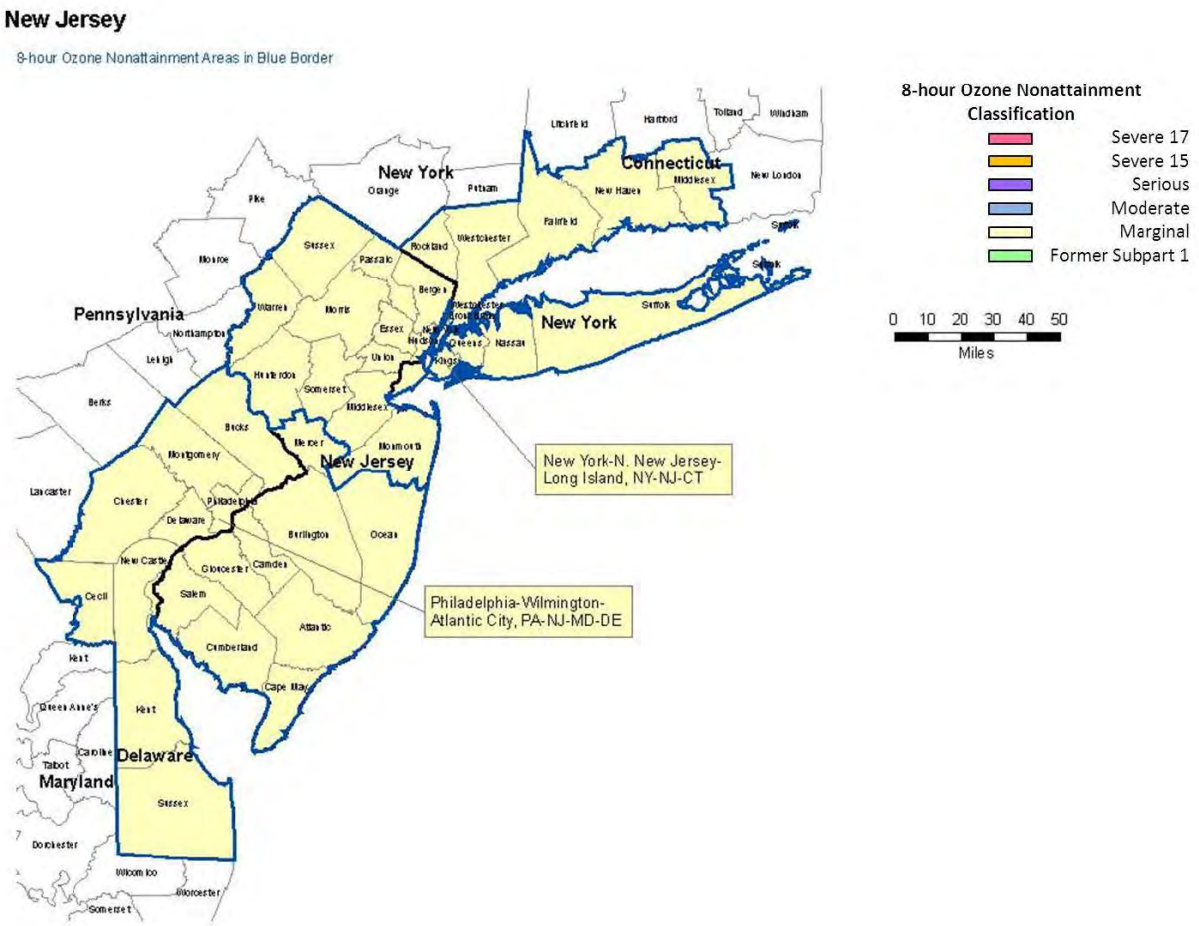


Figure 9. New Jersey Non-Attainment Areas for Ozone (Source: NJDEP, 2012).

5.3 Water and Sediment Quality

Water and sediment quality within the project area were discussed in USACE (2001). Scott and Bruce (1999) and Scott and Wirth (2000) measured water quality in two of the proposed offshore sand borrow areas (L1 and L3) in September and October 1998 and November 1999. Temperature, pH, dissolved oxygen (DO), conductivity, and salinity were measured relative to depth. The measurements taken found the water columns to be fairly homogeneous with little differences detected between sites. Most of the water column measurements showed no evidence of stratification except DO, which was slightly lower for most of the stations at the sediment interface (bottom) than at the water surface. Water temperatures were slightly higher in September than those in October.

Water quality is generally indicated by measuring levels of the following: nutrients (nitrogen/phosphorus), pathogens, floatable wastes, and toxins. Rainfall is an important parameter for studying water quality; runoff leads to non-point source pollution and fresh water (rainfall, ground water seepage, runoff, and river discharge) can ultimately affect hydrodynamic circulation in the ocean. Ocean and bay recreational beaches are subject to opening and closing procedures of the State Sanitary Code and must be resampled when bacteria concentrations exceed the primary contact standard of 104 enterococci per 100 ml of sample. Consecutive samples that exceed the standard require the closing of the beach until a sample is obtained that is within the standard. If a sample result is shown in red, the sample has exceeded the monitoring standard for bacteria. Additional samples are collected at that location and results posted on the next day.

Elevated enterococci counts along the coast of New Jersey may result from failing septic tanks, wastewater treatment plant discharges, combined sewer overflows, stormwater drainage, runoff from developed areas, domestic animals, wildlife and sewage discharge from boats. Point source discharges from coastal wastewater treatment facilities can affect water quality at bathing beaches. Accordingly, the NJDEP routinely monitors the treatment of effluent at these facilities, to ensure that they operate in accordance with the requirements of their permits. For recreational beaches, the health agency also surveys the area visually and collects additional samples ("bracket samples") at either side of the station to determine the extent of the pollution and possible pollution sources. The results of the bracket samples determine the extent of restrictions imposed along the shore and the number of beaches closed.

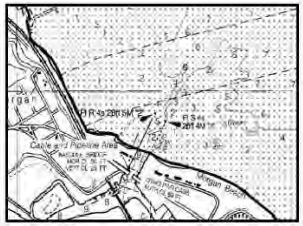
Between 2012 and July 2013, the Cape May County Health Department sampled recreational beach water for bacteria and pathogens. Sampling was conducted once a week during the swimming season. During the 2012 summer swimming season in Cape May County, water quality criteria were exceeded within Ocean City at several beaches on August 6 and September 4th and at one Sea Isle City Beach on May 29th. In 2013 to date (July 8th) there have been two exceedances in Ocean City on June 3rd and July 1st. Most of the exceedances in Ocean City were at the northern end of Ocean City and are outside of the project impact area (data obtained from internet website: http://www.nj.gov/dep/beaches/cc.html on 7/16/2013).

In addition, the NJDEP monitors coastal waters for human pathogens and indicator bacteria to determine the suitability for shellfish harvest. There are three distinct areas along the ocean coast within the study area where shellfish harvests are prohibited based on water quality (Figures 10 to 12). Prohibited shellfish areas are waters condemned for the harvest of oysters, clams and mussels. The first prohibited area extends from the northern terminal groin of Ocean City along Great Egg Harbor Inlet and extends south to 34th St. This area is delineated by width from the beach to the seaward edges of the groins. This

SHELLFISH GROWING WATER CLASSIFICATION CHARTS ARE A GRAPHIC REPRESENTATION OF THE CLASSIFICATION REGULATIONS AND ARE PROVIDED FOR GENERAL INFORMATION ONLY. SEE N.J.A.C. 7:12-1 ET SEQ. FOR THE FULL TEXT AND AREA DESCRIPTIONS.

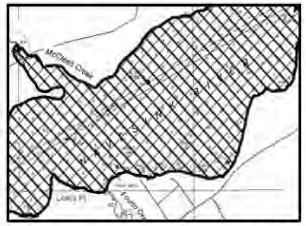
NOTE:
These charts are provided for the purpose of delineating shellfish growing water classifications, and are not intended to be used for navigational purposes.

SHELLFISH GROWING WATER CLASSIFICATION CODES



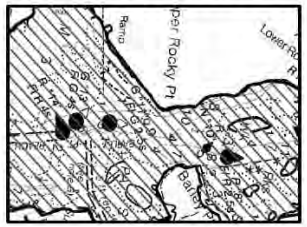
PROHIBITED AREA

Waters condemned for the harvest of oysters, clams and mussels.



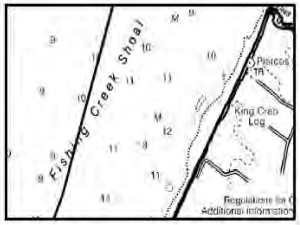
SPECIAL RESTRICTED AREA

Waters condemned for the harvest of oysters, clams and mussels EXCEPT harvesting for further processing may be done under special permit from the State Department of Environmental Protection.



SEASONAL AREA

Waters which are condemned for the harvest of shellfish but open by operation of regulations according to the schedule at 7:12-4.1 and 4.2; refer to specific charts for seasonal dates where applicable.



APPROVED AREA

Waters approved for the harvest of oysters, clams, and mussels.

PROHIBITED AREAS FOR HARVESTING

1. ALL MARINAS, MAN-MADE LAGOONS, ANCHORAGES OR OTHER PLACES WHERE DOCKING OR MOORING FACILIITES ARE PROVIDED FOR BOATS

Definition: A marina is any structure (docks, floating docks, piers, that supports five or more boats) built on or near the water which is utilitized for docking, storing or otherwise mooring vessels and usually but not necessarily providing service to vessels such as repairing, fueling, security, or other related activities.

2. LEASED AREAS

Harvesting from leased shellfish lots is restricted to the lessee. These lots are delineated by stakes or set by the lease holder. Charts of leased areas may be examined at either the Nacote Creek or Bivalve Shellfish Offices.

HARVESTING REGULATIONS

Shellfish cannot be taken before sunrise or after sunset or on Sundays, except as provided in N.J. Stat. § 50:2-11. Hard clams harvested must be at least 1 ½ inches in length. No one may take or catch more than 150 clams per day or sell or offer for sale clams, unless he or she is a holder of a Commercial Shellfish License.

PENALTY FOR ILLEGAL SHELLFISHING

Harvesting shellfish illegally is punishable in the following manner:

1st Offense - Petty Disorderly Persons
Fines up to $500 and/or up to 30 days imprisonment
2nd Offense - Disorderly Persons
Fines up to $1000 and/or up to 6 months imprisonment

POSSIBLE SEIZURE AND FORFEITURE OF BOAT AND EQUIPMENT FOR ANY OFFENSE

Additional penalties for illegal shellfishing can include the loss of the privilege to take oysters, clams or other shellfish, for a period of three years for a first offense, five years for a second offense, and 10 years for the third offense and any subsequent offense.

CONDEMNED AREA SIGNS

TO AID IN THE DELINEATION OF SHELLFISH GROWING WATERS, CERTAIN AREAS ARE POSTED WITH THE FOLLOWING SIGNS:

HELP TO PREVENT OVERBOARD DISCHARGES

Please be aware that overboard discharges from harvesters' boats have been linked to illness outbreaks associated with shellfish. It is recommended that all harvesters have a Type III Marine Sanitation Device in the harvester's vessel when harvesting shellfish and shall properly dispose of any sanitary waste. Pursuant to 33 CFR 159.53, a Type III MSD is a device that prevents the overboard discharge of treated or untreated sewage or any waste derived from sewage. This type of device includes but is not limited to a holding tank or a bucket with a secure lid. It is a violation of the NJ Water Pollution Control Act to discharge pollutants without a permit authorizing the discharge. If you have any questions about the location of Pumpout Stations, please call the New Jersey Division of Fish and Wildlife at (609) 748-2056.

To report an environmental incident impacting NJ, call 1-877-WARNDEP

Figure 10. NJ Shellfish Growing Water Classification Codes (NJDEP, 2012)

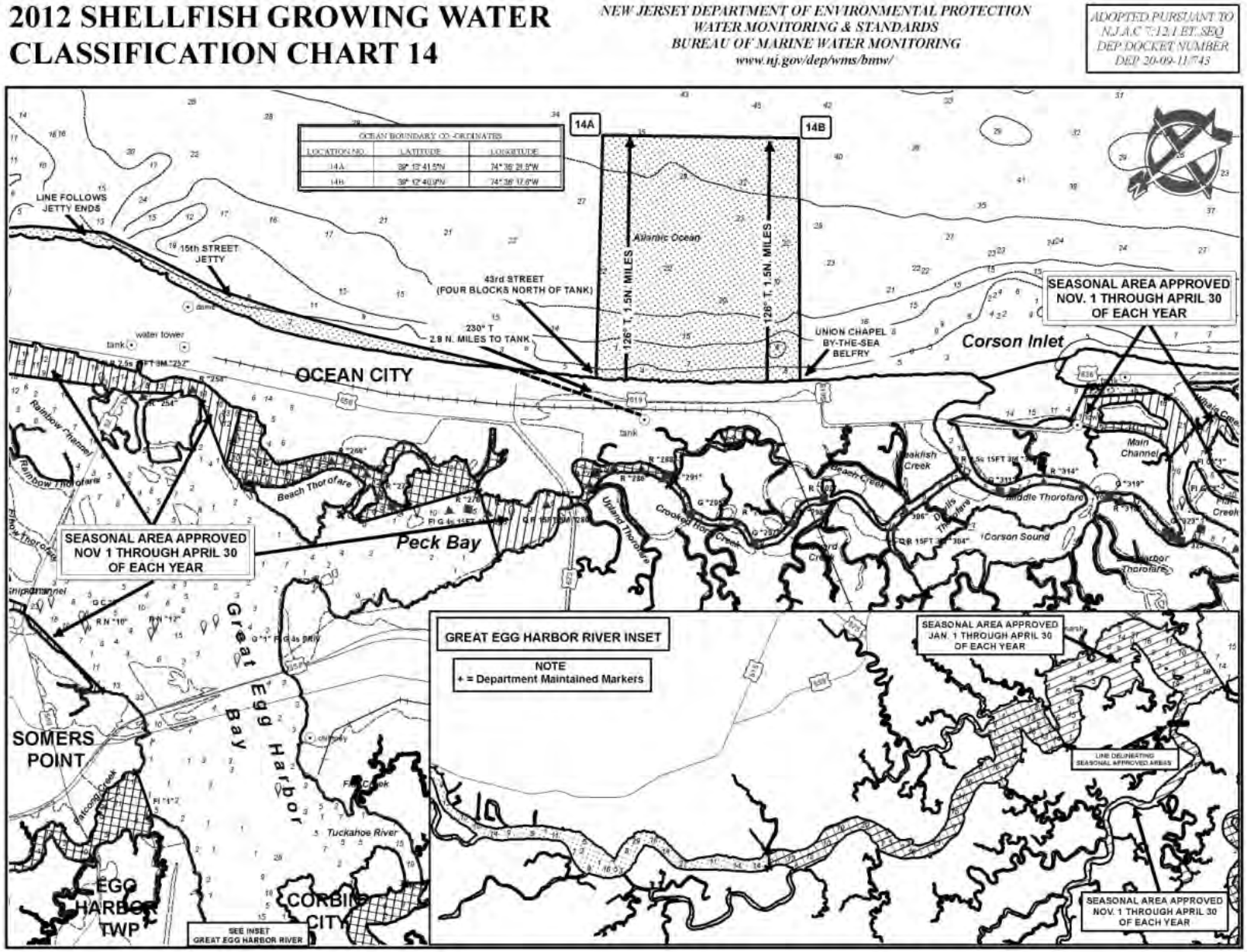


Figure 11. NJ 2012 Shellfish Growing Water Classification Chart 14 (NJDEP, 2012).

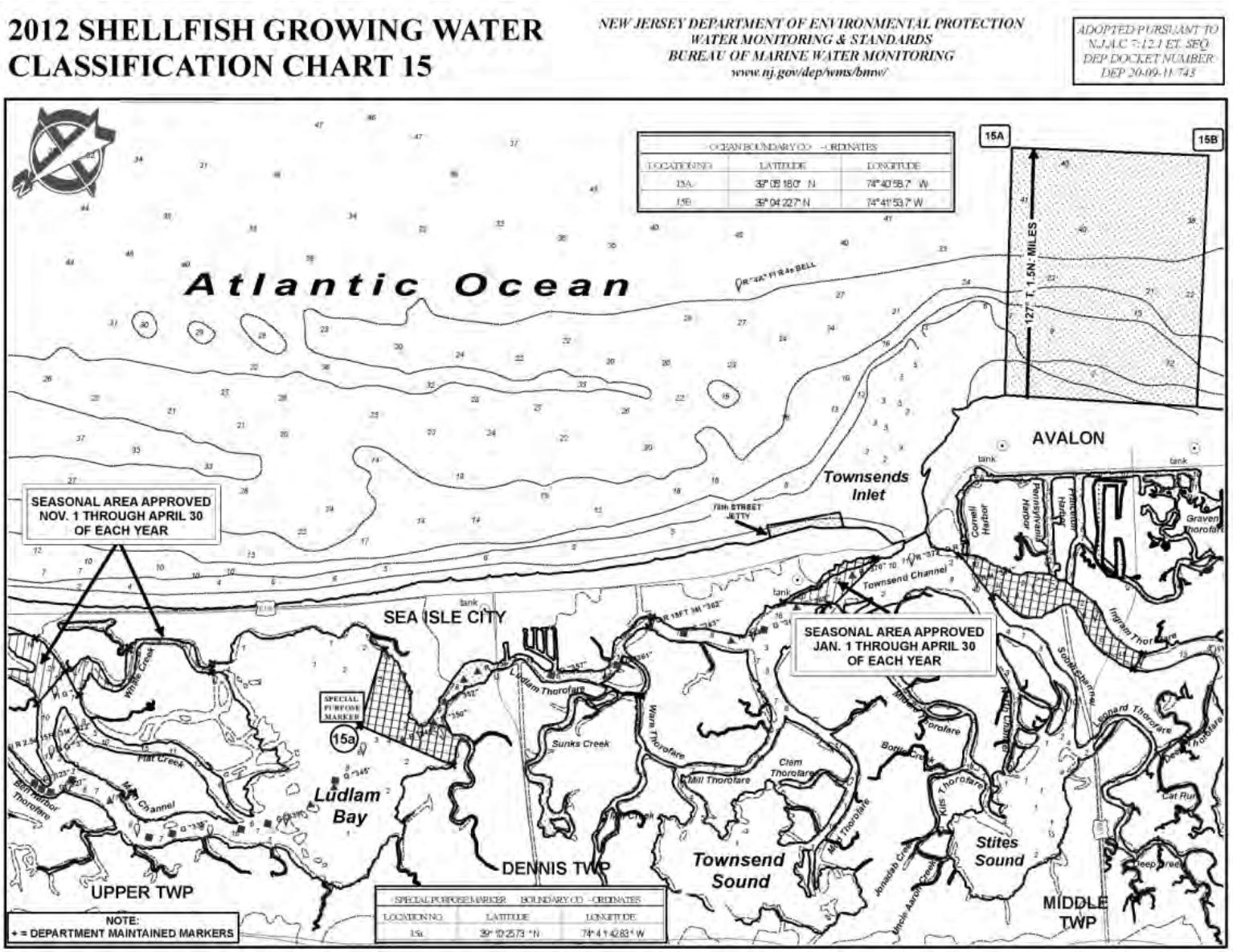


Figure 12. NJ 2012 Shellfish Growing Water Classification Chart (NJDEP, 2012).

classification is based on urban runoff entering into storm drains that discharge into the ocean along this stretch. The second prohibited shellfish area extends from Ocean City 43rd St. and extends south to the 55th St. This area is delineated by width from the beach extending seaward approximately 2.75 kilometers (1.5 nautical miles). This area is based on the existence of a sanitary sewer line that extends seaward approximately 1.68 kilometers (5,500 feet) from the shoreline. This sanitary sewer line is operated by the Cape May Municipal Utilities Authority's Ocean City Wastewater Treatment Plant. The third prohibited area within the study area is located along the ocean coast from the Townsends Inlet area of Sea Isle City south to Stone Harbor. This classification is based on the Cape May County Municipal Authority's Avalon Wastewater Treatment Plant, which has a sanitary sewer outfall that extends approximately 1.46 kilometers (4,800 feet) seaward from the shoreline in Avalon (NJDEP, 1996 and NJDEP, 1997).

Subsequent to USACE (2001), bulk sediment and bottom water samples were obtained from within the proposed sand borrow areas to screen for contaminants (Versar, 2004). The result of the bulk sediment testing for inorganics at the four proposed borrow sites (L1, L3, M8 and C1) revealed that none of the parameters were over NJDEP soil cleanup criteria for residential and non-residential soils. Comparison of the inorganic results to the NOAA sediment guidelines (Long, MacDonald, Smith, and Calder, 1995) also showed that all concentrations were below Effects Range-Low (ER-L) and Effects Range-Median (ER-M) values suggesting that the borrow site sediments are not toxic to aquatic organisms. Similar results were observed for the analyses of semivolatile organics, pesticides, PCBs, and cyanide. In most cases, these parameters were not detected in the bulk sediment tests. No values were above NJDEP soil cleanup criteria or NOAA sediment guidelines. Low levels of the pesticide Gamma Chlordane were observed slightly over detection limits at Station 4 in Borrow Area M8 and at both of the stations sampled at the Corson Inlet borrow area. Inorganic testing of the bottom water samples taken at each of the four borrow sites indicated that, with the exception of silver, all concentrations were below NJDEP acute and chronic water quality criteria. Silver concentrations in the Corson Inlet (0.114 mg/l), M8 (0.116 mg/l), and L3 (0.0086 mg/l) samples were over the 0.0019 mg/l acute criteria. Results of semi-volatile organics, pesticides, PCBs and cyanide were not detected above detection limits in bottom water samples within the borrow areas (Versar, 2004).

5.4 Dune and Upper Beach Habitat

As discussed in USACE (2001) natural dunes or remnants of ones are present within the study area, especially at Corson's Inlet State Park and

Strathmere State Natural Area. Flora typical of primary and secondary dunes were described.

Following Hurricane Sandy, beach and dune erosion were documented in a post-storm survey conducted by The Richard Stockton College of NJ Coastal Research Center (CRC) within the project area. In Sea Isle City and Strathmere, the CRC attributed a 2009 beachfill conducted by the State and local municipalities for reducing damages from Hurricane Sandy in these locales. In both municipalities, however, it was reported that Sandy produced flattening of the beach, minor breaching and over-topping of the dunes, but no catastrophic damages. The southern Corson Inlet Shoreline, which composes the Strathmere Natural Area of Corson's Inlet State Park, was severely eroded in 2008, but received a substantial beachfill by the State in 2009. This area fared well during Hurricane Sandy and remained relatively in-tact. The shoreline on the north side of Corson's Inlet experienced severe erosion into the heavily vegetated dune further inland. This beach and dune erosion (along with littoral transport) contributed huge volumes of sand to be deposited offshore of the beach. Significant loss of primary dune and beach erosion was noted along the southern end of Ocean City where large scale wash over and inundation of the lower sections of the dune were noted. Here, damage was substantial where waves flowed against, around and beneath 10 blocks of homes. Sand that was deposited landward was soon pushed back to the beach to form a dune ridge line to provide protection to this highly vulnerable area (Coastal Research Center, 2013). With damage to the dunes, vegetation along with habitat values for some wildlife was substantially or completely lost.

5.5 Benthos

Intertidal and Nearshore Zones: Benthic macroinvertebrates of the intertidal and nearshore zones within the affected area are described in USACE (2001), which includes those that inhabit soft sandy bottoms and hard rocky intertidal areas. Based on sampling by Scott and Bruce (1999), the most dominant taxa found in intertidal and nearshore zones was the small common surf-zone clam (*Donax variabilis*), the highly mobile haustorid amphipod (*Amphiporeia virginiana*), the mole crab (*Emerita talpoida*), and the mobile polychaete (*Scolelepis squamata*). Despite the disturbance of these zones from recent storm activity, no significant changes to this benthic community are expected. This is attributed to this community's highly adaptive and resilient nature because of the extreme environment that they inhabit.

Offshore Zone: Benthic macroinvertebrates of the offshore zone within the affected area are described in USACE (2001). Benthic investigations were performed by Scott and Bruce (1999) and Scott and Wirth (2000) at the proposed

offshore sand borrow sites (L1, L3, M8, and C1). The sampling also included some earlier proposed sites that were later eliminated in USACE (2001), and several outside reference sites were sampled to offer for comparison. The community composition of the offshore borrow areas and reference areas was very similar and are considered to be relatively diverse. Overall, a total of 148 taxa were identified from all of the borrow and reference areas in Scott and Bruce (1999) and 132 taxa were identified in the added sites of L1-west, L3, and M8 in Scott and Wirth (2000). The Corson Inlet Site was analyzed separately because it exhibited a distinctly different benthic community due to significant habitat differences with the other sites. The mean number of taxa per sample ranged from 20.2 (L3) to 28.85 (L1). The Corson Inlet Site had a mean number of 11.25 taxa per sample. The diversity indices, as measured by the Shannon Wiener Index and the Simpson's Dominance Index, indicated that the benthic community was relatively evenly distributed for all of the offshore sites. The diversity indices were low for the Corson Inlet Site, which is expected given that it is a high-energy environment. All of the offshore areas were dominated (over 60%) by polychaete worms. The Corson Inlet area was dominated by the bivalve, *Donax fossor*. Amphipod crustaceans also contributed substantially to the faunal composition, but to a lesser extent in the offshore areas and at the Corson Inlet area. The mean abundance of the top 10 dominant taxa of each borrow area contributed to over 80% of the mean total abundance in each of the offshore areas. Of the 27 dominant taxa (from both Scott and Bruce, 1999 and Scott and Wirth, 2000) collected from the offshore areas, twelve were polychaete taxa. Most of the dominant polychaete taxa were small, surface dwelling organisms. The small surface dwelling spionid worm *(Apoprionspio pygmaea)* and the small bristle worm (*Polygordius* spp.) were the most dominant taxa in all of the offshore areas. In contrast, the small surfzone clam (*Donax fossor*) alone contributed 72% of the mean total abundance in the Corson Inlet area (C1). For the offshore areas, Polychaetes were the highest in mean biomass ranging from 22% to 53% of the biomass among the major taxonomic groups. In the Corson Inlet area, bivalves (*Donax fossor*) were the highest in mean biomass, which represented nearly 49% of the total mean biomass. Other prominent taxa found include the polychaete, *Spiophanes bombyx*, Oligochaeta, dwarf tellin (*Tellina agilis*), surfclam (*Spisula solidissima*), a tanaid arthropod (*Tanaissus psammophilus*) and several amphipod taxa (*Ampelisca* spp., *Acanthohaustorius* spp., *Protohaustorius* cf. *deichmannae*).

Larger benthic macroinvertebrates not easily sampled in the grab samples of the 0.04 sq. M. Young sampler were obtained from commercial surfclam dredges in the same areas. The most frequently collected invertebrates included: surfclam, knobbed whelk (*Buscyon carica*), channel whelk (*Buscyon canaliculatum*), horseshoe crab (*Limulus polyphemus*), moon snail (*Polinices* sp., *Lunatia* sp.), spider crab (*Libinia emarginata*), and hermit crab (*Pagarus* sp.) (Scott and Bruce, 1999). In Scott and Wirth (2000), the surfclam and starfish

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(Echinodermata) were the most frequently sampled larger invertebrates in areas L1-west, L3, and M8.

Benthic communities can be variable seasonally or over the long-term. However, the benthic communities as described in USACE (2001) are not expected to be significantly different in the offshore sand sources. Dredging recently performed in C1 is not expected to have a significant effect on the benthic community since the predominant species inhabiting (including the surf zone clam) are highly adapted to the dynamic conditions that prevail there.

5.6 Fisheries

5.6.1 Shellfish

Shellfish resources within the project affected area were described in USACE (2001). Surfclams (*Spisula solidissima*) are the largest bivalve community found off the Atlantic coast from the Gulf of Saint Lawrence, Canada to North Carolina, and are of considerable resource value in New Jersey Atlantic Coastal waters.

The proposed sand borrow areas were investigated for juvenile and commercial adult surfclam stocks. Scott and Bruce (1999) and Scott and Wirth (2000) found that the density of juvenile surfclams within Areas L1, L3, M8 and C1were within the ranges and intermediate of densities of other borrow area studies (Brigantine and Long Beach Island) along the New Jersey Coast. A commercial surfclam survey was also performed by Scott and Bruce (1999) and Scott and Wirth (2000). Commercial densities were estimated by the number of tows and the areas of coverage of the tows. Scott and Bruce (1999) and Scott and Wirth (2000) noted that the average numbers of bushels per dredge tow was less for these sites when compared with other regional studies conducted by NJDEP along the New Jersey Coast.

Versar (2008) conducted a comprehensive analysis of surfclam data collected by NJDEP over a 19-year period from 1988 to 2006. This data shows variable densities over the years, but tended to have the higher densities north of Great Egg Harbor Inlet. From Great Egg Harbor Inlet to Townsends Inlet, the densities were overall historically low < 0.4 bushels/100m^2 (Figure 13), but did show some variability with a high density in the project area in the late 1990's (Figure 14) with a range of 1.3 to >5.7 bushels per 100m^2. The 2006 data showed a sharp decline in densities (Figure 15).

A wintering female blue crab population could exist at the mouth of the Corson Inlet, which is the location of the C1 borrow area. Between December

and March, these crabs burrow into the substrate to overwinter (Letter from NMFS dated 4/15/2013).

5.6.2 Finfish

Finfish were described in USACE (2001). The affected area is a very productive fishery for a number of important commercial and recreational finfish species. This is due to the proximity of several estuaries that provide important forage and nursery grounds. The finfish found along the Atlantic Coast of New Jersey are principally seasonal migrants. Winter is a time of low abundance and diversity as most species leave the area for warmer waters offshore and southward. During the spring, increasing numbers of fish are attracted to the New Jersey Coast, because of its proximity to several estuaries, which are utilized by these fish for spawning and nurseries.

Recreational fishing in southern New Jersey consists of scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata*), summer flounder (*Paralichtys dentatus*), weakfish (*Cynoscion regalis*), bluefish (*Pomatomus saltatrix*), red hake (*Urophycis chuss*), white hake (*Urophycis tenuis*), silver hake (*Merluccius bilinearis*), Atlantic mackerel (*Scomber scombrus*), chub mackerel (*S. japonicus*), Atlantic cod (*Gadus morhua*), northern *kingfish (Menticirrhus saxatilis*), and tautog (*Tautoga onitiss*). Northern puffer (*Sphaeroides maculatus*), spot (*Leiostomus xanthurus*), red drum (*Sciaenops ocellatus*), pollock (*Pollachius virens*), and Atlantic bonito (*Sarda sarda*) may also be taken occasionally.

Commercially important species include Atlantic menhaden (*Brevoortia tyrannus*), winter flounder (*Pseudopleuronectes americanus*), weakfish, bluefish, scup, mackerel, silver hake, red hake, summer flounder, black sea bass, butterfish (*Peprilus triacanthus*), and shad (*Alosa mediocris*). Harvesting is accomplished by use of purse seines, otter trawls, pots, and gill nets.

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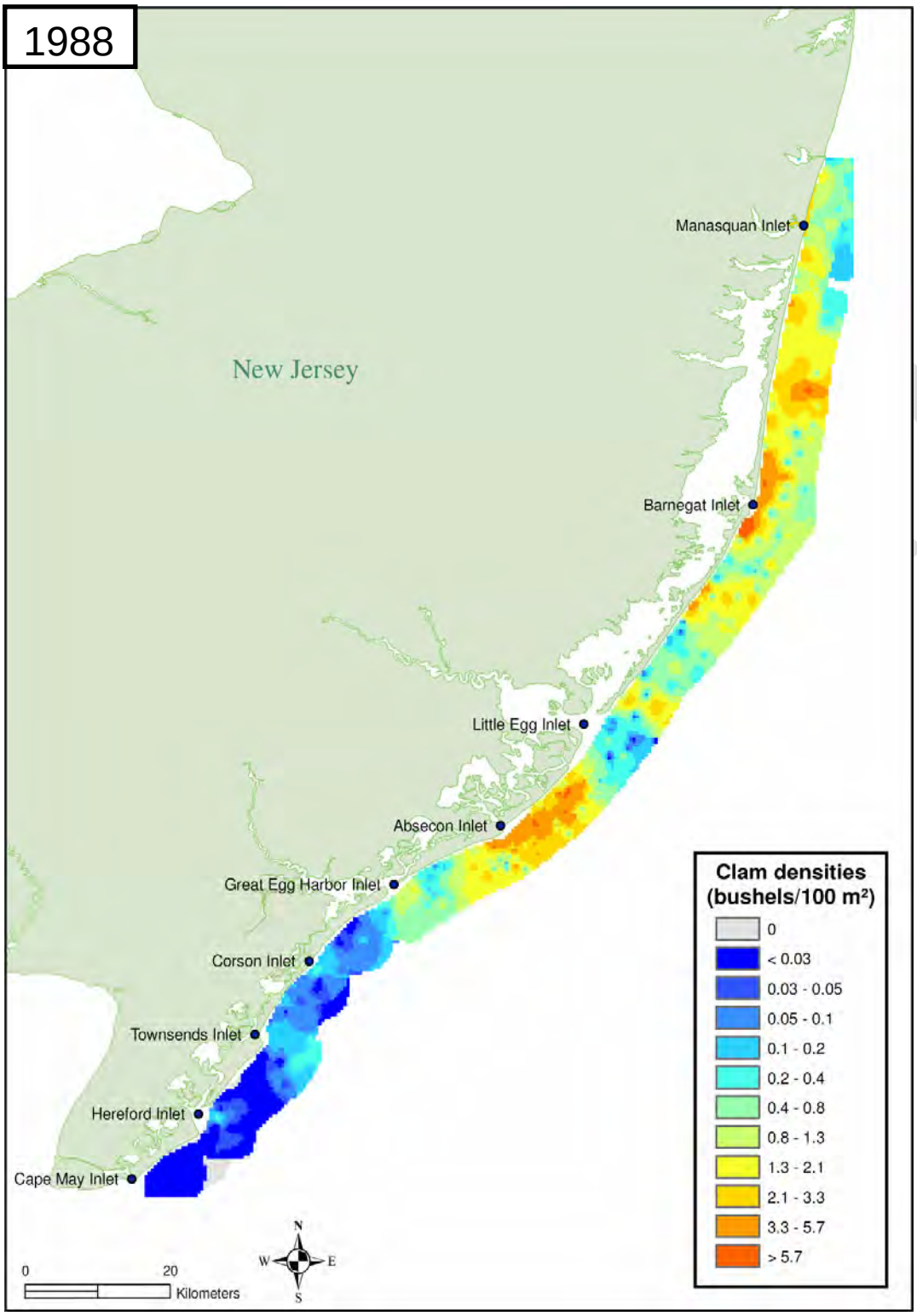

Figure 13. Surfclam densities along the NJ Coast in 1988 taken from NJDEP Survey Data (Versar, 2008)

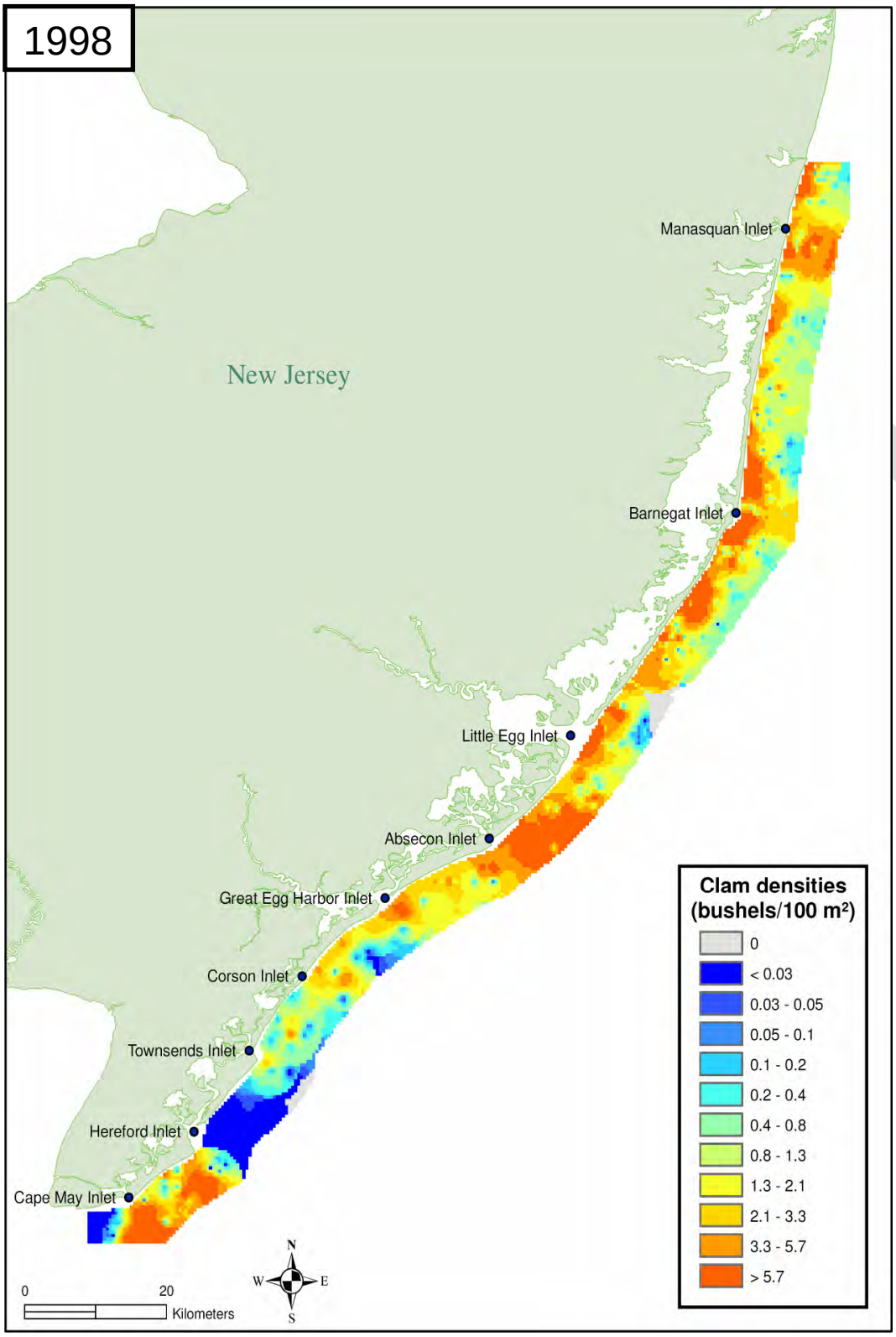

Figure 14. Surfclam densities along the NJ Coast in 1998 taken from NJDEP Survey Data (Versar, 2008)

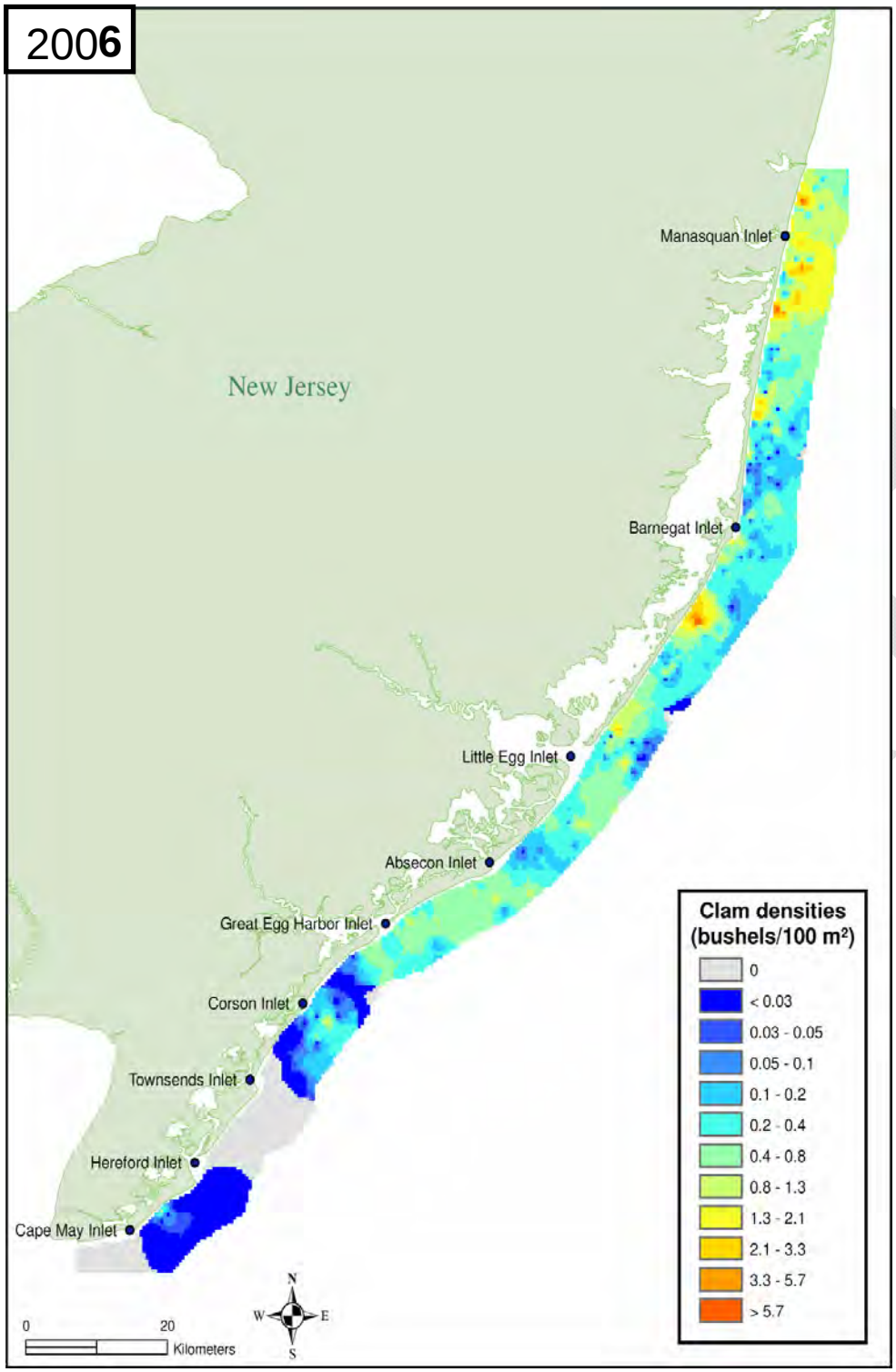

Figure 15. Surfclam Densities Along the NJ Coast in 2006 taken from NJDEP Survey Data (Versar, 2008)

Subsequent to USACE (2001), coordination was undertaken with the National Marine Fisheries Service. NMFS highlighted in a recent letter the importance of inlets such as Corson Inlet (Borrow Area C1) for fish migrating between the ocean and estuaries. Species known to utilize estuaries and inlets for access along the Atlantic Coast of New Jersey that are state and Federally managed include summer flounder (*Paralichtys dentatus*), black sea bass (*Centropristis striata*), Atlantic butterfish, striped bass (*Morone saxatilis*), bluefish, winter flounder windowpane flounder (*Scopthalmus aquosus*), tautog (*Tautoga onitiss*), weakfish, scup, white perch (*Morone americana*), spot, Atlantic croaker (*Micropogonias undulatus*) and Atlantic menhaden (Letter from NMFS dated 4/15/2013).

Diadromous species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass and American eel (*Anguilla rostrata*) transit inlets such as Corson Inlet to reach freshwater tributaries for spawning or growth to maturity. Alewife and blueback herring were designated as candidate species for listing under the Endangered Species Act (ESA) in 2011 (Letter from NMFS dated 4/15/2013). However, this designation was recently found to be not warranted at this time (www.nero.noaa.gov/stories/2013/riverherring.html website accessed on 8/8/2013).

5.6.3 Prime Fishing Areas

Several locations within or near the project area such as the “Sea Isle Lump” are classified as Prime Fishing Areas (NJAC 7:7E-3.4) by NJDEP (Figure 16). One of these features lies immediately east and partially within Borrow Area L1. An updated map in 2003 identified an area just offshore of Corson Inlet, and a portion of this area was mapped inside of the C1 Borrow Area. This borrow area (C1) was used by NJDEP in 2009 - 2011 for a beachfill project. Prime Fishing Areas include tidal water areas and water’s edge areas, which have a demonstrable history of supporting a significant local quantity of recreational or commercial fishing activity. These areas were originally delineated by Long and Figley (1984) in a publication titled “New Jersey’s Recreational and Commercial Ocean Fishing Grounds”. Since the map is over 20 years old, it was determined in 2003 that an update was needed. Charter boat, party boat and private boat captains were surveyed to identify the areas they consider recreationally significant fishing areas or prime fishing areas, and this survey data was used as a basis for the updated mapping of these areas (accessed from NJDEP website: http://www.nj.gov/dep/gis/digidownload/metadata/statewide/sportfishing.htm on 7/16/2013). Other fish habitats of value, within the study area include artificial reefs, wreck sites, groins and jetties. An artificial reef composed of tires is located approximately 7.3 kilometers (4 nautical miles) offshore from Corson Inlet, and is approximately 0.7 kilometers (0.38 nautical miles) southeast of borrow area M8.

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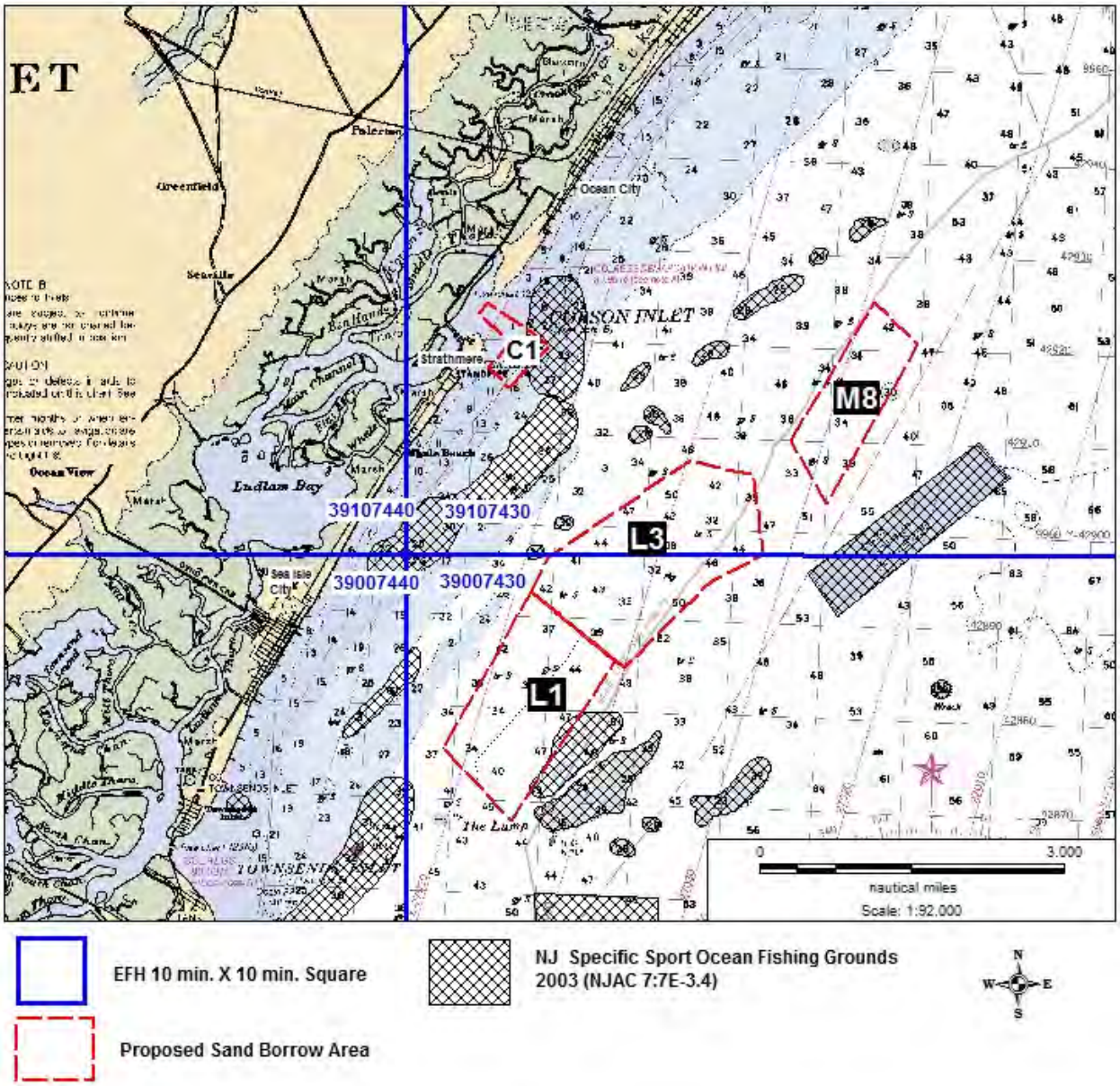

Figure 16. Prime Fishing Areas, Essential Fish Habitat Designations and Proposed Sand Borrow Areas

5.6.4 Essential Fish Habitat

Under provisions of the reauthorized Magnuson-Stevens Fishery Conservation and Management Act of 1996, the entire study area including the borrow areas, nearshore and intertidal areas were designated as Essential Fish Habitat (EFH) for species with Fishery Management Plans (FMP's), and their important prey species. The National Marine Fisheries Service has identified EFH within 10 minute X 10 minute squares (Figure 16). The study area contains EFH for various life stages for 26 species of managed fish and shellfish. Table 5 presents the managed species and their life

stage that EFH is identified for within the 10 x 10 minute squares that cover the study area. These squares are within the seawater biosalinity zone (NOAA, 1999). The habitat requirements for identified EFH species and their representative life stages are provided in Table 6. USACE (2001) provided an evaluation of EFH in the project area. Recent correspondence with NMFS identified a need to re-evaluate EFH. To provide a complete evaluation, information from USACE (2001) is included, and any new information is presented as appropriate.

A review of EFH designations and the corresponding 10 x 10 minute squares, which encompasss portions of the project, are to be designated as "Habitat Areas of Particular Concern" (HAPC) for the sandbar shark. HAPC are areas of EFH that are judged to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation (NOAA, 1999). Although not formally listed as a HAPC, offshore shoal areas, also called "lumps" are sandy areas in the offshore zone that are generally 10 meters (30 feet) or less in depth surrounded by deeper, flatter areas. These areas are believed to attract higher numbers of finfish species and are frequently targeted by recreational fishermen. It is believed that these lumps provide some bottom structure as well as a hydrodynamic environment attractive to resident or migratory fish and/or their prey.

Table 5. Summary of Species with EFH Designations in the 10 Min. X 10 Min. Squares of 39007440, 39007430, 39107440, 39107430 (Guide to Essential Fish Habitat Designations accessed on 7/16/2013 at http://www.nero.noaa.gov/hcd/index2a.htm).

Managed Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*				(39007440), (39007430) (39107440) (39107430)
Whiting (*Merluccius bilinearis)*	(39007440)	(39007440)	(39007440)	
Red hake *(Urophycis chuss)*	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	
Redfish (*Sebastes fasciatus*)	(n/a 39107440)			
Winter flounder (*Pleuronectes americanus*)	(39007440) (39107430)	(39007440) (39107430)	(39007440) (39107430)	(39007440) (39107430)
Windowpane flounder *(Scopthalmus aquosus)*	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430) (39107430)
Atlantic sea herring *(Clupea harengus)*			(39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Monkfish *(Lophius americanus)*	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)		
Bluefish *(Pomatomus saltatrix)*			(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)

Managed Species	Eggs	Larvae	Juveniles	Adults
Long finned squid *(Loligo pealei)*	n/a	n/a	(39007430)	
Short finned squid *(Illex ilecebrosus)*	n/a	n/a		
Atlantic butterfish *(Peprilus tricanthus)*			(39007440) (39107440) (39107430)	
Summer flounder *(Paralicthys dentatus)*		(39007440) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Scup *(Stenotomus chrysops)*	n/a	n/a	(39007440) (39007430) (39107440) (39107430)	52, 53, 63, 64 (39007440) (39007430) (39107440)
Black sea bass *(Centropristus striata)*	n/a		(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Surfclam *(Spisula solidissima)*	n/a	n/a	(39007430) (39107440) (39107430)	(39007430) (39107440) (39107430)
Ocean quahog *(Artica islandica)*	n/a	n/a		
Spiny dogfish *(Squalus acanthias)*	n/a	n/a		
King mackerel *(Scomberomorus cavalla)*	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Spanish mackerel *(Scomberomorus maculatus)*	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Cobia *(Rachycentron canadum)*	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Sand tiger shark *(Odontaspis taurus)*		(39007440) (39007430) (39107440) (39107430)		(39007440) (39007430) (39107440)
Atlantic angel shark *(Squatina dumerili)*		(39007440) (39007430)	(39007440) (39007430)	(39007440) (39007430)
Dusky shark *(Charcharinus obscurus)*		(39107440) (39107430)		
Sandbar shark *(Charcharinus plumbeus)*		[HAPC (39107440), (39107430)] (39007440) (39007430)	[HAPC (39107440), (39107430)] (39007440) (39007430)	[HAPC (39107440), (39107430)] (39007440) (39007430)
Tiger shark *(Galeocerdo cuvieri)*		(39007440) (39007430) (39107430)		
Atl. Sharpnose shark *(Rhizopriondon terraenovae)*				(39007440)
Clearnose skate (Raja eglanteria)			(39007440) (39007430) (39107440) (39107430)	(39007440) (39007430) (39107440) (39107430)
Little skate (Raja erinacea)			(39007440) (39007430) (39107440) (39107430)	
Winter skate (Raja ocellata)			(39007440) (39007430) (39107440) (39107430)	
Note: Square numbers represent the latitude/longitude coordinates of the southeast corner of each 10 minute quadrangle.				

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Managed Species	Eggs	Larvae	Juveniles	Adults
39007440: The waters within the Atlantic Ocean within the square within the New Jersey Inland Bay estuary affecting from Sea Isle City, N.J. on the northeast corner, southwest to N. Wildwood, N.J., just south of Hereford Inlet . These waters affect the following within this square as well: Ludlam Thorofare, Townsend Sound, Mill Thorofare, Middle Thorofare, Mill Creek, Stites Sound, North Channel, Swainton, N.J., Townsends Inlet, South Channel, Ingram Thorofare, Graven Thorofare, Long Reach, Great Sound, Gull I., Gull I. Thorofare, Crease Thorofare, Scotch Bonnet, Nichols Channel, Avalon, N.J., Seven Mile Beach, Stone Harbor, N.J., Great Channel, Nummy I., Grassy Sound Channel, Old Turtle Thorofare, Grassy Sound, Beach Creek, Hereford Inlet, Dung Thorofare, Drum Thorofare, Jenkins Sound, Mayville, N.J., Shelled Ledge, Jenkins Channel, and N. Wildwood N.J. **39007430:** The waters within the Atlantic Ocean within the square one square east of the square affecting Townsends Inlet, Stone Harbor, NJ., and Hereford Inlet. These waters also affect the following within this square: Avalon Shoal and The Lump. **39107440:** The waters within the square within the Atlantic Ocean within the New Jersey Inland Bay estuary within Ludlow Bay affecting south of Whale Beach, and north of Sea Isle City, N.J. These waters also affect the following: Whale Creek, Main Channel, Flat Creek, Ben Hands Thorofare, and the surrounding marsh. **39107430:** The waters within the square within the Atlantic Ocean and within the New Jersey Inland Bay estuary affecting the following: south of Margate City, N. J. and south and east of Ocean City, N.J. and Peck Beach, within Great Egg Harbor Bay and Peck Bay. The following features are also affected by these waters: Risley Channel, Lone Cedar I., Broad Thorofare, Anchorage Pt., Rainbow Is., Somers Pt., Cowpens I., Shooting I., Golders Pt., and Beesleys Pt. These waters extend up into Great Egg Harbor Bay to the boundary of the mixing / seawater salinity zones, which extends from just west of Somers Pt., southwest across the Bay to east of the entrance to the Tuckahoe River. These waters also affect southwest of Peck Beach, along with Crook Horn Creek, Blackmon I., Devils I., Corson Inlet, Strathmore, N. J., Whale Beach, N. J., and Middle Thorofare.				

Table 6. Habitat Utilization of Identified EFH Species and their Summary of Species with EFH Designation in the 10 Min. X 10 Min. Squares (NOAA, 1999)

Managed Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)* (Fahay, 1998)				**Habitat:** Bottom (rocks, pebbles, or gravel) winter for Mid-Atlantic **Prey:** shellfish, crabs, and other crustaceans (amphipods) and polychaetes, squid and fish (capelin redfish, herring, plaice, haddock).
Whiting (*Merluccius bilinearis*) (Morse et al. 1998)	**Habitat:** Pelagic continental shelf waters in preferred depths from 50-150 m.	**Habitat:** Pelagic continental shelf waters in preferred depths from 50-130 m. (Morse et al. 1998)	**Habitat:** Bottom (silt-sand) nearshore waters in preferred depths from 150-270 m in spring and 25-75 m in fall. **Prey:** fish, crustaceans (euphasids, shrimp), and squids (Morse et al. 1998)	
Winter flounder (*Pseudopleuronectes americanus)* (NOAA, 1999); Pereira et al, 1998; McClane, 1978)	**Habitat:** Mud to sand or gravel; from Jan to May with peak from	**Habitat:** Planktonic, then bottom oriented in fine sand or	**Habitat:** Shallow water. Winter in estuaries and outer continental	**Habitat:** 1-30 m inshore; less than 100m offshore; mud,

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Managed Species	Eggs	Larvae	Juveniles	Adults
	Mar to April in 0.3 to 4.5 meters inshore; 90 meters or less on Georges Bank. 10 to 32 ppt salinity.	gravel, 1 to 4.5 m inshore. 3,2 to 30 ppt. salinity. **Prey:**nauplii, harpacticoids, calanoids, polychaetes, invertebrate eggs, phytoplankton.	shelf. Equally abundant on mud or sand shell. **Prey:** copepods, harpacticoids, amphipods, polychaetes	sand, cobble, rocks, boulders. **Prey:** omnivorous, polychaetes and crustaceans.
Red hake *(Urophycis chuss)* (Steimle et al. 1998)	**Habitat:** Surface waters, May – Nov.	**Habitat:** Surface waters, May –Dec. Abundant in mid- and outer continental shelf of Mid-Atl. Bight. **Prey:** copepods and other microcrustacean s under floating eelgrass or algae.	**Habitat:** Pelagic at 25-30 mm and bottom at 35-40 mm. Young inhabit depressions on open seabed. Older juveniles inhabit shelter provided by shells and shell fragments. **Prey:** small benthic and pelagic crustaceans (decapod shrimp, crabs, mysids, euphasiids, and amphipods) and polychaetes).	
Windowpane flounder *(Scopthalmus aquosus)* (Chang, 1998)	**Habitat:** Surface waters <70 m, Feb-July; Sept-Nov.	**Habitat:** Initially in pelagic waters, then bottom <70m,. May-July and Oct-Nov. **Prey:** copepods and other zooplankton	**Habitat:** Bottom (fine sands) 5-125m in depth, in nearshore bays and estuaries less than 75 m **Prey**: small crustaceans (mysids and decapod shrimp) polychaetes and various fish larvae	**Habitat:** Bottom (fine sands), peak spawning in May , in nearshore bays and estuaries less than 75 m **Prey**: small crustaceans (mysids and decapod shrimp) polychaetes and various fish larvae
Atlantic sea herring *(Clupea harengus)* (Reid et al., 1998)			**Habitat:** Pelagic waters and bottom, < 10 C and 15-130 m depths **Prey:** zooplankton (copepods, decapod larvae, cirriped larvae, cladocerans, and pelecypod larvae)	**Habitat:** Pelagic waters and bottom habitats; **Prey:** chaetognath, euphausiids, pteropods and copepods.
Monkfish *(Lophius americanus)* (Steimle et al., 1998)	**Habitat:** Surface waters, Mar. – Sept. peak in June in upper water column of inner to mid Continental shelf	**Habitat:** Pelagic waters in depths of 15 – 1000 m along mid-shelf also found in surf zone **Prey:** zooplankton		

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Managed Species	Eggs	Larvae	Juveniles	Adults
		(copepods, crustacean larvae, chaetognaths)		
Bluefish *(Pomatomus saltatrix)*			**Habitat:** Pelagic waters of continental shelf and in Mid-Atlantic estuaries from May-Oct. **Prey:** squids, smaller fish	**Habitat:** Pelagic waters; found in Mid-Atlantic estuaries April – Oct. **Prey:** squids, smaller fish
Long finned squid *(Loligo pealei)*	n/a	**Habitat:** EFH for Pre-recruits is pelagic waters over the Continental Shelf		
Short finned squid *(Illex ilecebrosus)*	n/a	**Habitat:** EFH for Pre-recruits is pelagic waters over the Continental Shelf		
Atlantic butterfish *(Peprilus tricanthus)*	**Habitat:** Pelagic waters		**Habitat:** Pelagic waters in 10 – 360 m	**Habitat:** Pelagic waters **Prey:** jellyfish, crustaceans, worms, and small fishes
Summer flounder *(Paralicthys dentatus)*		**Habitat:** Pelagic waters, nearshore at depths of 10 – 70 m from Nov. – May	**Habitat:** Demersal waters (mud and sandy substrates)	**Habitat:** Demersal waters (mud and sandy substrates). Shallow coastal areas in warm months, offshore in cold months
Scup *(Stenotomus chrysops)*	n/a	n/a	**Habitat:** Demersal waters	**Habitat:** Demersal waters offshore from Nov – April
Black sea bass *(Centropristus striata)*	n/a		**Habitat:** Demersal waters over rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas	**Habitat:** Demersal waters over structured habitats (natural and man-made), and sand and shell areas
Surfclam *(Spisula solidissima)*	n/a	n/a	**Habitat:** Throughout bottom sandy substrate to 3' in depth from beach zone to 60 m.	
Ocean quahog *(Artica islandica)*	n/a	n/a		
Spiny dogfish *(Squalus acanthias)*	n/a	n/a		
King mackerel *(Scomberomorus cavalla)*	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island

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Managed Species	Eggs	Larvae	Juveniles	Adults
	ocean-side waters from the surf to the shelf break zone.	ocean-side waters from the surf to the shelf break zone. **Prey:** zooplankton and fish eggs	ocean-side waters from the surf to the shelf break zone **Prey:** zoo-plankton, shrimps, crab larvae, squids, herrings, silversides, and lances.	ocean-side waters from the surf to the shelf break zone **Prey:** squids, herrings, silversides, and lances.
Spanish mackerel *(Scomberomorus maculatus)*	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** zooplankton and fish eggs	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** zoo-plankton, shrimps, crab larvae, squids, herrings, silversides, and lances.	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** squids, herrings, silversides, and lances
Cobia *(Rachycentron canadum)*	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** crabs, shrimps, and small fishes	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** crabs, shrimps, and small fishes
Sand tiger shark *(Odontaspis taurus)*		**Habitat:** Shallow coastal waters, bottom or demersal		**Habitat:** Shallow coastal waters, bottom or demersal **Prey:** small fishies (including mackerels, menhaden, flounders, skates, sea trouts, and porgies), crabs and squids.
Atlantic angel shark *(Squatina dumerili)*		**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters, bottom (sand or mud near reefs)
Dusky shark *(Charcharinus obscurus)*		**Habitat:** Shallow coastal waters		
Sandbar shark *(Charcharinus plumbeus)*		**Habitat:** Shallow coastal waters	**Habitat:** Coastal and pelagic	**Habitat:** Shallow coastal waters

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Managed Species	Eggs	Larvae	Juveniles	Adults
		HAPC is identified for pupping areas.	waters HAPC is identified for pupping areas.	HAPC is identified for pupping areas.
Scalloped hammerhead shark *(Sphyrna lewini)*			**Habitat:** Shallow coastal waters	
Tiger shark *(Galeocerdo cuvieri)*		**Habitat:** Shallow coastal waters		
Atl. Sharpnose shark *(Rhizopriondon terraenovae)*				**Habitat:** Shallow coastal waters
Clearnose skate (*Raja eglanteria*)			**Habitat:** Shallow soft bottoms or rocky, gravelly bottoms.	**Habitat:** Shallow shores moves to deeper water in winter.
Little skate (*Raja erinacea*)			**Habitat:** Shallow coastal water over sand or gravel to 80 fathoms **Prey:** Crustaceans, clams, squids and worms	
Winter skate (*Raja ocellata*)			**Habitat:** Shallow coastal water over sand or gravel to 80 fathoms **Prey:** Crustaceans, clams, squids and worms	

5.7 Wildlife

5.7.1 Birds

USACE (2001) provides a discussion of all of the avifauna within the affected areas. The beaches throughout the study area along with any associated dunes are nesting grounds for the Federally threatened, state endangered piping plover (*Charadrius melodus*), large colonies of State threatened least tern (*Sterna dougallii*), common tern (*Sterna hirundo*), and black skimmer (*Rynchops niger*), with occasional use by spotted sandpiper (*Actitis macularia*) and gull-billed tern (*Gelochelidon nilotica*). The State's Non-game and Endangered Species Program monitors the occurrence of black skimmer, piping plover, and least tern within the study area. According to recent surveys there are prime nesting areas on southern sections of Peck Beach Island, in Corson's Inlet State Park near Corson Inlet, and at the northern extent of Ludlam Island in Strathmere, north of Whale Beach (per. comm. Dave Jenkins, NJDEP). The largest recorded colony of black skimmer in this area occurs in the Strathmere Natural Area at Corson Inlet. On the outer coastal plain behind Ludlam Island, salt marsh complexes and patches of forest along the mainland edge support nesting and feeding activity for migrating neotropical passerines, and other birds along the Atlantic flyway.

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The following transient species may use dune and intertidal beach habitats on Peck Beach during their spring and winter migrations: ruddy turnstone (*Arenaria interpres*), northern horned lark (*Octocoris alpestris*), snowy owl (*Nyctia sandvicensis*), and brown pelican (*Pelecanus occidentalis*). Several gull species also breed in the intertidal zone such as, herring gull (*Larus argentatus*), great black-backed gull (*Larus marinus*), and laughing gull (*Larus atricilla*).

Several species of gulls are common along New Jersey's shores, and are attracted to forage on components of the beach wrack such as carrion and plant parts. These gulls include the laughing gull (*Larus atricilla*), herring gull (*L. argentatus*), and ring-billed gull (*L. delawarensis*).

The beaches and upper dune areas may be inhabited by a number of non-marine birds such as the savannah sparrow (*Passerculus sandwichensis*), song sparrow (*Melospiza melodia*), mourning dove (*Zenaida macroura*), gray catbird (*Dumetella carolinensis*), northern mockingbird (*Mimus polyglottos*), and brown thrasher (*Toxostoma rufum*). Other birds common to the area include boat-tailed grackle (*Quiscalus major*), sharp-tailed sparrow (*Ammodramus caudacutus*), seaside sparrow (*A. maritimus*), eastern kingbird (*Tyrannus tyrannus*), tree swallow (*Tachycineta bicolor*), northern bobwhite (*Colinus virginianus*) and red-winged blackbird.

Significant erosion of primary dune and upper beach habitats was experienced on Peck Beach including the complete loss of dunes in Southern Ocean City and within Corson's Inlet State Park. Recently, the NJDEP – Division of Fish and Wildlife and the Conserve Wildlife Foundation of New Jersey conducted a post storm assessment after Hurricane Sandy for beach nesting and migratory birds at a number of locations along the New Jersey coast including the Strathmere Natural Area and Townsends Inlet. Beach nesting bird habitat was noted as severely eroded in these locales, but the impact on beach nesters is less certain. The losses of sand could reduce the quantity of habitat, but the washover areas especially in areas that previously had thick vegetation would be an improvement of habitat.

5.7.2 Mammals, Reptiles and Amphibians

Terrestrial mammalian species are more likely to be found in the more upland habitats along the ocean coast. Several species of mammals are associated with dune habitats such as the raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), red fox (*Vulpes fulva*), white-footed mouse (*Peromyscus leucopus*), meadow vole (*Microtus pensylvanicus*), and white-tailed deer (*Odocoileus virginianus*).

Twenty-one non-marine mammal species are known or expected to occur on Peck Beach. Of these, New Jersey considers two species to be threatened (Keen's myotis and the small footed myotis), and one is of undetermined status (rice rat). The rice rat, once found along coastal areas, has not been seen there for approximately 30 years. Thirteen of the 21 species (59%) are known to utilize tidal marshes. Twelve

species are believed to utilize strand thickets, 9 kinds occur in urban areas, 7 utilize meadow, 5 occur in dune areas, and 4 inhabit reed grasslands.

Common reptilian and amphibian species associated with dune habitats may include Fowler's toad (*Bufo woodhousei fowleri*), eastern hognose snake (*Heterodon platyrhinos*), and box turtle (*Terrapene carolina*). Tidal marsh and adjacent upland dunes of the inland bays system are important habitats for feeding and nesting of the diamondback terrapin (*Malaclemys terrapin terrapin*).

Significant erosion of primary dune and upper beach habitats was experienced on Peck Beach including the complete loss of dunes in Southern Ocean City and within Corson's Inlet State Park.

As discussed in USACE (2001), a number of marine mammals are commonly observed in New Jersey Atlantic coastal waters. Cetaceans (whales and dolphins) may be present within the affected area. Some of the taxa likely to be seen in the project area include: bottlenose dolphin (*Tursiops turncatus*), common dolphin (*Delphinus delphis*), common porpoise (*Phocoena phocoena*), short-finned pilot whale (*Globiocephala sieboldii macrorhyncus*) and fin whale (*Balaenoptera physalus*). The project area is within the range of the harbor seal (Phoca vitulina), which may be seen in the vicinity on an occasional basis.

Several sea turtle species may be present in New Jersey Coastal waters on an occasional basis. These include the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), Kemp's ridley turtle (*Lepidochelys kempii*) and leatherback turtle (*Dermochelys coriacea*), which are all listed as Federally threatened and endangered.

5.8 Rare, Threatened and Endangered Species

The Federally listed (threatened) and state listed (endangered) piping plover (*Charadrius melodus*) has nested historically within several areas of the study area, including the northern portion of Peck Beach near Great Egg Harbor Inlet, the middle portion of Peck Beach, and nearly the entire length of Ludlam Beach to its southernmost point at Townsends Inlet (USFWS, 1999). More recently, nesting pairs have shown a general decline from mid-Ocean City to Townsends Inlet between 2002 and 2012 (Table 7).

The candidate species, red knot (*Calidris canutus rufa*,) can be found in lower densities during the spring and fall migrations along Atlantic Coast beaches, and could occur within the project area. In wintering and migration habitats, red knots may forage on bivalves, gastropods, and crustaceans (USFWS 2013; Harrington 2001).

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Table 7. Number of Pairs of Piping Plovers Within or Near Project Area Nesting Sites 2003-2012. (Source: NJDEP, 2012)

Location	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Ocean City - Center	8	8	5	7	4	3	1	0	1	0
Corson's Inlet State Park	2	3	2	2	2	1	2	0	0	0
Strathmere NA	0	0	1	1	0	0	0	1*	1	1
Strathmere (Upper Twp)	1	1	1	0	0	0	0	1*	2	2
Townsends Inlet	1	1	1	0	0	0	0	0	0	0

The seabeach amaranth (*Amaranthus pumilus*) is a Federally listed threatened plant. The seabeach amaranth is an annual plant, endemic to Atlantic coastal plain beaches, and primarily occurs on overwash flats at the accreting ends of barrier beach islands and lower foredunes of non-eroding beaches. The species occasionally establishes small temporary populations in other areas, including bayside beaches, blowouts in foredunes, and sand and shell material placed as beachfill. Since 2001, populations have been found in Ocean City, Corson's Inlet State Park (North and South), Upper Township (Strathmere), and Sea Isle City. However, in the last five years, only Ocean City and Sea Isle City had populations of seabeach amaranth. For 2012, Ocean City accounted for the highest numbers in all size class distributions in the state of New Jersey (USFWS, 2013).

The Corson's Inlet State Park (including the Strathmere Natural Area), and the beaches in Upper Township – Strathmere and Whale Beach are designated as Natural Heritage Priority Sites in the State of New Jersey. This designation was created to identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities (information accessed from internet website on 8/20/2013 http://www.state.nj.us/dep/gis/digidownload/metadata/statewide/prisites.htm).

The New Jersey coast may be visited by five species of threatened and endangered sea turtles. These turtles include the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), Kemp's ridley turtle (*Lepidochelys kempii*) and leatherback turtle (*Dermochelys coriacea*).

Six species of endangered whales may occasionally be encountered in nearshore waters within the study area during their migrations. These include sperm whale (*Physeter catodon*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), blue whale (*Balaenoptera musculus*), sei whale (*Balaenoptera borealis*) and black right whale (*Balaena glacialis*). Within the proposed offshore borrow areas, North Atlantic right whales are likely to occur primarily during the months of November through April. Humpback whales feed during the spring, summer,

and fall over a range that encompasses the eastern coast of the U.S., while fin whales may be present off the coast of New Jersey year round (letter from NMFS dated 4/14/2013).

The New York Bight population of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) was recently listed as endangered by the NMFS. Atlantic sturgeon are anadromous, spending a majority of their adult life phase in marine waters, migrating up rivers to spawn in freshwater then migrating to brackish water in juvenile growth phases. The Atlantic sturgeon are known to spawn within the Delaware River and migrate along the coast of New Jersey, although the extent of the use of marine habitat by Atlantic sturgeon is not fully known. This species could be present within the project impact area. Studies have indicated that depth distribution appears seasonal, with sturgeon inhabiting the deepest waters during the winter and the shallowest during summer and early fall.

Two rare plant species have historically inhabited the Strathmere Natural Area: the seabeach evening primrose (*Oenothera humifusa*) and seaside sandwort (*Honckenya peploides*). Prior to the 2009 beachfil project at Strathmere, most of the suitable habitat for these species was non-existent in this area due to erosion.

5.9 Reserves, Preserves, Parks and Public Land

USACE (2001) discussed that the State of New Jersey manages two areas along the ocean coast within the project area. Both of these areas are part of the Corson's Inlet State Park on both sides of Corson Inlet. On the north side of the inlet is Corson's Inlet State Park, and the south side is the Strathmere Natural Area, which is part of Corson's Inlet State Park. The Strathmere Natural Area and Corson's Inlet State Park are important areas for nesting birds such as the Federally threatened and State endangered piping plover, and nesting colonies of black skimmers and least terns, one of the largest colonies in the state. Both areas are under the management of the New Jersey Division of Parks and Forestry; however, management of colonial nesting birds and shorebirds is conducted by the NJ Division of Fish and Wildlife. These areas are accessible to the public for recreation activities; however, restrictions may be in place during the bird-nesting season.

USACE (2001) also discussed that there is one area identified within the project area that is designated as an "Otherwise Protected Area (OPA)" under the Coastal Barrier Resources Act (CBRA). This area is identified as "NJ-08P", and is located on both sides of Corson Inlet. OPAs are undeveloped coastal barriers that are within the boundaries of an area established under Federal, State, or local law, or held by a qualified organization, primarily for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes. This area covers Corson's Inlet State Park, which includes the Strathmere Natural Area.

Since 2001, significant changes have occurred to the shorelines of Corson's Inlet State Park. Erosion was severe within the Strathmere Natural Area where little of the

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beach and dunes that were present prior to 2001 were lost by 2008. This prompted a State of New Jersey beachfill project in 2009 where over 203,000 cubic yards of sand were pumped to re-create the beach and dune system of the Strathmere Natural Area. The beachfill sand was obtained from the Corson Inlet borrow area (C1). Although the Strathmere Natural Area sustained significant erosion from Hurricane Sandy, the overall beach berm and dune constructed in 2009 remained intact. The north shoreline of Corson's Inlet State Park suffered substantial dune loss. The Coastal Research Center (2013) reported that storms between 2009 and 2011 increased rates of beach and dune losses. The beach had been narrow with spring high tides reaching the near-vertical scarp in the dunes. The slow rate of retreat that this area was experiencing was largely accelerated during Hurricane Sandy.

5.10 Noise

USACE (2001) discussed noise in the affected area and determined that noise is of environmental concern because it can cause annoyance and adverse health effects to humans and animal life. Noise can impact such activities as conversing, reading, recreation, listening to music, working, and sleeping. Wildlife behaviors can be disrupted by noises also, which can disrupt feeding and nesting activities. Because of the developed nature of Ocean City and Sea Isle City, noises are common and can come in the form of restaurant and entertainment facilities, automobiles, boats, and recreational visitors. However, these communities impose local restrictive noise ordinances to minimize noise.

5.11 Cultural Resources

Several terrestrial and marine cultural resource investigations were conducted by the USACE, in consultation with the NJSHPO and other interested parties for the Great Egg Harbor Inlet to Townsends inlet project to fulfill Section 106 responsibilities under the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR Part 800. Those investigations were discussed in the initial NEPA document dated September 2001, and are cited in the References Section of this document.

Based on the results of the previous cultural resource investigations a total of 5 potentially significant cultural anomalies are within the limits of project construction; three tidal zone anomalies (Anomaly I in Sea Isle City and Anomalies II and III in Ocean City) and two sonar targets (Target 21:82 located within borrow area C-1, and Target 45:63 also located in borrow area C-1).

The USACE also plans to use a recently permitted borrow area expansion called C1-Expansion. A cultural resource investigation was conducted by NJDEP in order to satisfy Section 106 and 33 CFR 325 Appendix C requirements for a Department of Army Permit. The permit area encompassed a 46 acre borrow area located along the northern boundary of the previously surveyed C1 borrow area. The findings of the

investigation can be found in the report titled, *Phase I Underwater Archaeological Survey of Corsons Inlet Borrow Area C1 Expansion, Township of Upper, Cape May County* prepared by Dolan Research and dated May 2009. None of the anomalies located during the investigation generated signatures suggestive of submerged cultural resources and no additional investigations are recommended. However, based on "subsequent" information from the NJSHPO and local collectors, the beach nourishment activity "conducted by NJDEP in 2011" was monitored by a professional archaeologist.

5.12 Hazardous, Toxic and Radioactive Wastes (HTRW)

Hazardous, Toxic and Radioactive Wastes (HTRW) include any hazardous substance regulated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Hazardous substances regulated under CERCLA include "hazardous wastes" under the Resource Conservation and Recovery Act (RCRA), "hazardous substances" identified under Section 311, of the Clean Air Act (CAA), "toxic pollutants" designated under Section 307 of the Clean Water Act (CWA), "hazardous air pollutants" designated under Section 112 of the CAA, and eminently hazardous chemical substances or mixtures that EPA has taken action under Section 7 of the Toxic Substances Control Act (TSCA), but does not include petroleum, unless already included in the above categories, or natural gas.

In accordance with the HTRW Guidance for Civil Work Projects, ER 1165-2-132, dated June 26, 1992, a literature survey was conducted for the Great Egg Harbor Inlet to Townsends Inlet study project area, and was discussed in USACE (2001).

In this document, the following conclusions were made:

- The project area has been primarily a residential area and most contamination could be attributed to non-point sources (parking lots, roadways, etc) and commercial activities (leaking underground storage tanks, waste generation/discharge). The storm water outfalls in the project area are a source of possible contamination, however since the area drained is residential, the severity of the contamination is low and will not pose a concern to the project.

- The proposed project will not worsen HTRW conditions in the project area. "With" Project and "Without" Project HTRW conditions are essentially the same.

- The sites listed in USACE (2001) are outside the project area. These sites all have either soil or groundwater HTRW issues and since they are outside of the project area only groundwater is of concern. The current plan does not include any type of onshore excavation where groundwater could be encountered. However, if the plan is changed there may need to be a reevaluation of the HTRW sites of concern for impacts.

- The potential offshore borrow areas identified for this study where analyzed for possible HTRW impacts. All of the HTRW sites listed can be eliminated as possible sources of contamination for the potential borrow areas because of their distance offshore. Sediment sampling within the borrow area areas did not identify any contaminants of concern (Versar, 2004).

- The U.S. Army Corps of Engineers Philadelphia District performed a search using the Project Information Retrieval System (PIRS) for Formerly Used Defense Sites (FUDS) within the project boundaries. There were no sites identified in the project area or the potential borrow area locations. However, subsequent to USACE (2001), the Philadelphia District and NJDEP utilizes screening on all dredges and dredge outfall pipes to minimize the potential for depositing munitions and explosives of concern (MECs) onto beaches receiving beachfill from offshore sand sources.

6.0 ENVIRONMENTAL IMPACTS

USACE (2001) provided a comprehensive discussion on the direct, indirect and cumulative effects of the selected plan. A comparative impact analysis of the alternatives considered was also provided in this document and is incorporated by reference. Table 8 provides a review of the affected environmental resources, and if any significant changes in the project or project area require additional discussion. Resource topics with impacts that do not require further discussion are incorporated by reference (USACE, 2001). Resources that require further discussion are presented as indicated in Table 8.

Table 8. Potential Impacts to Affected Resources

Impact Category	Incorporate By Reference	Impacts of Changes since USACE (2001)	Section
Mineral Resources	USACE (2001)	Reduction in initial construction quantities and periodic nourishment quantities results in approximately 10 million cubic yards less than 2001 estimate for 50-yr project. Areas M8 and a portion of L3 require approval from BOEM for periodic nourishment.	6.1
Air Quality	USACE (2001)	A conformity analysis was conducted for this EA. NOx emissions exceed yearly threshold of 100 tons/yr. for marginal non-attainment ozone areas. A NOx reduction plan will be required and implemented prior to construction.	6.2
Water and Sediment Quality	USACE (2001)	Contaminants analysis screening was performed on sand borrow area sediments in 2004. No significant contamination identified. No	6.3

Table 8. Potential Impacts to Affected Resources			
Impact Category	**Incorporate By Reference**	**Impacts of Changes since USACE (2001)**	**Section**
		significant changes in impacts from project changes discussed in Section 4.2.	
Dune and Upper Beach Habitat	USACE (2001)	Dune and upper beach habitats experienced significant erosion from recent storms. Project would restore these habitats and provide more stability.	6.4.
Benthos (offshore)	USACE (2001)	Use of L3 for all beaches in initial construction will impact more area of L3 initially, but overall impact areas in borrow areas will be reduced due to reduction in quantities of sand needed.	6.5
Shellfish	USACE (2001)	No significant changes in impacts from project changes discussed in Section 4.2. Reduction in sand quantities required will reduce impacts to surfclam habitat. Impacts to wintering blue crabs in C1 may be unavoidable if winter dredging window is not possible.	6.6.1
Finfish	USACE (2001)	No significant changes in impacts from project changes discussed in Section 4.2. Dredging in C1 is not expected to impede migration of fish through Corson Inlet.	6.6.2
Prime Fishing Areas	USACE (2001)	Prime Fishing Areas (PFA) as identified in NJAC 7:7E-3.4 have been updated since 2001. A 72-acre portion of C1 is now designated as a PFA. C1 was recently dredged by NJDEP in 2009. Impacts to PFA not expected to be significant based on dynamic inlet environment.	6.6.3
Essential Fish Habitat	USACE (2001)	NMFS requested an updated EFH assessment. New species were updated to EFH list. Impacts on EFH including project changes not considered significant.	6.6.4
Birds	USACE (2001)	Some upper beach and primary dune habitats damaged by storms. Loss of nesting habitat in severely eroded areas, but enhancement of habitat in overwash area for beach nesting	6.7.1

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Table 8. Potential Impacts to Affected Resources			
Impact Category	**Incorporate By Reference**	**Impacts of Changes since USACE (2001)**	**Section**
		birds. Project would benefit terrestrial-oriented birds by providing more stable habitat.	
Mammals, Reptiles and Amphibians	USACE (2001)	Some upper beach and primary dune habitats damaged by storms. Project would benefit terrestrial-oriented species. Effects of noise on marine mammals discussed in Section 6.10.	6.7.2.
Rare, Threatened and Endangered Species	USACE (2001)	Atlantic sturgeon listing requires Section 7 consultation. Interim measures are being implemented as per agreement with NMFS. Streamlined consultation as per USFWS (2005) for piping plovers and seabeach amaranth is required prior to construction. Fedcons from 2006 and 2009 require endangered and rare plant and insect survey in Strathmere Natural Area.	6.8
Reserves, Preserves Parks and Public Land	USACE (2001)	Proposed taper into Strathmere Natural Area requires plant and insect survey prior to construction in this area as per Fed. Consistency Determination conditions (2006 and 2009).	6.9
Noise	USACE (2001)	Noises produced from dredging could affect marine life.	6.10
Cultural Resources	USACE (2001)	Expansion of Borrow Area C1 in 2009. No effect determination for cultural resources.	6.11
Cumulative Impacts	USACE (2001)	Multiple beach repair and restoration projects will be conducted in short time-frame with no significant cumulative effects. Project modifications will have no significant cumulative effects.	6.12

6.1 Mineral Resources

As discussed in USACE (2001), approximately 29.8 million cubic yards of sand were required from the offshore borrow sites over the 50-year life of the project. A more recent estimate in 2013 projects a significant reduction in sand quantity required over the project life to approximately 18.3 million cubic yards. Although sand resources will

be removed from the borrow sites, the sand will be redistributed to the shoreline and littoral system. Therefore, this does not result in a permanent consumptive loss of this resource.

USACE (2001) and Section 5.1 discuss the requirement for two of the offshore sand sources (M8 and a portion of L3) that require the approval from the Bureau of Ocean Management (BOEM), prior to utilization. Due to the time constraints based on an expedited schedule for project implementation, approval from BOEM is not likely at this time, therefore, M8 and the portion of L3 are being deferred for periodic nourishment. An additional NEPA document may be required by BOEM for these sites.

6.2 Air Quality

Air quality impacts resulting from the release of carbon monoxide and particulate emissions will occur at the site during project related activities and may be considered offensive, but are generally not considered far-reaching. Exhaust from the construction equipment will have an effect on the immediate air quality around the construction operation but should not impact areas away from the construction area. These emissions will subside upon cessation of operation of heavy equipment.

The 1990 Clean Air Act Amendments include the provision of Federal Conformity, which is a regulation that ensures that Federal Actions conform to a nonattainment area's State Implementation Plan (SIP) thus not adversely impacting the area's progress toward attaining the National Ambient Air Quality Standards (NAAQS). In the case of the Great Egg Harbor Inlet to Townsends Inlet Storm Damage Reduction Project, the Federal Action is to construct a berm and dune restoration project utilizing beachfill sand dredged from offshore sand sources. The U.S. Army Corps of Engineers, Philadelphia District would be responsible for construction. Cape May County, New Jersey within which the Federal Action will take place is classified as marginal nonattainment for ozone (oxides of nitrogen [NOx] and volatile organic compounds [VOCs]). Cape May County, NJ is within the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Nonattainment Area.

There are two types of Federal Conformity: Transportation Conformity and General Conformity (GC). Transportation Conformity does not apply to this project because the project would not be funded with Federal Highway Administration money and it does not impact the on-road transportation system. However, GC is applicable to this project. Therefore, the total direct and indirect emissions associated with project construction must be compared to the GC trigger levels presented below.

Pollutant	General Conformity Trigger Levels (tons per year)
NOx	100
VOCs	50

Subsequent to USACE (2001), the Philadelphia District conducted a project emissions inventory starting with a list of equipment necessary for construction as itemized in the project construction cost estimate. Pertinent construction equipment identified in the inventory included: hydraulic pipeline dredge, booster pump, various work boats and work barges, dozers and other earth moving equipment, and various trucks. The emissions contribution for each piece of equipment was calculated to identify total tons of VOCs and NOx released during project construction. The procedure to calculate these releases involved the following basic steps:

- List equipment, number of engines, engine hp, and duration of operation required for project construction
- Apply a Load Factor (LF) for each engine (the average percentage of rated horsepower used during an engine's operation). This calculation results in the total number of horsepower-hours (hp-hr) for each piece of equipment.
- Calculate total emissions of VOC and NOX from each engine category (multiply hp-hr by an emission factor (g/hp-hr). This calculation results in the total mass of VOC and NOX produced during project construction.

The total VOC emission estimate calculated for project construction is 16.3 tons, which is below the annual General Conformity trigger level of 50 tons/yr and therefore meets the conformity requirement for the project area.

The total NOx emission estimate for project construction without emissions control is 705.1 tons, as shown in Table 9 below. This value exceeds the 100 tons/yr trigger level and therefore an emissions reduction plan is required to bring project construction into compliance with the 100 tons/yr limit on NOx.

Table 9. Great Egg Harbor Inlet to Townsends Inlet Shore Protection Project - Initial Construction -NOX and VOC Estimate

PROJECT SEGMENT	**NOx Emissions (tons)**	**VOC's Emissions (tons)**
S. Ocean City	287.9	6.5
Ludlam Island (Strathmere, Sea Isle City, Whale Beach)	417.2	9.8
Total	**705.1**	**16.3**

At this stage, the Philadelphia District is in discussions with NJDEP and the Regional Air Team to develop a conformity plan; however, no viable plan is currently available. Therefore, compliance with the Clean Air Act is not met until an emissions reduction plan is developed and implemented prior to construction.

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6.3 Water and Sediment Quality

As discussed in USACE (2001), the discharges associated with offshore dredging for sand would result in short-term minor adverse impacts to water quality in the immediate vicinity of the dredging and beachfill placement. The direct impacts on water quality result from the associated dredging and discharge of a sand slurry material mixed with water as it is pumped on the beach and nearshore area. Most of the sediments are greater than 90% sands and gravels; therefore, suspended particles should settle-out quickly after discharge. Since there are no known sources of chemical contaminants within the affected areas such as dumpsites or industrial outfalls, it is expected that the material to be placed on the beaches and nearshore area will consist of clean sand. This is confirmed through vibracore analysis that has determined that the offshore borrow area contains sand that closely matches the existing beach sand. Additionally, the sand borrow areas M8, L1, L3 and C1 were sampled for bulk sediment organic and inorganic contaminants (Versar, 2004) none of the sediments exceeded NJDEP residential clean-up standards or Effects Range-Low values (from Long and MacDonald, 1995) suggesting that the material in the borrow areas does not pose human health or aquatic ecosystem risks. The extension of two stormwater outfalls by 46 meters (150 feet) at 82nd and 86th Street in Sea Isle City is not expected to significantly alter water quality from existing conditions. Temporary, minor and localized impacts to water quality associated with outfall extensions are expected due to construction-generated turbidity.

Turbidity could also be generated offshore if a barge or hopper of a hopper dredge is allowed to overflow. Since the material is beachfill quality sand with little amounts of fines present, these impacts are also expected to be minor. As such, the proposed project is not expected to violate State of New Jersey water quality standards. Section 401 Water Quality Certification was provided by NJDEP in 2006 and modified in 2009 for this project.

The changes in sand borrow area utilization as described in Section 4.2 will not result in any changes in the dredged material composition or water quality and the impacts are expected to be similar to those assessed in USACE (2001).

6.4 Dune and Upper Beach Habitat

USACE (2001) described the construction impacts on the upper beaches and dunes in the affected area. This action would greatly disturb the impacted beach and dune area during the construction and periodic nourishment phases; however, impacts to terrestrial upland vegetation are expected to be minor and temporary. Since there is little vegetation on the beach area, the direct impact on vegetation will mainly be limited to the existing constructed dune areas that require the dunes to be built-up to specified elevations. Existing vegetation on the constructed dunes is less diverse than the secondary dunes in Corson Inlet State Park and Strathmere Natural Area, which would not be affected. Because of the erosion experienced from recent storms including Hurricane Sandy, a fortified berm and dune system would have beneficial effects on

terrestrial beach and dune habitats within the project area. The proposed changes described in Section 4.2 affect offshore borrow area utilization, and are not expected to result in any new impacts on the dune and upper beach habitat beyond the impact assessment provided in USACE (2001).

6.5 Benthos

6.5.1 Benthos of Offshore Borrow Areas

A detailed discussion of impacts to the benthic community in the borrow areas is provided in USACE (2001). The primary ecological impact of dredging within the sand borrow sites will be the complete removal of the existing benthic community within the affected area through entrainment into the dredge. Dredging will primarily involve the immediate loss of infaunal and some of the less mobile epifaunal organisms including polychaetes (worms), mollusks (clams and snails), and crustaceans (amphipods and crabs). Some of the more noticeable and larger benthos that would be impacted includes horseshoe crabs and whelks. Mortality of these organisms will occur as they pass through the dredge device and/or as a result of being transplanted into an unsuitable habitat on the beach or nearshore. Despite the initial effects of dredging on the benthic community, recolonization is anticipated to occur within one year, but recovery of the benthic community through abundance, diversity, and biomass can be variable by taking a few months to several years (National Research Council, 1995). Recovery of offshore areas may take longer than the more dynamic inlet borrow areas such as Area C1.

USACE (2001) provided estimates of benthic habitat impacted based on an average dredging depth of 5 feet (This could be up to 10 feet if sand thicknesses allow). It was estimated then that a total of approximately 833 acres of sandy marine benthic habitat could be impacted from dredging associated with initial construction and a total of approximately 3,500 acres could be impacted over a cumulative 50-year project with periodic nourishment. The proposed changes in the borrow area usage plan will focus all dredging impacts in the borrow area L3 for initial construction and some early periodic nourishment cycles until M8 and C1 are available. However, this will not change the amount and type of benthic habitat being impacted. Therefore, the change in borrow area utilization as described in Section 4.2 is not expected to have any significant new impacts on benthic resources originally described in USACE (2001) as these impacts would be similar. The amount of overall bottom habitat affected would actually be less due to the reduction in dredging quantities for initial construction and periodic nourishment. As provided in Table 3, estimates of bottom habitat impacted based on current sand quantities needed for initial construction and periodic nourishment, and cumulative totals are less than the estimates in USACE (2001). Additionally, the availability of C1 for periodic nourishment will help reduce the usage from the offshore sites (which have longer benthic recovery periods) because C1 is expected to infill, and be reusable.

6.6 Fisheries

6.6.1 Shellfish

As discussed in USACE (2001), surfclams are the most prominent shellfish resource that would be impacted by project activities. The direct effect of dredging operations on the commercial shellfish of the region is of great concern to natural resource managers. There are no surfclam conservation zones (as established in N.J.A.C. 7:25-12) within the affected areas. An immediate effect is the removal of existing shellfish communities and alteration of the substrate composition, which may affect important nursery habitats and hinder surfclam recruitment success (Scott and Wirth, 2000).

The temporary loss of the surfclam resources within the borrow areas are unavoidable. USACE (2001) discussed that to minimize the impacts of the proposed project on the surfclam population, dredging would be conducted in the affected area only one time (with the exception of Corson Inlet Area) to allow for recruitment after the area is impacted. This practice may be suitable for the use of cutter-suction hydraulic dredges, which can excavate down to required depths at one time. However, a hopper dredge requires skimming the surface over a larger area, and these areas may need to be used again during periodic nourishment if sufficient quantities of sand remain. This would result in a disturbance to the same location dredged previously. Dredging depths could be restricted to allow for similar and sufficient depth of suitable substrate and physical/chemical conditions favorable for surfclam recruitment. Monitoring would be required to determine physical substrate and dissolved oxygen content along with determining rate of recruitment. Adaptive measures such as modifying dredging depths may be required if recruitment is poor within impacted areas. Other possible measures may include harvesting the clams prior to dredging. Within 6 months of dredging, the Philadelphia District will coordinate with the NJDEP Bureau of Shellfisheries to determine if a new surfclam survey is needed in the area. Results of such a survey would provide a basis if mitigative measures are necessary such as avoidance of high density areas.

A wintering female blue crab population could exist at the mouth of the Corson Inlet, which is the location of the C1 borrow area. Between December and March, these crabs burrow into the substrate to overwinter. Dredging during this timeframe could entrain these crabs and have an adverse effect on reproductive stock. This would represent an unavoidable impact on blue crabs within the borrow area. This impact could be avoided by dredging C1 between April and November; however, it may not be possible in all situations.

The change in borrow area utilization as described in Section 4.2 is not expected to have any significant new impacts on benthic resources including shellfish as originally described in USACE (2001). The amount of overall bottom habitat affected would actually be less due to the reduction in dredging quantities for initial construction and periodic nourishment. As provided in Table 3, estimates of bottom habitat impacted

based on current sand quantities needed for initial construction and periodic nourishment, and cumulative totals are less than the estimates provided in USACE (2001).

6.6.2 Finfish

USACE (2001) concluded that with the exception of some small finfish, most bottom and pelagic fishes are highly mobile and should be capable of avoiding entrainment into the dredging intake stream and the beachfill placement area. It is anticipated that some finfish would avoid the turbidity plume while others may become attracted to the suspension of food materials in the water column. Little impacts to fish eggs and larvae are expected because these life stages are widespread throughout the Middle Atlantic Bight, and are not particularly concentrated in the borrow site or surf zone of the project area (Grosslein and Azarovitz, 1982), however, dredging and beachfill placement in the spring and summer months may have greater adverse impacts on finfish spawning than during the fall and winter. Avoidance of important bottom features such as prominent shoals, stone beds, and artificial reefs were discussed in USACE (2001). Dredging and filling activities would also disrupt the benthic community having a temporary adverse impact on the food chain.

As discussed in 5.5.2, inlets along the New Jersey Coast provide important migratory pathways for a number of Federal and state managed fish. This also includes anadromous fish species such as the recently designated (but now withdrawn) candidate species (river herrings) for listing under the ESA. Peak migratory periods are in the spring and fall months. Dredging could potentially impact fish migrating through the inlet from the noise and turbidity generated during the operation. Turbidity can inhibit respiration in fish and affect sight feeders. Additionally, some of the smaller demersal species could be entrained in the dredge.

The Corson Inlet Borrow Area (C1) occupies an approximate 800-foot wide portion of the inlet, which is (at its narrowest point) about 1,800 feet wide (Figure 17). As shown in Figure 17, the borrow site flares out to the north and south outside of the inlet (where most of the site is situated on the ocean side of the inlet). For scaling purposes, a 300-foot long dredge is depicted in relation to the borrow area and inlet area. The highest potential for impacts to migratory fish during dredging is the westernmost portion of the borrow area where the inlet is at its narrowest. Here, a 300-foot dredge plus a 200-foot zone around it could occupy about 27% of the width of the inlet. Adverse effects on migratory fish can be minimized in that the material being dredged is over 90% sand, which will minimize the turbidity being suspended in the water column. This zone of influence may present a migratory barrier, but it does not occupy the entire inlet as migratory fish can move around it. Given the currents and turbulence naturally generated by waves and tides in and out of the inlet area, dredging impacts are expected to be minimal to migratory fish.

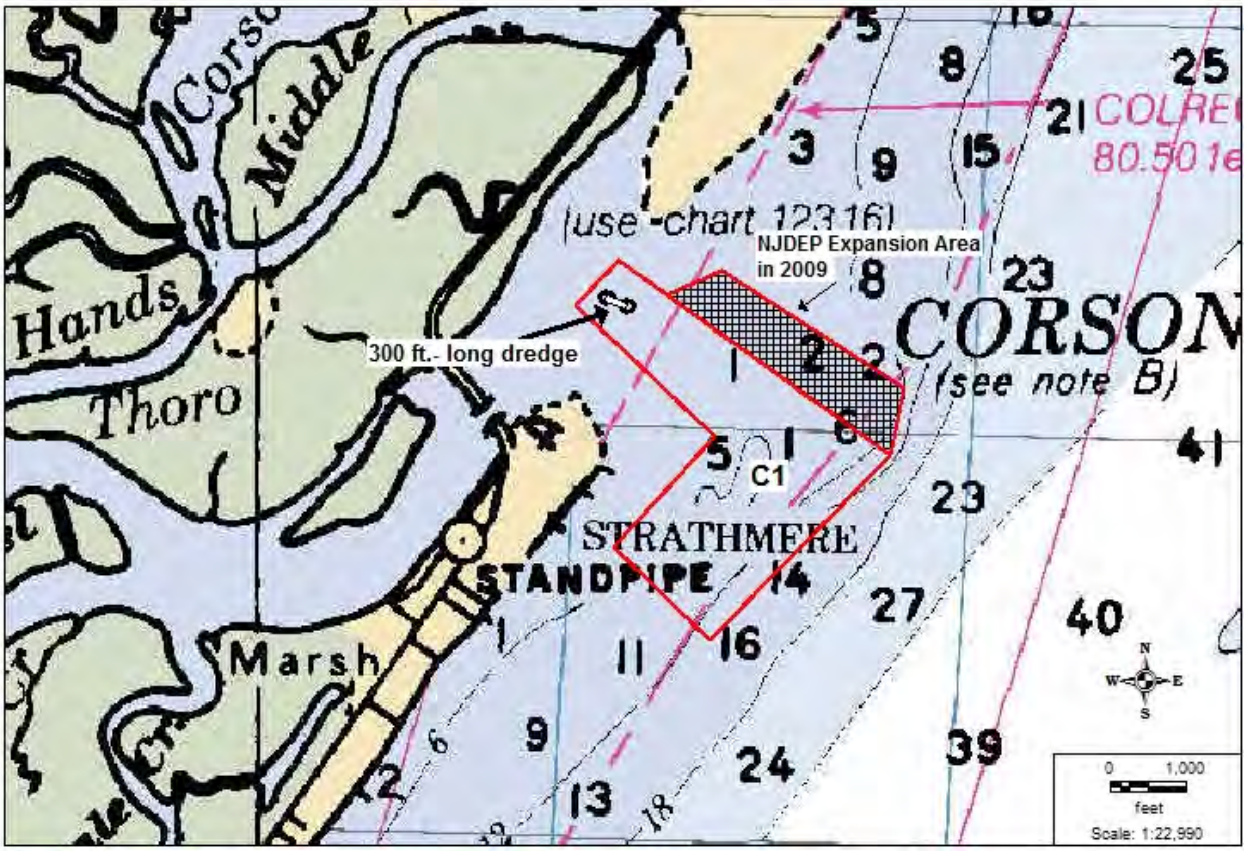

Figure 17. Corson Inlet (C1) Sand Borrow Area

The change in the borrow area usage plan from using M8, L3 and L1 for initial construction proposed in USACE (2001) to only using L3 for all of the initial construction will concentrate dredging activities in the L3 area. However, this is not expected to have any significant effect on finfish resources since it does not increase the overall effect on bottom habitats in the borrow areas. The overall bottom habitat usage would actually be less than estimates provided in USACE (2001) since sand quantity needs are less.

6.6.3 Prime Fishing Areas

Prime Fishing Areas (as identified in NJAC 7:7E-3.4) have been updated since 2001. As depicted in Figure 16, a portion of the C1 Borrow Area located at Corson Inlet is identified as a NJ Specific Sport Ocean Fishing Ground. This designation occurred subsequent to USACE (2001) and subsequent Federal coastal zone consistency certifications from the State of New Jersey in 2006 and 2009. Approximately 72 of the 243 acres in C1 are now under this designation. This area was designated due to the shoal waves that existed there and provide bottom features that fishermen would target. In 2009, this area within C1 was utilized by the NJDEP as a sand source for a beach replenishment project. Removal of sand from C1 may impact the designated fishing

ground, however, it is anticipated that due to the shoaling patterns in this inlet complex, this type of habitat would regenerate naturally soon after dredging.

A very small portion of prime fishing area (approx. 34 acres) is along the eastern border of Area L1. Given the size of the L1 area, the borders will be re-drawn to avoid this prime fishing area.

6.6.4 Essential Fish Habitat

As discussed previously, there are a number of Federally managed fish species where essential fish habitat (EFH) was identified for one or more life stages within the project impact areas. Fish occupation of waters within the project impact areas is highly variable spatially and temporally. Some of the species are strictly offshore, while others may occupy both nearshore and offshore waters. In addition, some species may be suited for the open ocean or pelagic waters, while others may be more oriented to bottom or demersal waters. This can also vary between life stages of Federally managed species. Also, seasonal abundances are highly variable, as many species are highly migratory.

In general, adverse impacts to Federally managed fish species may stem from alterations of the bottom habitat, which result from dredging offshore in the borrow sites and beachfill placement in the intertidal zone and nearshore. EFH can be adversely impacted temporarily through water quality impacts such as increased turbidity and decreased dissolved oxygen content in the dredging and placement locations. These impacts would subside upon cessation of construction activities. More long-term impacts to EFH involve physical changes to the bottom habitat, which involve changes to bathymetry, sediment substrate, and benthic community as a food source.

One major concern with respect to physical changes involves the potential loss of prominent offshore sandy shoal habitat within the borrow sites due to sand mining for the beach replenishment. It is generally regarded that prominent offshore shoals are areas that are attractive to fish including the Federally managed species, and are frequently targeted by recreational and commercial fishermen. Despite this, there is little specific information to determine whether shoals of this type have any enhanced value for fish. However, it is reasonable to expect that the increased habitat complexity at the shoals and adjacent bottom would be more attractive to fish than the flat featureless bottom that characterizes much of the mid-Atlantic coastal region (USFWS, 1999a).

Since mining of sand in these shoals may result in a significant habitat alteration, it is proposed that these areas be avoided or the flatter areas surrounding the prominent shoals be mined. Prominent shoal habitat was avoided as part of the borrow site screening process. This was accomplished by eliminating such sites with prominent shoal habitat such as the eastern portion of L1 and L2 because they would have impacted an area known as the “Sea Isle Lump”, which is considered an important sport

and commercial fishing ground (Long and Figley, 1982). Other physical alterations to EFH involve substrate modifications. An example would be the conversion of a soft sandy bottom into a hard clay bottom through the removal of overlying sand strata. This could result in a significant change in the benthic community composition after recolonization, or it could provide unsuitable habitat required for surfclam recruitment or spawning of some finfish species. This could be avoided by correlating vibracore strata data with sand thickness to restrict dredging depths to avoid exposing a different substrate. Based on the vibracore data, dredging depths would be considered to minimize the exposure of dissimilar substrates. Biological impacts on EFH are more indirect involving the temporary loss of benthic food prey items or food chain disruptions. Table 10 provides a brief description of direct or indirect impacts on the designated Federally managed species and their EFH with respect to their life stage within the designated EFH squares that encompasses the entire project impact area.

Of the 29 species identified with Fishery Management Plans, the proposed project could have immediate direct impacts on habitat for surfclams, black sea bass, scup, summer flounder, egg and larval stages of winter flounder and several shark species. This is attributable to the benthic or demersal nature of these species and their affected life stages. However, the effect on surfclams and other benthic food-prey organisms present in the borrow areas and sand placement areas is considered to be temporary as benthic studies have demonstrated recolonization following dredging operations within 1 to 2.5 years.

Table 10. Direct and Indirect Impacts on Federally Managed Species and Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)

Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
1. Atlantic cod *(Gadus morhua)*				**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
2. Whiting (Merluccius bilinearis)	Eggs are pelagic and are concentrated in depth of 50 – 150 meters, therefore no direct or indirect effects are expected.	Larvae are pelagic and are concentrated in depth of 50 –150 meters, therefore no direct or indirect effects are expected.	**Direct:** Occur near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary	

Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			disruption of benthic food prey organisms.	
3. Red hake *(Urophycis chuss)*	Eggs occur in surface waters; therefore, no direct or indirect effects are expected.	Larvae occur in surface waters; therefore, no direct or indirect effects are expected.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	
4. Winter flounder (Pseudop*leuronectes americanus*)	Eggs are demersal in very shallow waters of coves and inlets in Spring. Dredging in Corson Inlet may have some effect on eggs, however, borrow site is primarily in a high-energy area of the inlet where eggs are not likely to be highly concentrated.	Larvae are initially planktonic, but become more bottom-oriented as they develop. Potential for some to become entrained during dredging in Corson Inlet area.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
5. Windowpane flounder *(Scopthalmus aquosus)*	Eggs occur in surface waters; therefore, no direct or indirect effects are expected.	Larvae occur in pelagic waters; therefore, no direct or indirect effects are expected.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
6. Atlantic sea herring *(Clupea harengus)*			**Direct:** Occur in pelagic and near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** None, prey items are planktonic	**Direct:** Occur in pelagic and near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** None, prey items are primarily planktonic

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Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
7. Monkfish *(Lophius americanus)*	Eggs occur in surface waters with depths greater than 25 m; therefore, no direct or indirect effects are expected.	Larvae occur in pelagic waters with depths greater than 25 m; therefore, no direct or indirect effects are expected.		
8. Bluefish *(Pomatomus saltatrix)*			**Direct:** Juvenile bluefish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Adult bluefish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.
9. Long finned squid *(Loligo pealei)*	n/a	n/a	**Direct:** Adult squids tend to be demersal during the day and pelagic at night (Hammer, 2000). There is a potential for entrainment.	**Direct:** Adult squids tend to be demersal during the day and pelagic at night (Hammer, 2000). There is a potential for entrainment.
10. Short finned squid *(Illex ilecebrosus)*	n/a	n/a		
11. Atlantic butterfish *(Peprilus tricanthus)*			**Direct:** Juvenile butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	
12. Summer flounder *(Paralicthys dentatus)*		Larvae occur in pelagic waters; therefore, no direct or indirect effects are expected.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
13. Scup *(Stenotomus chrysops)*	n/a	n/a	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults should be capable of relocating during impact. **Indirect:** Temporary disruption of benthic food prey organisms.

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Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
14. Black sea bass *(Centropristus striata)*	n/a		**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. Offshore sites are mainly sandy soft-bottoms, however, some pockets of gravelly or shelly bottom may be impacted. Some mortality of juveniles could be expected from entrainment into the dredge. Approximately 0.7 to 1.0 acres of intertidal and subtidal rocky habitat may be impacted due to sand partially covering groins along the shoreline. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. Offshore sites are mainly sandy soft-bottoms, however, some pockets of gravelly or shelly bottom may be impacted. Approximately 0.7 to 1.0 acres of intertidal and subtidal rocky habitat may be impacted due to sand partially covering groins along the shoreline. **Indirect:** Temporary disruption of benthic food prey organisms.
15. Surfclam *(Spisula solidissima)*	n/a	n/a	**Direct:** Complete removal within borrow sites during dredging. Exposure of similar substrate is expected to allow for future recruitment. **Indirect:** Temporary reduction in reproductive potential. *See shellfish section for more discussion.	**Direct:** Complete removal within borrow site during dredging. Similar substrate would allow for recruitment. **Indirect:** Temporary reduction in reproductive potential. *See shellfish section for more discussion.
16. Ocean quahog *(Artica islandica)*	n/a	n/a		
17. Spiny dogfish *(Squalus acanthias)*	n/a	n/a		
18. King mackerel *(Scomberomorus cavalla)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Juveniles are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly migratory.	**Direct Impacts:** Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly migratory.
19. Spanish mackerel *(Scomberomorus maculatus)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Juveniles are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are	**Direct Impacts:** Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly

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Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			highly migratory.	migratory.
20. Cobia *(Rachycentron canadum)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct:** Cobia are pelagic and migratory species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Cobia are pelagic and migratory species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.
21. Sand tiger shark *(Odontaspis taurus)*		**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of young could be expected from entrainment into the dredge because they may be oriented with the bottom. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults are highly mobile and are capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.
22. Atlantic angel shark *(Squatina dumerili)*		**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of larvae could be expected from entrainment into the dredge because they may be oriented with the bottom. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults are mobile and are capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.
23. Dusky shark *(Charcharinus obscurus)*		**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Mortality from dredge unlikely because embryos are reported up to 3 feet in length (McClane, 1978). Therefore, the newborn may be mobile enough to avoid a dredge or placement areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		

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Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
24. Sandbar shark *(Charcharinus plumbeus)*		**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of larvae may be possible from entrainment into the dredge or burial in nearshore, but not likely since newborns are approx. 1.5 ft. in length (pers. conv. between J. Brady-USACE and H.W. Pratt-NMFS) and are considered to be mobile. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Juveniles are mobile and are capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults are highly mobile and are capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.
25. Tiger shark *(Galeocerdo cuvieri)*		Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Mortality from dredge or fill placement unlikely because newborn are reported up to 1.5 feet in length (McClane, 1978). Therefore, the newborn may be mobile enough to avoid a dredge or placement areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		
26. Atl. sharpnose shark *(Rhizopriondon terraenovae)*				**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults are highly mobile and are capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.
27. Clearnose skate (*Raja eglanteria*)		**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredged conditions. Juveniles are highly mobile, and most are capable of avoiding impact areas. Some entrainment into dredge is possible. **Indirect:** Temporary		**Direct**: Physical habitat in borrow sites should remain badsically similar to pre-dredge conditions. Juveniles are highly mobile and are capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and

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Direct And Indirect Impacts On Federally Managed Species And Essential Fish Habitat (EFH) In The 10 Min. X 10 Min. Squares Affected by the Project (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
		disruption of benthic food prey organisms and food chain within borrow area and placement sites.		food chain within borrow and placement sites.
28. Little skate (*Raja erinacea*)		**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredged conditions. Juveniles are highly mobile, and most are capable of avoiding impact areas. Some entrainment into dredge is possible. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow area and placement sites.		
29. Winter skate *(Raja ocellata*)		**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredged conditions. Juveniles are highly mobile, and most are capable of avoiding impact areas. Some entrainment into dredge is possible. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow area and placement sites.		

Minor elevation differences resulting from dredging may serve to enhance bottom habitat for a number of these species. Post-construction monitoring will be useful in determining the severity of habitat alterations and its direct and indirect impacts on EFH. Important physical/chemical parameters such as changes in substrate composition, dissolved oxygen levels, and bathymetry will be monitored. Biological monitoring would involve benthic grab samples to measure recruitment of the infaunal community, commercial surfclam surveys, and bottom trawls (if necessary) within affected areas. This monitoring would serve to provide valuable information early on in the project concerning the effects on EFH to base future adaptive management measures to minimize any adverse effects in subsequent periodic nourishment cycles.

Dredging activities within the narrowest part of an inlet such as at Borrow Area C1 could have potential impacts on fish migration patterns through the inlet by generating turbidity and noise. Given the size of the inlet at its narrowest point (1,800 feet), fish passage would be more than adequate, although there may be a temporary minor localized effect during dredging for several of the species listed in Table 11. This

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is because turbidity would be minor and short-term where sand is being dredged as re-suspension of sand particles settle out quickly in this dynamic environment. Fish encountering this turbidity and disturbance may seek passage around the affected area.

The change in borrow area utilization as described in Section 4.2 is not expected to have any significant new impacts to EFH as originally described in USACE (2001). The amount of overall bottom habitat affected would actually be less due to the reduction in dredging quantities for initial construction and periodic nourishment.

6.7 Wildlife

6.7.1 Birds

As discussed in USACE (2001), the project impact area of Peck Beach and Ludlam Island is host to a variety of migratory shorebirds, colonial nesting waterbirds, migratory waterfowl, raptors, and other passerine bird species (USFWS, 1999b). Of particular concern, are potential adverse impacts to migratory shorebirds and colonial nesting birds, which include several Federal and State listed threatened and endangered species (discussed in 6.8). USACE (2001) discussed the potential impacts on birds from noise and disturbance caused by construction activities on the beach. Beachfill placement in nesting areas with severe erosion could be beneficial provided that the construction is scheduled outside of nesting seasons. Timing restrictions and/or buffer zones should be established to avoid adversely impacting any nest sites in the project vicinity. The changes proposed in Section 4.2 involve the offshore sand borrow areas, and will not result in new or different impacts on birds.

6.7.2 Mammals, Reptiles and Amphibians

The impacts are expected to be temporary and minor. Wildlife inhabiting the beach and dune areas are expected to temporarily relocate from the impact area to adjacent habitats during placement of material on the beach, and are expected to return after construction is completed. Habitat value for terrestrial wildlife may improve slightly with a more stable vegetated dune and wider beach. The changes proposed in Section 4.2 involve the offshore sand borrow areas, and will not result in new or different impacts on terrestrial-oriented wildlife.

A number of marine mammals could be within the affected area during construction activities, and be affected by noise. A discussion on the effects of noise on marine life is provided in Section 6.9. The project changes as proposed in Section 4.2 are not expected to have any significant adverse impacts on marine wildlife beyond the impacts discussed previously in USACE (2001).

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6.8 Rare, Threatened and Endangered Species

USACE (2001) identified potential project impacts on beach nesting birds such as the piping plover, which is Federally listed as threatened and State listed as endangered, and the least tern and black skimmer (both State endangered species).

Beach replenishment can potentially have significant direct and indirect adverse impacts on these species. Sand placement can bury nests, and machinery on the beach can crush eggs, nestlings, and adults. Human disturbance related to noise and lights can disrupt successful nesting of these birds (Louis Berger Group, 1999). Also, pipelines used during construction may become barriers to young chicks trying to reach intertidal areas to feed. The presence of these species will require the implementation of protection measures, which may include the establishment of a buffer zone around the nest, and limiting construction to be conducted outside of the nesting period (15 March – 15 August).

Other indirect impacts associated with the proposed plan include the temporary reduction in the quality of forage habitat for piping plover and other shorebirds within the intertidal zone until the area becomes recolonized by benthic fauna such as polychaete worms, mollusks, and crustaceans. This impact may be short-lived as the area could become recolonized as early as a few weeks after filling is completed. The construction of a wider beach may result in the beach becoming more attractive to nesting birds such as piping plover, least tern, and black skimmers. Although this may appear beneficial, it is believed that this could have adverse impacts on these species. This is based on the fact that a replenished wider beach may attract these birds away from natural areas where human disturbance effects are less.

The candidate species, red knot, is a migratory shorebird that can be found on Atlantic Coast beaches during spring and fall migrations. Construction during this period (especially the fall migration) could affect foraging patterns by disturbing habitat and temporarily displacing a food source by burying intertidal benthic organisms. Since the affected area is a highly dynamic beach area, this would be a temporary effect.

Another species which may be found within the project area is the Federally-listed threatened plant, seabeach amaranth, which inhabits overwash flats, accreting ends of coastal barrier beaches and lower foredunes of non-eroding beaches. Seabeach amaranth has sporadically appeared in the project area within the last ten years. USFWS (2013) and USFWS (2005) reports that seabeach amaranth was present in Ocean City, Corson's Inlet State Park (north and south) and a sizable population in Strathmere in Upper Twp in the early 2000's. More recently, seabeach amaranth was only found in Ocean City from 2007 to 2012. Therefore, it is possible that seabeach amaranth may become naturally established within the project area within the life of the project. Since the proposed project may actually create habitat for the seabeach amaranth, impacts to this species are also possible related to construction of beach stabilization structures, beach erosion and tidal inundation, beach grooming, and destruction by off-road vehicles (USFWS, 1999).

To address these issues, the Philadelphia District developed and submitted a programmatic Biological Assessment (BA) for the piping plover and seabeach amaranth as part of formal consultation requirements to the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act in 2001. In 2005, the USFWS developed a Biological Opinion (BO) based upon their review of the BA. The requirements outlined in the BO were addressed as conservation measures in order to comply with this statute. Reasonable and prudent measures and the accompanying terms and conditions provided in the BO are nondiscretionary and were designed to minimize incidental take of piping plover as a result of Corps of Engineers activities along the coast, which includes this project. Formal consultation will be ongoing throughout the project life where the USFWS requires individual Tier 2 consultation prior to construction and each periodic nourishment cycle. The Section 7 consultation process is expected to result in monitoring before, during and after construction, imposing timing restrictions if piping plover nests are found or in areas where recent nesting activities have occurred, construction of temporary protective fencing, and avoidance during the construction with buffer zones. Other issues to be addressed include dune fence orientation, local practices such as beach raking, off-road vehicles, permanent easements for monitoring and management activities, and general public access in or near nesting locations. The project area, specifically the foredune area, would be periodically monitored for the seabeach amaranth. Contingency plans for the presence of seabeach amaranth at the time of initial construction or periodic maintenance may involve avoidance of the area (if possible), collection of seeds to be planted in non-impacted areas, and timing restrictions.

Storm-related changes to the beaches within the project area could have an effect on beach nesting birds such as the piping plover by either reducing their habitat from losses to erosion or by enhancing habitat by creating washover areas and losses in vegetative cover, which could have changes from historic nesting patterns. Potential changes in historic nesting patterns could be addressed through the Tier 2 streamlined consultation process as established in the programmatic BO prior to construction.

As discussed in USACE (2001), from June through November, New Jersey's coastal waters may be inhabited by transient sea turtles, especially the loggerhead (Federally listed threatened) or the Kemp's ridley (Federally listed endangered). Sea turtles have been known to be adversely impacted during dredging operations that have utilized a hopper dredge. Dredging encounters with sea turtles have been more prevalent among waters of the southern Atlantic and Gulf coasts; however, incidences of "taking" sea turtles have been increasing in waters of the Middle Atlantic Coast in hopper dredges, which utilize high-suction heads. Endangered whales such as the highly endangered Right whale may also transit the project area. As with all large vessels, there is a potential for a collision of the dredge with a whale that could injure or kill a whale. The proposed changes in borrow area utilization are not expected to change the effects on threatened or endangered sea turtles or marine mammals as described in USACE (2001).

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Formal consultation with the National Marine Fisheries Service (NMFS) in accordance with Section 7 of the Endangered Species Act has been undertaken on all Philadelphia District Corps of Engineers dredging projects utilizing a hopper dredge that may have impacts to Federally threatened or endangered species (including shortnose sturgeon, sea turtles, and marine mammals). A Biological Assessment (USACE, 1995) that discusses Philadelphia District hopper dredging activities and potential effects on Federally threatened or endangered species of sea turtles, marine mammals and shortnose sturgeon has been prepared, and was formally submitted to NMFS in accordance with Section 7 of the Endangered Species Act. A subsequent Programmatic Biological Opinion (BO) (NMFS, 1996) from NMFS was completed and submitted to the Corps in 1996. The BO includes the Great Egg Harbor Inlet to Townsends Inlet Project. As a term and condition of the incidental take statement included in this opinion, the NMFS required monitoring of all hopper dredge operations in areas where sea turtles are present between June and November by trained endangered species observers. Adherence to the findings and conditions of the Biological Opinion ensures compliance with Section 7 of the Endangered Species Act. Since 1996, projects that have utilized a hopper dredge between June and November have included NMFS approved sea turtle observers on the dredge to monitor for sea turtles during dredging. Observers inspect the hopper, skimmer, and draghead after each load looking for signs of interaction with endangered or threatened species. Recent changes to dredging protocols in the State of New Jersey now require all dredges being used for beach nourishment to be outfitted with munitions screening of 1 ¼ inches. This size screening makes it highly unlikely that turtle monitors would be able to observe any impacts to turtles during the dredging activities. For this reason, NMFS has not required the presence of monitors for recent hopper dredging activities where turtle monitoring screens are required. The Corps will continue to coordinate this issue with NMFS for upcoming work.

As discussed previously, the New York Bight Distinct Population Segment (DPS) of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) was recently listed as endangered by the NMFS, and although transient in the marine environment, this species could be present within the project area. With regard to physical injuries to the Atlantic sturgeon, the potential exists for them to become entrained during dredging operations. It is expected that, however, that most adult sturgeon would actively avoid a working dredge. As with other fish species, the temporary impacts to water quality due to increased turbidity can impact prey availability during construction activities. Noise generated from a working dredge at the dredge site and beachfill placement could potentially be a factor affecting sturgeon. However, it is expected that sturgeon will avoid the borrow areas and beaches during construction. Due to the open water nature of the borrow sites, this temporary movement away from the borrow areas does not constitute a significant effect on this species. For these reasons, the Philadelphia District has concluded that project activities could affect, but are not likely to adversely affect the NYBDPS of the Atlantic sturgeon. By letter of February 21, 2013, the Philadelphia District reinitiated consultation in accordance with 50 CFR 402.14(c) under Section 7 of the Endangered Species Act to address the District's beach nourishment projects' effects on Atlantic Sturgeon. A Programmatic Biological Assessment is

currently being prepared by the Philadelphia District to cover all existing and proposed storm damage reduction projects within the Philadelphia District. This will be followed by a new BO to be issued by NMFS. In the interim, the Philadelphia District has determined that allowing the District's beach nourishment program to continue to operate during the re-initiation period will not violate Section 7(a)(2) or 7(d). This also includes projects that are presently authorized, but unconstructed such as the Great Egg Harbor Inlet to Townsends Inlet Storm Damage Reduction Project. This determination was made as part of coordination with the National Marine Fisheries Service (see Appendix A). The Philadelphia District recognizes that this 7(a)(2) determination is only applicable during the re-initiation period, and does not address the Corps' longer term obligation to ensure the action is not likely to jeopardize the continued existence of listed species.

As a condition of the Federal Coastal Zone Consistency Determination in 2006 and the modification in 2009, the Philadelphia District is required to conduct surveys for rare and endangered plant and insect species within the Strathmere Natural Area, if beachfill is to extend into this area. These surveys are to be coordinated with the Office of Natural Lands Management.

The proposed project changes as described in Section 4.2 are not expected to result in any significant changes to threatened and endangered species impacts as originally described in USACE (2001).

6.9 Reserves, Preserves, Parks and Public Land

The impacts of the proposed project on Corson's Inlet State Park and Strathmere Natural Area were addressed in USACE (2001). The Corson's Inlet State Park shoreline on the north side of the Corson Inlet has experienced significant erosion from recent storms. Although the proposed plan does not place sand in this area, the infusion of sand in the adjacent southern Ocean City portion will provide indirect benefits by adding more sand into the littoral system that has a net littoral drift southward.

A Coastal Barrier Resources Act (CBRA) designated area is located on both sides of Corson Inlet, and is identified as "NJ-08P". This area (NJ-08P) is designated as an "Otherwise Protected Area (OPA)". Congress determined that OPA's should not be included as part of the Coastal Barrier Resources System (CBRS), but would be ineligible for Federal flood insurance after November 16, 1991. Because of this designation, the proposed project actions are not restricted under CBRA.

In accordance with the Federal Coastal Zone Consistency Determination from NJDEP (2006 and 2009), the proposed project taper into the Strathmere Natural Area will require surveys for endangered and rare plants and insects.

6.10 Noise

Subsequent to USACE (2001) project generated noise effects on fish and wildlife was reevaluated. Project-related noise at the placement site during construction will consist of the sound of dredged material passing through the pipe and discharging in a plume of water. Earth-moving equipment, such as bulldozers, will shape the newly deposited dredged material and produce engine noise in the nearby vicinity. Utilizing heavy machinery fitted with approved muffling apparatus reduces noise, and vibration will reduce noise impacts.

At the offshore borrow areas, hydraulic suction dredging involves raising loosened material to the sea surface by way of a pipe and centrifugal pump along with large quantities of water. Suction dredgers produce a combination of sounds from relatively continuous sources including engine and propeller noise from the operating vessel and pumps and the sound of the drag head moving across the substrate. Robinson et al. (2011) carried out an extensive study of the noise generated by a number of trailing suction hopper dredgers during marine aggregate extraction. Source levels at frequencies below 500 hertz (Hz) were generally in line with those expected for a cargo ship travelling at modest speed. The dredging process is interspersed with quieter periods when the dragheads are raised to allow the dredge to change positions. Clarke et al. (2003) evaluated sound levels produced by a hopper dredge during its “fill” cycle working in a sandy substrate. They found that most of the sound energy produced fell within the 70 to 1,000 Hz range, with peak pressure levels in the 120 to 140 decibel (dB) range at 40 meters from the dredge. These data correlate well with a study conducted in the United Kingdom which found trailing suction hopper dredge sounds to be predominately in the low frequency range (below 500 Hz), with peak spectral levels at approximately 122 dB at a range of 56 meters (DEFRA, 2003).

In a review by Southall et.al. (2007) several studies showed altered behavior or avoidance by dolphins to increased sound related to increased boat traffic. Clarke et al. (2004) found that cutterhead dredging operations are relatively quiet compared to other sounds in aquatic environments, whereas hopper dredges produce somewhat more intense sounds. Thomsen et al. (2009) conducted a field study to better understand if and how dredge-related noise is likely to disturb marine fauna. This study found that the low-frequency dredge noise would potentially affect low- and mid-frequency cetaceans, such as bottlenose dolphins. Noise in the marine environment has also been responsible for displacement from critical feeding and breeding grounds in several other marine mammal species (Weilgart, 2007). Noise has also been documented to influence fish behavior (Thomsen et al., 2009). Fish detect and respond to sound utilizing cues to hunt for prey, avoid predators, and for social interaction (LFR, 2004). High intensity sounds can also permanently damage fish hearing (Nightingale and Simenstad, 2001). It is likely that at close distances to the dredge vessel, the noise may produce a behavioral response in mobile marine species, with individuals moving away from the disturbance, thereby reducing the risk of physical or physiological damage. Accordingly, any resulting effects would be negligible.

6.11 Cultural Resources

Five potentially significant cultural resources are within the project construction boundaries; however, impacts to these resources will either be avoided or minimized. These measures include archaeological monitoring of Anomalies I, II and III during sand placement activities, the inspection of MEC baskets for the presence of artifacts by the archaeological monitor and the application of 500-foot radius buffers around both Target 21:82 and Target 45:63.

The USACE has determined that if the above measures are applied the proposed project will have No Adverse Effect on historic properties eligible for or listed on the National Register of Historic Places pursuant to 36 CFR Part 800.5(b).

6.12 Cumulative Impacts

Cumulative Impacts, as defined in CEQ regulations (40 CFR Sec. 1508.7), are the "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

USACE (2001) provided a comprehensive analysis of the cumulative effects of the use of sand borrow areas and affected beaches where beach nourishment projects have occurred or were in various planning stages to occur within the Philadelphia District boundaries (from Manasquan Inlet to Cape May). At that time, most of the coastal areas within this segment of the NJ Coast either had an existing Federal project or were under study for a Federal project. An exception to this is the segment from Hereford Inlet to Cape May Inlet (Wildwood, NJ), which is currently under a Federal Storm Damage Reduction Feasibility Study. The 2001 evaluation included all of the existing sand borrow areas and proposed sand borrow areas, which included inlet borrow areas and offshore borrow areas. It was estimated that over 9,000 acres of marine subtidal habitat would be affected over a period of 50 to 60 years for Corps of Engineers designated borrow areas. A separate evaluation was of potential borrow areas identified as “regions of interest” in Federal waters by the Bureau of Ocean Energy Management (formerly the Minerals Management Service). These regions of interest occupied over 23,000 acres of marine offshore habitat. At present, these regions of interest are not considered in the cumulative analysis because the Corps’ identified borrow areas are considered adequate with a few exceptions.

Since 2001, several of the Federal projects that were listed as proposed in USACE (2001) became active. These included The Lower Cape May Meadows, Townsends Inlet to Cape May Inlet, Absecon Island (partially constructed at Ventnor and Atlantic City), Brigantine Island, and Barnegat Inlet to Little Egg Inlet (partially constructed at Surf City, Ship Bottom, Harvey Cedars, and Brant Beach). Additionally,

the State of New Jersey and local municipalities conducted beachfill projects in Strathmere (Upper Township), Sea Isle City, and the City of Wildwood in 2009-2010 where there were no existing active Federal projects in place. Presently the area from Hereford Inlet to Cape May Inlet, which encompasses the City of Wildwood is in a feasibility study. The tentatively selected plan is the back passing of sand from a donor beach to beaches that require nourishment. Because this is a different type of project than the beachfill projects described above, and specific details are not known, it is not included in this discussion. USACE (2001) estimated that approximately 71% of the New Jersey Coastline either had an active Federal project or was proposed for a Federal project. The implementation of the existing unconstructed Federal projects does not change this estimate.

Since 2001 there were some minor changes to the existing borrow area configurations for the active Federal projects at Ocean City (Great Egg Harbor and Peck Beach) and Absecon Island. These changes resulted in the expansions of two designated borrow areas, which added approximately 100 acres to the sites listed in USACE (2001). The Corson Inlet (C1) borrow area was expanded by about 46 acres for a NJDEP project in 2009-2010. A new offshore borrow area was added to the Cape May City project in 2008, which is identified as Area K, and affects 408 acres of marine offshore habitat. Although these sites resulted in approximately 550 more acres of marine habitat affected by dredging over the long-term, they do not add significant acreage to the total borrow areas designated within Philadelphia District. As discussed in USACE (2001), the impacts on borrow area habitats are considered short-term as these areas become recolonized with benthic organisms, which are an important food source for a number fish species.

In recent years, the New Jersey Coast has been affected by catastrophic coastal storms, most notably Hurricane Sandy in October 2012. In response to the devastation of the Atlantic coastal communities in New Jersey from Hurricane Sandy, the USACE and the Federal Emergency Management Agency (through aid to State and local municipalities) have undertaken unprecedented measures to repair and/or restore the affected beaches under P.L. 84-99 Flood Control and Coastal Emergencies (FCCE) and P.L. 113-2: Disaster Relief Appropriations Act. P.L. 84-99 allows for the repair of beaches with active Federal projects to pre-storm conditions and P.L. 113-2 allows for the restoration of affected beaches to full template that have existing active Federal projects. Also, as part of P.L. 113-2, there is the funding to complete authorized, but unconstructed projects, which include the Great Egg Harbor Inlet to Townsends Inlet and the Manasquan Inlet to Barnegat Inlet projects.

Since November of 2012, several of the authorized and constructed projects within the Philadelphia District have been completed or are currently undergoing repairs and restoration in accordance with P.L. 84-99 and P.L. 113-2 (Figure 18). These projects include: portions of the Barnegat Inlet to Little Egg Inlet (Harvey Cedars, Surf City, and Brant Beach), Brigantine Island, and Absecon Island (Atlantic City and Ventnor), and Townsends Inlet to Hereford Inlet (Avalon and Stone Harbor). The

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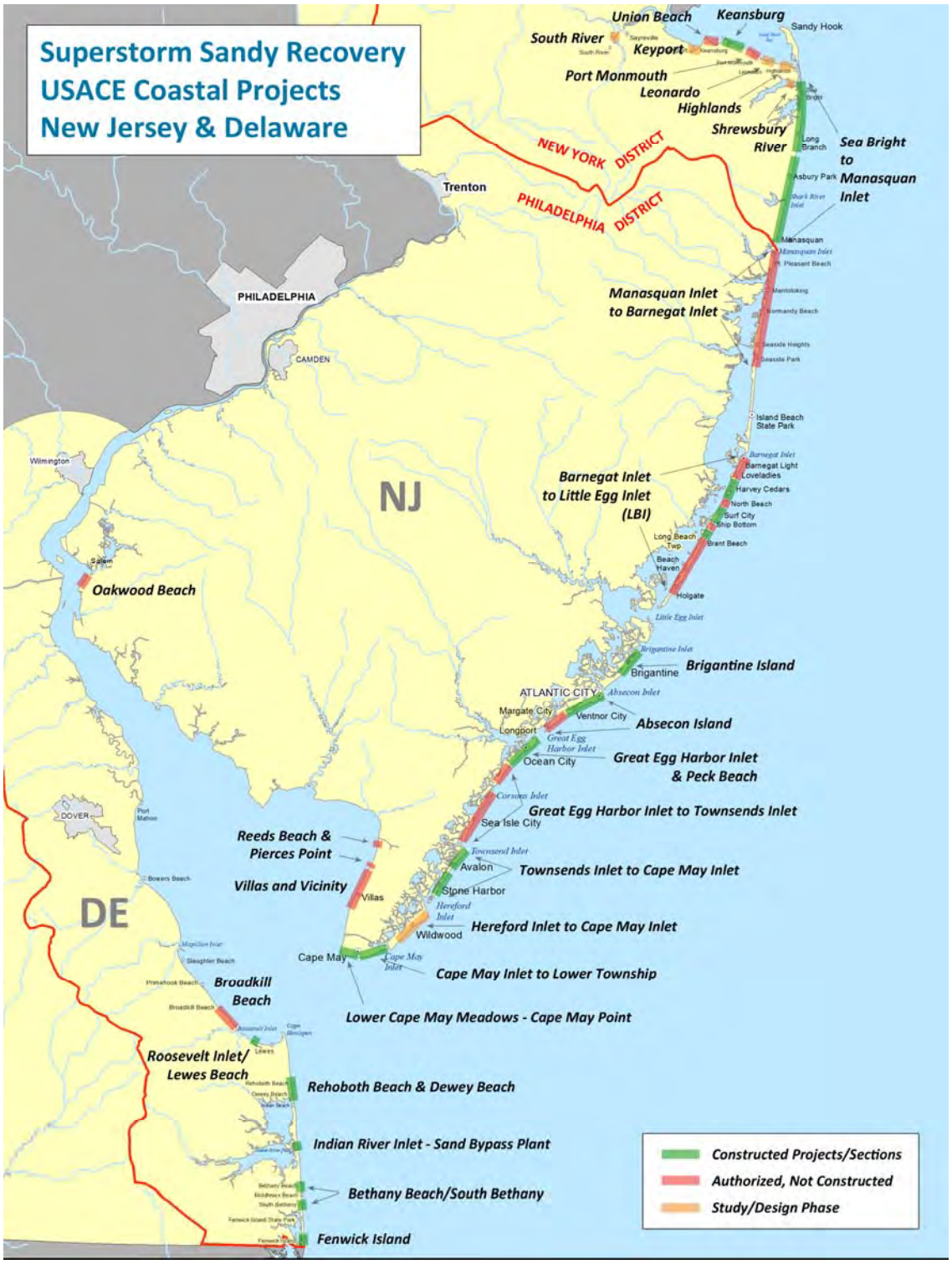

Figure 18. Status of Storm Damage Reduction Projects within the Philadelphia District

Ocean City - Peck Beach (Northern Ocean City) project and Lower Cape May Meadows were already scheduled for periodic nourishment at the time Hurricane Sandy struck. Cape May City is scheduled to start repair and restore activities in September 2013. The remaining authorized, but unconstructed projects are Great Egg Harbor Inlet to Townsends Inlet (Southern Ocean City, Strathmere, Upper Township, and Sea Isle City) and Manasquan Inlet to Barnegat Inlet (Seaside Park, Seaside Heights, Normandy Beach, Mantoloking, and Point Pleasant Beach). USACE (2001) estimated that approximately 71% of the New Jersey Coastline within the Philadelphia District Boundaries would be affected by a storm damage reduction project. Although nearly 71% of the beaches along the N.J. Coast south of Manasquan Inlet could potentially be impacted by beachfill placement activities, the cumulative effect of these combined activities is expected to be temporary and minor on resources of concern such as benthic species, beach dwelling flora and fauna, water quality and essential fish habitat. This is due to the fact that flora and fauna associated with beaches, intertidal zones and nearshore zones are adapted to and resilient to frequent disturbance as is normally encountered in these highly dynamic and often harsh environments. USACE (2001) concluded that among the existing and proposed projects along this stretch of coast, renourishment cycles vary from two to seven years, which would likely preclude all of the beachfill areas being impacted at one time. However, the massive effort to repair and restore the New Jersey coastline all of this area could be affected within a 2-3 year period. Given the short-term effects of the sand replenishment on the beaches, this is not a significant cumulative impact.

USACE (2001) estimated that approximately 9,000 acres of sand borrow areas, which represent both inlet ebb shoal habitats and marine offshore habitats within the Philadelphia District would be impacted. Since 2001, several borrow sites were expanded and or new ones used. These expansions and additions of sand resources account for about 550 more acres, which is about a 6% increase in borrow areas. The use of these sites to conduct repair and restoration activities for the Hurricane Sandy work do not result in a major expansion of borrow areas and effects to the marine environment compared to what was projected in USACE (2001). Therefore, the cumulative effects of this action and others are not significant.

7.0 COMPLIANCE WITH ENVIRONMENTAL STATUTES

Compliance with applicable Federal Statutes, Executive Orders, and Executive Memoranda, was originally discussed in (USACE 2001). Table 12 is a complete listing of compliance status relative to environmental quality protection statutes and other environmental review requirements.

Table 11. Compliance with Environmental Quality Protection Statutes and Other Environmental Review Requirements	
FEDERAL STATUTES	**COMPLIANCE W/PROPOSED PLAN**
Archeological - Resources Protection Act of 1979, as amended	Full
Clean Air Act, as amended	Noncompliance
Clean Water Act of 1977	Full
Coastal Barrier Resources Act	Full
Coastal Zone Management Act of 1972, as amended	Full
Endangered Species Act of 1973, as amended	Full
Estuary Protection Act	Full
Federal Water Project Recreation Act, as amended	N/A
Fish and Wildlife Coordination Act	Full
Land and Water Conservation Fund Act, as amended	N/A
Marine Protection, Research and Sanctuaries Act	Full
Magnuson-Stevens Fishery Conservation and Management Act	Full
National Historic Preservation Act of 1966, as amended	Full
National Environmental Policy Act, as amended	Partial
Rivers and Harbors Act	Full
Watershed Protection and Flood Prevention Act	N/A
Wild and Scenic River Act	N/A
Executive Orders, Memorandums, etc.	
EO 11988, Floodplain Management	Full
EO 11990, Protection of Wetlands	Full
EO12114, Environmental Effects of Major Federal Actions	Full
EO 12989, Environmental Justice in Minority Populations and Low-Income Populations	Full
County Land Use Plan	Full

Full Compliance - Requirements of the statute, EO, or other environmental requirements are met for the current stage of review.
Partial Compliance - Some requirements and permits of the statute, E.O., or other policy and related regulations remain to be met.
Noncompliance - None of the requirements of the statute, E.O., or other policy and related regulations have been met.
N/A - Statute, E.O. or other policy and related regulations are not applicable.

- **National Environmental Policy Act (NEPA)**: The Final Environmental Impact Statement (FEIS) (USACE, 2001) was filed in 2002. A Record of Decision (ROD) was signed on October 18, 2011. This draft Environmental Assessment and Finding of No Significant Impact (FONSI) provides an updated review of the project and affected resources. Full compliance with NEPA will be achieved when the FONSI is signed.
- **Endangered Species Act/Fish and Wildlife Coordination Act**. Subsequent to the FEIS, a programmatic Biological Opinion (BO) was issued by the USFWS (USFWS, 2005) concerning the Federally listed threatened piping plover and seabeach amaranth in accordance with Section 7 of the Endangered Species Act. Because locations of these species vary from year to year, the BO recommends a Tier 2 streamlined formal consultation prior to initial construction

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and each subsequent nourishment cycle. This streamlined consultation is consistent with monitoring provisions discussed in the FEIS and Final Section 2(b) Fish and Wildlife Coordination Act (FWCA) Report. Additionally, the streamlined consultation will afford the Corps of Engineers opportunities to periodically coordinate with USFWS with respect to the FWCA, if warranted. A final FWCA 2(b) report was provided by USFWS in July 2001. A programmatic BO was completed by the National Marine Fisheries Service in 1996 to address hopper dredging activities and their effects on threatened and endangered sea turtles and marine mammals. In 2012, the New York Bight Distinct Population Segment of the Atlantic sturgeon was listed as endangered by the NMFS. The Philadelphia District has reinitiated formal consultation in accordance with Section 7 of the Endangered Species Act with NMFS.

- **Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)**. An evaluation for Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act was performed in the FEIS, and conservation recommendations were provided by the NMFS. Subsequent to USACE (2001), the Philadelphia District conducted a new EFH assessment (contained within this EA) to address changes in the project, additions of new Federally managed species, and changes in existing conditions. The Philadelphia District is requesting a review of the EFH assessment in this EA.
- **Clean Water Act Section 404(b)(1) Evaluation**. An evaluation was performed in accordance with the Section 404(b)(1) guidelines in the FEIS in September 2001.
- **Clean Water Act Section 401 Water Quality Certification (WQC).** A Section 401 WQC was provided by NJDEP in 2009. This WQC was later modified in 2009 to include an expansion of the C1 Borrow Area.
- **Coastal Zone Management Act Federal Consistency Determination.** A Federal consistency determination was provided by NJDEP in 2009. This determination was later modified in 2009 to include an expansion of the C1 Borrow Area.
- **Coastal Barrier Resources Act (CBRA).** Project actions within the CBRA area "NJ-08P" are not restricted under CBRA because this area is designated as an "Otherwise Protected Area (OPA)".
- **Section 106 National Historic Preservation Act**. In 2001, the NJSHPO concurred with the District's "No adverse effect" determination provided that identified targets exhibiting shipwreck characteristics be avoided with the implementation of no entry - buffer zones and monitoring during construction. A subsequent no effect determination was concluded by the NJSHPO in 2009 for the expansion of the C1 Borrow Area.
- **Clean Air Act (CAA)**. A CAA statement of conformity was signed in 2001. However, subsequent to the FEIS, the Corps of Engineers performed an analysis of NOx and VOC emissions resulting from project construction activities. The NOx emissions exceed the threshold that triggers General Conformity. The Philadelphia District is coordinating with the NJDEP and the Regional Air Team to develop a conformity plan; however, no viable plan is currently available.

Therefore, compliance with the Clean Air Act is not met until an emissions reduction plan is developed and implemented prior to construction.

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8.0 CONCLUSIONS

In 2001, USACE completed an FEIS for a Federal Storm Damage Reduction Project for the communities of Ocean City, Upper Township (Strathmere and Whale Beach), and Sea Isle City. This EA evaluated the impacts associated with changes that have occurred since the FEIS was completed in 2001. New information, new statutes and the development of different operating practices subsequent to USACE (2001) required that the proposed Federal action be evaluated pursuant to the National Environmental Policy Act of 1969, as amended.

The evaluations presented in this EA address the changes in the project area, changes in the proposed project, and regulatory changes, are consistent with the project actions previously detailed and documented, and would not result in any new or significant impacts to the project area. Based on the data presented and continuing coordination with State and Federal resource agencies, no significant adverse environmental impacts are expected to occur as a result of the proposed project changes. Since the potential impacts from these changes identified have been determined to be minor, localized and temporary, the preparation of a new or Supplemental Environmental Impact Statement is not warranted and a Finding of No Significant Impact (FONSI) for the proposed action is appropriate.

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APPENDIX-A

PERTINENT CORRESPONDENCE

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

JON S. CORZINE
Governor

LISA P. JACKSON
Acting Commissioner

Division of Land Use Regulation
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David Rosenblatt, Administrator
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P.O. Box 419
Trenton, New Jersey 08625-0419

RE: Great Egg Harbor Inlet to Townsends Inlet Feasibility Study
Feasibility Report & Integrated Environmental Impact Statement
Federal Consistency Determination and Section 401 Water Quality Certification
Land Use Regulation File No. 0500-02-0001.1 CDT 050001
X-Reference: LUR File No. 0500-02-0001.1 CDT 020001 & File No. 0500-01-0002.1

Dear Mr. Arabatzis and Mr. Rosenblatt:

The New Jersey Department of Environmental Protection, Land Use Regulation Program (LUR), acting under Section 307 of the Federal Coastal Zone Management Act (P.L. 92-583) as amended, has reviewed your September 14, 2005 request for a final consistency determination for the storm damage reduction plan that has been developed under the "Great Egg Harbor Inlet to Townsends Inlet Feasibility Study, Feasibility Report, Integrated Environmental Impact Statement (EIS)", Appendix A through D, Volumes 1 through 4, dated September 2001. Based on submitted information, including the correspondence from Minas Arabatzia dated November 14, 2005, the electronic submissions from Kelly Donnelly on February 23, 2006 and from David Rosenblatt on February 26, 2006, and also based on the information presented by ACOE staff at the NJDEP's February 2, 2006 Natural Areas Council meeting, the Program has determined that the beach nourishment, protective berm and dune construction plan is consistent with New Jersey's Coastal Zone Management Rules N.J.A.C. 7:7E-1.1 et seq , as amended to February 6, 2006 and the applicable Rules guiding issuance of a Section 401 Water Quality Certificate, **provided that the conditions discussed below are met to the satisfaction of the Department of Environmental Protection.**

LURP File No. 0103-04-0028.1 CDT 040001

Project Description

The U.S. Army Corps of Engineers (ACOE) has selected a project plan intended to provide shore protection for the communities of Ocean City, Upper Township and Sea Isle City, Cape May County, New Jersey. Hurricane and storm damage reduction will be provided by beach nourishment and dune construction utilizing sand obtained from offshore borrow areas.

The selected plan for South End Ocean City consists of a berm and dune utilizing sand obtained from the offshore borrow source identified as "M8". The dune crest has a top elevation of +12.8 ft. NAVD88, while the berm extends from the seaward toe of the dune for a distance of 100 feet at an elevation of +7.0 ft. NAVD88 before sloping down at 1V:25H to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) is 218 feet.

The plan extends from 34th Street to 59th Street for a total length of 2.6 miles. Initial sand quantity is estimated at 1,603,000 cubic yards. Periodic nourishment of 403,000 cubic yards is scheduled to occur every 3 years synchronized with the existing Federal beachfill project at Ocean City (Great Egg Harbor Inlet to 34th Street).

The selected plan for Ludlam Island also consists of a berm and dune utilizing sand obtained from the offshore borrow sources identified as "L3", "L1", and Corson Inlet Ebb Shoal known as "C1". The dune crest has a top elevation of +14.8 ft. NAVD88, while the berm width extends from the seaward toe of the dune for a distance of 50 ft. at an elevation of +6.0 ft. NAVD88 before sloping down (varying from 1V:30H to 1V:50H) to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to MHW varies from 190 to 285 feet depending upon location.

The plan extends from about 125 feet north of Seaview Avenue in Strathmere to Pleasure Avenue (just beyond 93rd Street) in Sea Isle City for a total length of 6.5 miles. In addition, there is a taper of 734 feet into Corson's Inlet State Park and a taper of 66 feet into the terminal groin south of 93rd Street in Sea Isle City. Total length of beachfill, including tapers, is 6.7 miles. The plan also includes the extension of two stormwater outfall pipes by 150 feet at 84th and 88th Streets in Sea Isle City. Initial sand quantity is 5,146,000 cubic yards. Periodic nourishment of 1,820,000 cubic yards is scheduled to occur every 5 years.

The following discussion includes an evaluation of project compliance with New Jersey's Coastal Zone Management Rules (N.J.A.C. 7:7E-1.1 et seq.), and identifies the conditions under which the project is found consistent with the rules. This consistency determination is issued subject to compliance with these specific conditions. **Be advised that all terms and agreements identified in the Department of the Army and LUR documents pertaining to the Draft**

Feasibility Report and Integrated Environmental Impact Statement (LUR File No. 0500-01-0002.1) and the ACOE's prior submittal of the September 2001 Great Egg Harbor Inlet to Townsends Inlet Feasibility Study, Feasibility Report, Integrated Environmental Impact Statement Final Feasibility Study (LUR File No. 0500-02-0001.1 CDT 020001) remain in affect, unless they are specifically herein superceded.

1. Surf Clam Areas (N.J.A.C. 7:7E-3.3)

Surf Clam Areas are waters within which can be demonstrated to support significant commercially harvestable quantities of surf clams or areas important to the recruitment of surf clam stocks. Development that would result in the destruction, condemnation, or contamination of surf clam areas is prohibited, except sand and gravel mining to obtain material for beach nourishment. This is only acceptable when the beach nourishment project is in the public interest and there are no prudent and feasible alternative offshore borrow site that would result in less impact to marine fish and fisheries. In addition, impacts to surf clam areas are minimized by designing the beach nourishment project to minimize the volume of sand borrowed from the surf clam area and the borrow cut is designed to minimize the area disturbed, for example, by designing a deeper cut. The borrow site must be located to avoid those more productive surf clam areas and when appropriate, notice shall be provided to clammers in advance of the mining operation to allow for surf clam harvest. Sand mining is not acceptable within a surf clam conservation area as defined at N.J.A.C. 7:25-12.

Based on the information provided and prior coordination with the NJDEP Bureau of Shellfisheries (BSF), the ACOE was effective in selecting sites with reduced impacts on fish/shellfish resources. BSF concurs with the choice of the proposed borrow areas in the selected plan, identified as "M8", "L3", "L1", and "C1". The ACOE proposes to perform a surf clam survey during the PED phase of the project to provide an update on the condition of commercial surf clam stocks prior to construction. The ACOE has indicated that this is necessary due to the potential variability of surf clam stocks that may occur over the period of time from the feasibility study to construction. The ACOE has amended the monitoring plan to eliminate the proposal for pre-dredge harvest if significant commercial stocks are identified within the sand borrow site locations because this rule requires that the availability of alternative borrow areas and minimization or project design and disturbance must be explored first.

Conditions:

a) If commercial densities of surf clam are found at a particular borrow site during the PED phase or subsequent monitoring, the ACOE must coordinate with BSF to identify alternative locations or procedures that could be implemented to avoid impact to the productive habitat before any construction bids are sought, and no contracts shall be awarded until this alternatives analysis process is completed to the satisfaction of Land Use Regulation.

b) Based on recommendations from BSF (ref: letter to Robert Callegari dated April 26, 1999), dredging activities shall not expose clay or mud substrates, which would be unsuitable habitat for surf clam recovery. The ACOE shall conduct all pre-dredging geo-technical work and borrow area management necessary to ensure that exposure of these substrate types does not occur.

2. Prime Fishing Areas (N.J.A.C.7:7E-3.4) & Shipwrecks and Artificial Reefs (N.J.A.C. 7:7E-3.13)

Prime fishing areas include tidal water areas and water's edge areas, which have a demonstrable history of supporting a significant local quantity of recreational or commercial fishing activity. The area includes all coastal jetties and groins, public fishing piers or docks and artificial reefs. Prohibited uses include sand or gravel submarine mining which would alter existing bathymetry to a significant degree so as to reduce the high fishery productivity of these areas. Any use, except archeological research, which would significantly adversely affect the usefulness of shipwrecks or artificial reef areas as a fish habitat is prohibited.

The proposed borrow areas are not identified as a Prime Fishing Areas, and while portions of groins will be buried by sand placement, no structures will be removed or altered. No shipwrecks, artificial reefs or other prime fishing structures will be impacted by the placement of sand. See information regarding shipwrecks and dredging below at N.J.A.C. 7:E-3.36 Historic and Archaeological Resources.

3. Historic and Archaeological Resources (N.J.A.C. 7:E-3.36)

Development that detracts from, encroaches upon, damages or destroys the value of historic or archaeological resources is discouraged.

The New Jersey Historic Preservation Office (HPO) is currently coordinating with the ACOE on this project under Section 106 of the National Historic Preservation Act. HPO's comments indicate that several resources eligible on or potentially eligible for inclusion in the National Register of Historic Places exist near the project, but will not be impacted by the sand placement project. These include: buildings near the sand placement areas (which will receive greater protection as the result of installation of the project); three magnetic targets within Borrow Area "M3" with shipwreck-like characteristics (Borrow Area "M3" has been removed from consideration as a sand borrow area); and two near shore targets (deeply buried in submerged sand placement locations and with characteristics not readily similar to potential shipwrecks).

Remaining are five targets or anomalies which may be shipwrecks eligible for inclusion in the National Register of Historic Places within the project's Area of Potential Effects. Based on treatment recommendations for these potential historic sites presented by the U.S. Army Corps of Engineers in a May 3, 2001 project letter and HPO's discussions with the ACOE's archaeologist, implementation of the following conditions will ensure avoidance of adverse effects to the five sites.

Conditions:

c) Anomaly I (in Sea Isle City) and Anomalies II and III (both in Ocean City) shall be monitored to assure their avoidance during sand installation in accordance with a monitoring plan to be developed by the U.S. Army Corps of Engineers (ACOE) which provides for their protection.

d) A plan for avoidance of Targets 21:82 and 45:63, both in Corson's Inlet Borrow Area, shall be developed and implemented by the ACOE which includes establishing an ample (ideally 1000 foot) buffer area around both Targets.

e) Both of the above detailed plans for avoidance and monitoring shall be submitted to the Historic Preservation Office for review and approval a minimum of six (6) months prior to the anticipated start of the first phase of the project to begin construction.

f) Prior to construction the ACOE, in cooperation with the Historic Preservation Office, shall develop Standard Operating Procedures for educating the contractors on target avoidance and beachfill monitoring.

4. Endangered or Threatened Wildlife Species Habitat (N.J.A.C. 7:7E-3.38)

Areas known to be inhabited on a seasonal or permanent basis by or to be critical at any stage in the life cycle of any wildlife or vegetation identified as "endangered" or "threatened" species on official Federal or State lists of endangered or threatened species or under active consideration for State or Federal listing, are considered Special Areas. Development of this area is prohibited unless it can be demonstrated that the endangered or threatened wildlife or vegetation species habitats would not directly or through secondary impacts on the relevant site or in the surrounding area be adversely affected.

The proposed dredge operation may potentially impact several species of sea turtles, particularly the loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, and leatherback sea turtle. The proposed dredge operation may potentially impact several species of marine mammals, particularly the right whale, humpback whale, finback whale, and harbor porpoise. The Feasibility Study indicates that monitoring for sea turtles and marina mammals will be conducted pursuant to the Biological Opinion (National Marine Fisheries Service, 1996)) in the event that a hopper dredged is used for this project.

With regard to species that occur on the project beaches, as of December 2005, the U.S. Fish & Wildlife Service, in cooperation with the ACOE and the NJ Endangered and Nongame Species Program (ENSP) finalized it's Biological Opinion in accordance with Section 7 of the Endangered Species Act of 1973, as amended (1 6 U.S.C. *1531 et seq.)*. This final programmatic Biological Opinion is entitled *Biological Assessment for Piping Plover and Seabeach Amaranth Resulting from Beach Nourishment Projects Along the New Jersey Coast (BA)*. The Integrated EIS makes reference to the draft Biological Opinion. On February 20, 2006 the ACOE, LUR, ENSP, the NJDEP Office of Engineering & Construction (OEC), the NJDEP Office of Natural Land Management, and the U.S. Fish and Wildlife Service (USFWS) met and agreed that the Biological Opinion would be implemented as described in the conditions below.

Corson's Inlet State Park and the Strathmere Natural Area historically been utilized by piping plovers, least tern, and black skimmers which are listed species that nest along the sandy beach areas. Piping plover have also nested in southern Sea Isle City. Since 2001 seabeach amaranth has been found to occur in Ocean City in the vicinity of 37th Street, in Corsons Inlet State Park, in Strathmere Natural Area, in Whale Beach, and in Sea Isle City in the vicinity of

23rd street to 26th street. In addition to agreements between the agencies to monitor and protect these plants, management is addressed by the conditions below. Monitoring and management of other State rare plant species is discussed below at N.J.A.C. 7:7E-3.40 Public open space.

Conditions:

g) State Aid Agreements shall require that prior to construction all barrier island municipalities within the project area are required to develop, formally adopt and implement a beach nesting bird and seabeach amaranth management plan, in cooperation with ENSP and the USFWS. Prior to construction, in order to have an acceptable interim plan in place, the communities may adopt the *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitats on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* found at Appendix B of the USFWS December 2005 Biological Assessment, in addition to the following conditions for Seabeach amaranth protection. The municipality shall manage the beaches in accordance with these guidelines and conditions until they develop and adopt a municipality specific plan.

h) The municipality shall be required by the Office of Engineering & Construction to contact the USFWS within 30 days of signing the State Aid Agreement, and to submit to ENSP & USFWS a proposed municipality-specific management plan within 6 months of signing the State Aid Agreement. The resource agencies have agreed to review the plans and coordinate with the municipalities to work out any problems with the plans so that they can approve the final draft management plan 18 months after the State Aid Agreement has been signed.

i) For portions of the beach nourishment project that have the potential to disturb nesting piping plovers / least terns / black skimmers, work is prohibited during the nesting season (approximately April 1 through September 1). This restriction does not apply to beaches that have not had nesting birds in the preceding 3-5 years. If birds begin to nest on those previously "non-nesting" sections during or immediately preceding construction, the ACOE shall work with USFWS and ENSP to insure that the birds are not adversely impacted by the construction activities.

j) Access easements negotiated with the private property owners or tidelands leaseholders by the ACOE, OEC, or the municipality, shall provide for the ENSP and / or USFWS the right of entry by staff or approved agents; the ability to monitor nesting activity; the erection of protective fencing and signs; the construction of predator exclosures; and the right to engage in other management activities as necessary.

k) Beach maintenance activities shall be conducted in accordance with the following Seabeach amaranth protection conditions until a municipality-specific plan is adopted:

i. Beach raking is prohibited from the landward limit of the beach berm (i.e., dune, seawall, bulkhead, boardwalk, commercial/residential structure) to the mean high water line from May 15 to December 1.

ii. Sand scraping or other mechanical manipulation of the beach is prohibited year round, except for emergency post-storm beach restoration performed in accordance with N.J.A.C. 7:7E-3A.3.

iii. Vehicle use is restricted to essential and emergency services, and to the area below the mean high-water line, between May 15 and December 1.

iv. In areas of high pedestrian traffic, string and post symbolic fencing shall be erected to route people away from the protective zones.

v. Limit vegetation planting and sand fencing to dune areas, allowing the upper beach to remain unstabilized and sparsely vegetated. Use only native species of vegetation.

vi. If a particular beach area is not identified on the protective zone list as described above, but is subsequently found to contain a threatened or endangered beach plant, the Department shall notify you and the management actions 1 through 5 above shall be followed at the newly identified area.

5. Sand and Gravel Extraction (N.J.A.C. 7:7E-4.2(l))

Sand extraction for beach nourishment is conditionally acceptable provided that Special Areas, as defined in the CZM rules, are not directly or indirectly degraded.

Provided that the conditions above at 1. Surf Clam Areas (N.J.A.C. 7:7E-3.3) is met, this project is acceptable pursuant to this rule.

6. Dunes (N.J.A.C. 7:7E-3.16), Standards for Beach And Dune Activities (N.J.A.C. 7:7E-3A.1 through .4), and Coastal Engineering (N.J.A.C. 7:7E-7.11(d))

The creation of dunes for the purpose of shore protection is strongly encouraged. Dune creation and maintenance includes the placement and/or repair of sand fencing (including wooden support posts), the planting and fertilization of appropriate dune vegetation, the maintenance and clearing of beach access pathways less than eight feet in width, and the construction or repair of approved dune walkover structures. The Department requires that all dune creation and maintenance activities be conducted in accordance with the specifications found in *Guidelines and Recommendations for Coastal Dune Restoration and Creation Projects* (DEP, 1985), and/*or Restoration of Sand Dunes Along the Mid-Atlantic Coast* (Soil Conservation Service, 1992).

Conditions:

l) New construction easements shall be obtained for any property within the project area, where a construction easement was previously obtained that restricts the height or width of the dune. These easements that were obtained prior to 1994 are inconsistent these NJ's Coastal Zone Management Rules with regard to dune management activities.

m) Once the project is constructed, in order for the municipalities to conduct routine beach and dune maintenance activities in the project area they must possess a Beach & Dune Maintenance Permit from the Land Use Regulation Division. All beach and dune maintenance activities shall be carried out in accordance with New Jersey's Standards for Beach And Dune Activities N.J.A.C. 7:7E-3A.1 through .4

7. Public open space (N.J.A.C. 7:7E-3.40)

Public open space constitutes land areas owned or maintained by State, Federal, county and municipal agencies or private groups (such as conservation organizations and homeowner's associations) and used for or dedicated to conservation of natural resources, public recreation, visual or physical public access or, wildlife protection or management. Public open space includes, lands held by the New Jersey Natural Lands Trust (N.J.S.A. 13:1B-15.119 et seq.) and lands designated Natural Areas (N.J.S.A. 13:1B-15.12a et seq.) within DEP-owned and managed lands. New or expanded public or private open space development is encouraged at locations compatible or supportive of adjacent and surrounding land uses. Development that adversely affects existing public open space is discouraged. Development within existing public open space is conditionally acceptable, provided that the development is consistent with the character and purpose of public open space, as described by the park master plan when such a plan exists.

The Feasibility Report indicates that the proposed berm and dune will extend 125 feet north of Seaview Avenue in Strathmere, and taper 734 feet into the Strathmere Natural Area. In accordance with the Natural Areas System Rules at N.J.A.C. 7:5A-1.9(e)11 this project was reviewed by the Natural Areas Council at its February 2, 2006 meeting. The Office of Natural Lands Management (ONLM) Council and staff recommendations were approved by memorandum by John S. Watson, Jr., Deputy Commissioner for Natural Resources on February 23, 2006, The approval memorandum contains, and the authorized work is subject to, the following conditions. The conditions apply to the Natural Areas unless otherwise specifically stated.

Conditions:

n) The ACOE will coordinate with the ONLM on measures to ensure the protection/reestablishment of endangered and rare plant species (seabeach amaranth, Amaranth pumilus; seabeach evening primrose, Oenothera humifusa; seaside sandwort, Honckenya peploides.

o) Ongoing surveys and monitoring of the three rare plant species throughout the project area will be performed before and after construction, and will be funded by the ACOE and/or with the assistance of ACOE staff.

p) Local seed sources will be used for plantings of American beachgrass and seaside panicum.

q) The ACOE will coordinate with the ONLM and ENSP on the placement and type of fencing to be used for the piping plover and rare plant exclusion areas.

r) A program will be developed for the propagation of seabeach amaranth and other rare plants using local seed sources, in addition to monitoring the efficacy of transplanting efforts.

s) Photographic documentation of the piling and revetment structures are required before and during removal, to show structure, location and history. This will be performed by the ACOE.

t) Prior to construction the ACOE will provide Natural Areas staff with a copy of the project plan, and inform staff of planned meetings.

u) The ENSP will conduct or coordinate surveys for the Northeastern beach tiger beetle (Cicindela dorsalis dorsalis) using funding from ACOE.

8. Secondary Impacts (N.J.A.C. 7:7E-6.3)

Secondary impacts are the effects of additional development likely to be constructed as a result of the approval of a particular proposal. Secondary impacts can also include increased recreational demand and an other offsite impacts generated by onsite activities, which affect the site and surrounding region. Coastal development that induces further development shall demonstrate, to the maximum extent practicable, that the secondary impacts of the development will satisfy the Rules on Coastal Zone Management. The level of detail and areas of emphasis of the secondary impact analysis are expected to vary depending upon the type of development.

Secondary impact analysis must include an analysis of the likely geographic extent of induced development, its relationship to the State Development and Redevelopment Plan and the CAFRA Planning Map as defined at N.J.A.C. 7:7E-5.2. The analysis must include an assessment of likely induced point and non-point air and water quality impacts, and evaluation of the induced development in terms of all applicable Coastal Zone Management Rules.

The Whale Beach section of Ludlam Island is an environmentally sensitive planning area, and due to the unstable nature of the area it has remained the least developed barrier island area in New Jersey, with the exception of State Park lands. The majority of this area is also designated a V-Zone by the Federal Emergency Management Agency. Pursuant to New Jersey's Coastal Zone Management Rules, residential development is prohibited in V-Zones. This proposed beach nourishment improvement project has the potential to induce development in this area, including development of nearby wetlands, wetland buffers, over wash areas, flood hazard and coastal high hazard areas, endangered or threatened wildlife or vegetation species habitats, and critical wildlife habitats. The selected plan entails construction of a beach and dune template in this area that has the same profile as heavily developed portions of Ludlam Island.

Historically, the NJDEP has refused to allow extension of sewer service in Whale Beach because it would also induce development on lots that are currently undersized for septic systems. To limit potential development, to avoid repetitive loss associated with storm events, and to protect valuable wildlife habitat and open space, agencies within the DEP and county and Federal agencies have already partnered to purchase the following properties in Whale Beach. Block 11.02, lot 15, Sea Isle, - 0.17 acre @ $189,000.00, Block 834, lot 12, Upper Twp. - 0.18 acre @ $100,000, Block 798, lot 19, Upper Twp. - 0.3 acre @ $76,000.00, Riordan properties - multiple blocks & lots, Upper Twp. - 36.5 acres @ $500,000.00.

In order to address LUR's concern of induced development related to the Federal project, and with a goal of obtaining a positive Coastal Zone Management Consistency Determination OEC has already dedicated $2,420,000 (FY 2004) for additional land acquisition. By memorandum dated March 29, 2005 OEC presented LUR with a funding proposal for an additional $10,000,000 for property acquisition in Whale Beach after the initial $2,420,000 is exhausted. The memo and dedicated funding source has allowed DEP to begin development of a comprehensive plan for acquisition and management, including identification of lots where there are opportunities to increase public access parking and to install restroom facilities to support this project. From the original $2,420000 dedication DEP purchased Block 791, Lot 2, Upper Twp. - 0.11 acre @ $220,000.00.

The Green Acres Program has mailed applications for offers for sale to all of the owners of private vacant land in Whale Beach and a number of their inquires have generated interest for sale. They are currently processing applications for offers for sale on the following properties, with the first two being in the appraisal process: Block 791, Lot 5, Block 811, Lot 1, Block 788, Lots 1-16, and Block 791, Lots 47 and 48.

In addition, both Upper Township and Sea Isle City have acquired a number of vacant parcels in Whale Beach for preservation. Both municipalities have partnered with New Jersey's Green Acres Program to acquire open space or to enhance recreation areas and both municipalities open space inventories include beach tracks.

Conditions:

v) OEC shall fulfill its commitment to provide the dedicated funding to acquire properties in Whale Beach, and to install parking and restroom facilities where possible. This includes continued coordination with the Green Acres Program and LUR.

9. Public Access to the *Waterfront (N.J.A.C. 7:7E-8.11) and Coastal Engineering (N.J.A.C. 7:7E-7.11)*

Public access, including parking where appropriate must be provided to beaches nourished by public funds. Section (b) 11 of N.J.A.C. 7:7E-8.11 states that the Department may require some or all of the public access portion of a site to be dedicated for public use through measures such as a conservation restriction.

The ACOE identifies existing adequate public access locations and parking in much of the project area at 6.3.1.1.1 of the Feasibility Report. In Whale Beach parking is only available along the County road, Commonwealth Avenue. Parking on the west side of this road is limited due to driveways associated with the residential properties. Safety of visitors when accessing their cars directly on the main road is a concern. However, in order to provide adequate parking within this segment of the project OEC has dedicated funding to acquire lots to prevent new residential developments, and some of those purchased lots can potentially be used for off street parking and seasonal restroom facilities. OEC has also committed to ensure that rest room facilities will be provided every half-mile along the project area in each segment as it is constructed, and to comply with any future CZM requirements for restrooms that may be adopted.

Conditions:

w) Prior to construction the Local Sponsor, OEC, must ensure that conservation easements are obtained for the beach accessways, as well as the beach easements, and that they are accurately recorded.

x) State Aid Agreements between OEC and the municipalities must ensure that existing parking areas are maintained in perpetuity by preventing the municipalities from adopting parking ordinance that eliminate safe, historically used public on-street parking spaces or areas. The agreements must ensure that the municipalities record conservation restrictions to preserve public access parking lots at waterfront locations. Also, the agreements must ensure that the City will post appropriate public access signs.

y) State Aid Agreements between OEC and the municipalities must ensure that at a minimum the municipalities continue to provides the toilet facilities at the existing locations and every half mile or more where feasible and needed.

If the Army Corps of Engineers does not agree to the conditions of the Federal Consistency Determination, this conditional concurrence is treated as an objection. Pursuant to Section 930, Subpart H of the Federal Coastal Zone Management Act the Army Corps of Engineers may appeal the State agency decision. See section 930.120 through 930.131 of 15 CFR for Federal appeal procedures.

LURP File No. 0103-04-0028.1 CDT 040001

If you have any questions regarding this letter, please do not hesitate to contact John Policarpo of my staff me at (609) 984-3444.

Sincerely,

Kevin J. Broderick
Manager, Bureau of Coastal Regulation

2/27/2006
Date

C: Dean Jablonski, DAG, Division of Law
Lisa Daglis, DAG, Division of Law
Daniel Caprioli, U.S. ACOE, Philadelphia District
Kathleen Cann, NJDEP Bureau of Coastal & Land Use Compliance & Enforcement
Robert Cartica, NJDEP Office of Natural Lands Management
Jeff Normant, NJDEP Bureau of Shellfisheries
Dave Jenkins, NJDEP Endangered & Non-Game Species Program
Wendy Walsh, USFWS, Pleasantville Office

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Land Use Regulation
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JON S. CORZINE
Governor

MARK N. MAURIELLO
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JUN 25 2009

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100 Penn Square East
Philadelphia, Pennsylvania 19107-3391

David Rosenblatt
New Jersey Department of Environmental Protection
Office of Engineering & Construction
501 East State Street
Trenton, NJ 08625

RE: Modification to Great Egg Harbor Inlet to Townsends Inlet Authorization
Feasibility Report & Integrated Environmental Impact Statement
Federal Consistency Determination and Section 401 Water Quality Certification
Land Use Regulation File No. 0500-02-0001.1 CDT 090001

Dear Mr. Arabatzis and Mr. Rosenblatt:

The New Jersey Department of Environmental Protection, Division of Land Use Regulation, acting under Section 307 of the Federal Coastal Zone Management Act (P.L. 92-583) as amended, has reviewed your January 12, 2009 and subsequent May 14, 2009 requests for a consistency determination to perform interim beach nourishment in the Township of Upper and the City of Sea Isle City, Cape May County, in lieu of available Federal funding. Based on submitted information, including electronic submissions from Jeff Normant on September 23, 2008, Todd Pover on October 10 and 23, 2008 and from Vincent Maresca on October 07, 2008 and May 14, 2009 (SHPO concurrence memo) the Division has determined that the revised beach nourishment, protective berm and beach extension construction plan is consistent with New Jersey's Coastal Zone Management Rules N.J.A.C. 7:7E-1.1 et seq , as amended to April 7, 2008 and the applicable Rules guiding issuance of a Section 401 Water Quality Certificate, **provided that the conditions discussed below are met to the satisfaction of the Department of Environmental Protection.**

Project Description

The Division of Land Use Regulation is authorizing modification to the Federal project to include the expansion of the C1 borrow area and widening of a portion of the beach berm as outlined below. All other aspects of the Federal project will remain the same, as approved in the February 27, 2006 authorization.

Due to a lack of Federal funding, the Bureau of Coastal Engineering (BCE) is requesting authorization to perform beach nourishment in the Township of Upper and the City of Sea Isle City, Cape May County, as an interim shore protection measure given the extreme erosion at the north end of the Ludlam Island portion of the Great Egg Harbor to Townsends Inlet Storm Damage Reduction Project. Project plans have been received from both municipalities, titled 2008 Strathmere Beachfill, as prepared by Upper Township Engineer Paul Dietrich on December 01, 2008, last revised in May 11, 2009, and Proposed City of Sea Isle City Beachfill, as prepared by Sea Isle City Engineer Andrew Previti on January 06, 2009. These plans detail modifications to the proposal outlined and authorized in the previous Federal Consistency Determination issued on February 27, 2006.

The plans call for a 100-foot berm at elevation 6.75 feet NAVD 1988 in Upper Township and 7.0 feet NAVD 1988 in Sea Isle City from which the beach will extend at a 30:1 slope down to the seaward toe of the fill. The fill material will be obtained from an offshore borrow source identified as "C1". In addition, the plans call for the following modifications to the previously approved Federal project in response to extreme erosion at the north end of Strathmere, including:

1. Enlarge the existing C1 borrow area on average approximately 750 feet to the northeast (see C1-Ex-A through C1-Ex-D on Strathmere plan sheet 6 of 8), providing 45.8 acres of additional area and increase the maximum dredge depth of C1-A to 20 feet NAVD (which includes a 1 foot over-dredge allowance).

2. In crease the beach berm width to approximately 600 linear feet for approximately 1,000 linear feet from Winthrop Avenue heading north and east of Neptune Avenue.

These modifications will reorient the main channel of Corson's Inlet back to the northeast, reducing erosion pressure on Strathmere and providing a feeder beach to the Natural Area.

The plans call for approximately 9,300 linear feet of beach fill in the Strathmere and Whale Beach sections of Upper Township, within which approximately 891,000 cubic yards of sand will be placed. Sea Isle City will place approximately 7,400 linear feet of beach fill in two sections: from 1st Street to 15th Street and from 40th Street to 52nd Street, within which approximately 395,000 cubic yards of sand will be placed.

This proposal is within the footprint of the original Federal proposal and is keeping with the intended shore protection benefit to target communities within the Great Egg Harbor to Townsends Inlet project. This authorization renews the Federal Consistency Determination and Section 401 Water Quality Certificate to include the modifications described above and authorizes the interim BCE proposal to construct a subsection of the original, larger proposal to treat extreme erosion. Otherwise, the project remains the same as was outlined I the 2006 version of this approval.

The following discussion includes an evaluation of project compliance with New Jersey's Coastal Zone Management Rules (N.J.A.C. 7:7E-1.1 et seq.), and identifies the conditions under which the project is found consistent with the rules. This consistency determination is issued subject to compliance with these specific conditions.

1. Surf Clam Areas (N.J.A.C. 7:7E-3.3)

Surf Clam Areas are waters within which can be demonstrated to support significant commercially harvestable quantities of surf clams or areas important to the recruitment of surf clam stocks. Development that would result in the destruction, condemnation, or contamination of surf clam areas is prohibited, except sand and gravel mining to obtain material for beach nourishment. This is only acceptable when the beach nourishment project is in the public interest and there are no prudent and feasible alternative offshore borrow site that would result in less impact to marine fish and fisheries. In addition, impacts to surf clam areas are minimized by designing the beach nourishment project to minimize the volume of sand borrowed from the surf clam area and the borrow cut is designed to minimize the area disturbed, for example, by designing a deeper cut. The borrow site must be located to avoid those more productive surf clam areas and when appropriate, notice shall be provided to clammers in advance of the mining operation to allow for surf clam harvest. Sand mining is not acceptable within a surf clam conservation area as defined at N.J.A.C. 7:25-12.

Based on the information provided and prior coordination with the NJDEP Bureau of Shellfisheries (BSF), there are no issues with regard to surf clam areas. BSF concurs with the choice of the proposed borrow area in the selected plan, identified as "C1" and encourages its use. Borrow area C1 is a previously approved borrow area as per Permit File No. 0511-00-0012.3 and 0511-00-0012.4 and has been utilized in the past.

2. Prime Fishing Areas (N.J.A.C.7:7E-3.4) & Shipwrecks and Artificial Reefs (N.J.A.C. 7:7E-3.13)

Prime fishing areas include tidal water areas and water's edge areas, which have a demonstrable history of supporting a significant local quantity of recreational or commercial fishing activity. The area includes all coastal jetties and groins, public fishing piers or docks and artificial reefs. Prohibited uses include sand or gravel submarine mining which would alter existing bathymetry to a significant degree so as to reduce the high fishery productivity of these areas. Any use, except archeological research, which would significantly adversely affect the usefulness of shipwrecks or artificial reef areas as a fish habitat is prohibited.

The proposed borrow area is not identified as Prime Fishing Areas. No shipwrecks, artificial reefs or other prime fishing structures will be impacted by the placement of sand. See information regarding shipwrecks and dredging below at N.J.A.C. 7:E-3.36 Historic and Archaeological Resources.

3. Historic and Archaeological Resources (N.J.A.C. 7:E-3.36)

Development that detracts from, encroaches upon, damages or destroys the value of historic or archaeological resources is discouraged.

The New Jersey Historic Preservation Office (HPO) concurs that the plan coordinated with the ACOE on this project under Section 106 of the National Historic Preservation Act for avoidance of Targets 21:82 and 45:63 in Corson's Inlet Borrow Area, satisfies N.J.A.C. 7:E-3.36 of the Federal Consistency Determination. For Target 21:82, the plan calls for a 200 foot buffer radius in which no dredging or navigation can occur and a 500 foot buffer radius within which no dredging will occur. For Target 45:63, the plan calls for a 100 foot buffer radius in which

no dredging or navigation can occur and a 400 foot buffer radius within which no dredging will occur.

Two additional Targets 5:43 and 8:30 were previously identified not to be submerged cultural resources and therefore no additional archaeological investigation is needed.

Conditions:

- **Prior to construction the applicant shall administer existing procedures for educating the contractors on target avoidance and beachfill monitoring, as developed by the USACE in September of 2004.**

4. Endangered or Threatened Wildlife Species Habitat (N.J.A.C. 7:7E-3.38)

Areas known to be inhabited on a seasonal or permanent basis by or to be critical at any stage in the life cycle of any wildlife or vegetation identified as "endangered" or "threatened" species on official Federal or State lists of endangered or threatened species or under active consideration for State or Federal listing, are considered Special Areas. Development of this area is prohibited unless it can be demonstrated that the endangered or threatened wildlife or vegetation species habitats would not directly or through secondary impacts on the relevant site or in the surrounding area be adversely affected.

With regard to species that occur on the project beaches, as of December 2005, the U.S. Fish & Wildlife Service, in cooperation with the ACOE and the NJ Endangered and Nongame Species Program (ENSP) finalized it's Biological Opinion in accordance with Section 7 of the Endangered Species Act of 1973, as amended (1 6 U.S.C. *1531 et seq.)*. This final programmatic Biological Opinion is entitled *Biological Assessment for Piping Plover and Seabeach Amaranth Resulting from Beach Nourishment Projects Along the New Jersey Coast (BA).* The previously reviewed Integrated EIS makes reference to the draft Biological Opinion. On February 20, 2006 the ACOE, LUR, ENSP, the NJDEP Office of Engineering & Construction (OEC), the NJDEP Office of Natural Land Management, and the U.S. Fish and Wildlife Service (USFWS) met and agreed that the Biological Opinion would be implemented as described in the conditions below.

The proposed beach fill is located in Upper Township and the City of Sea Isle City. The Strathmere Natural Area historically has been utilized by piping plovers, least tern, and black skimmers which are listed species that nest along the sandy beach areas. Piping plover have also nested in southern Sea Isle City. Since 2001 seabeach amaranth has been found to occur in Ocean City in the vicinity of 37th Street, in Corsons Inlet State Park, in Strathmere Natural Area, in Whale Beach, and in Sea Isle City in the vicinity of 23rd street to 26th street. Any impacts to these species must be in compliance with the conditions set-forth below. Monitoring and management of other State rare plant species is discussed below at N.J.A.C. 7:7E-3.40 Public open space.

Conditions:

- **State Aid Agreements shall require that prior to construction all barrier island municipalities within the project area are required to develop, formally adopt and implement a beach nesting bird and seabeach amaranth management plan, in cooperation with ENSP and the USFWS. Prior to construction, in order to have an acceptable interim plan in place, the communities may adopt the *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitats on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* found at**

Appendix B of the USFWS December 2005 Biological Assessment, in addition to the following conditions for Seabeach amaranth protection. The municipality shall manage the beaches in accordance with these guidelines and conditions until they develop and adopt a municipality specific plan.

- **The municipality shall be required by the Office of Engineering & Construction to contact the USFWS within 30 days of signing the State Aid Agreement, and to submit to ENSP & USFWS a proposed municipality-specific management plan within 6 months of signing the State Aid Agreement. The resource agencies have agreed to review the plans and coordinate with the municipalities to work out any problems with the plans so that they can approve the final draft management plan 18 months after the State Aid Agreement has been signed.**

- **For portions of the beach nourishment project that have the potential to disturb nesting piping plovers / least terns / black skimmers, work is prohibited during the nesting season (approximately March 15 through August 15). This restriction does not apply to beaches that have not had nesting birds in the preceding 3-5 years. If birds begin to nest on those previously "non-nesting" sections during or immediately preceding construction, the applicant shall work with USFWS and ENSP to insure that the birds are not adversely impacted by the construction activities.**

- **Beach maintenance activities shall be conducted in accordance with the following Seabeach amaranth protection conditions until a municipality-specific plan is adopted:**

  i. Beach raking is prohibited from the landward limit of the beach berm (i.e., dune, seawall, bulkhead, boardwalk, commercial/residential structure) to the mean high water line from May 15 to December 1.

  ii. Sand scraping or other mechanical manipulation of the beach is prohibited year round, except for emergency post-storm beach restoration performed in accordance with N.J.A.C. 7:7E-3A.3.

  iii. Vehicle use is restricted to essential and emergency services, and to the area below the mean high-water line, between May 15 and December 1.

  iv. In areas of high pedestrian traffic, string and post symbolic fencing shall be erected to route people away from the protective zones.

  v. Limit vegetation planting and sand fencing to dune areas, allowing the upper beach to remain unstabilized and sparsely vegetated. Use only native species of vegetation.

  vi. If a particular beach area is not identified on the protective zone list as described above, but is subsequently found to contain a threatened or endangered beach plant, the Department shall notify you and the management actions 1 through 5 above shall be followed at the newly identified area.

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Sand extraction for beach nourishment is conditionally acceptable provided that Special Areas, as defined in the CZM rules, are not directly or indirectly degraded.

Provided that the conditions above at 1. Surf Clam Areas (N.J.A.C. 7:7E-3.3) is met, this project is acceptable pursuant to this rule.

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The creation of dunes for the purpose of shore protection is strongly encouraged. Dune creation and maintenance includes the placement and/or repair of sand fencing (including wooden support posts), the planting and fertilization of appropriate dune vegetation, the maintenance and clearing of beach access pathways less than eight feet in width, and the construction or repair of approved dune walkover structures. The Department requires that all dune creation and maintenance activities be conducted in accordance with the specifications found in *Guidelines and Recommendations for Coastal Dune Restoration and Creation Projects* (DEP, 1985), and/*or Restoration of Sand Dunes Along the Mid-Atlantic Coast* (Soil Conservation Service, 1992).

Conditions:

- **The Office of Engineering and Construction must require easements for every property in which work will take place. The OEC shall use the new perpetual easement which was drafted and approved by the Office of the Attorney General for the State of New Jersey.**

- **Once the project is constructed, in order for the municipalities to conduct routine beach and dune maintenance activities in the project area they must possess a Beach & Dune Maintenance Permit from the Division of Land Use Regulation. All beach and dune maintenance activities shall be carried out in accordance with New Jersey's Standards for Beach And Dune Activities N.J.A.C. 7:7E-3A.1 through .4**

7. Public open space (N.J.A.C. 7:7E-3.40)

Public open space constitutes land areas owned or maintained by State, Federal, county and municipal agencies or private groups (such as conservation organizations and homeowner's associations) and used for or dedicated to conservation of natural resources, public recreation, visual or physical public access or, wildlife protection or management. Public open space includes, lands held by the New Jersey Natural Lands Trust (N.J.S.A. 13:1B-15.119 et seq.) and lands designated as state Natural Areas (N.J.S.A. 13:1B-15.4 et seq. and N.J.S.A. 13:1B-15.12a et seq.) within DEP-owned and managed lands. New or expanded public or private open space development is encouraged at locations compatible or supportive of adjacent and surrounding land uses. Development that adversely affects existing public open space is discouraged. Development within existing public open space is conditionally acceptable, provided that the development is consistent with the character and purpose of public open space, as described by the park master plan when such a plan exists.

The Feasibility Report indicates that the proposed beachfill project will extend into the Strathmere Natural Area. In accordance with the Natural Areas System Rules at N.J.A.C. 7:5A-1.9(e)12 this project was reviewed by the Natural Areas Council at its December 19, 2008 meeting. At this meeting, Council and staff voted in favor of the beachfill project in accordance with the

recommendation of staff of the Office of Natural Lands Management (ONLM). The Council recommended the project be approved by the Assistant Commissioner for Natural and Historic Resources as follows (from draft meeting minutes):

> The current proposal from the Bureau of Coastal Engineering should be approved as an intermediate solution to erosion and habitat restoration at the Strathmere Natural Area, pending a longer-term solution requiring Federal appropriation; the Council must be consulted before any future construction in the Strathmere Natural Area (including ONLM staff consultation for emergency measure) especially considering that so few natural inlets remain in NJ; acquisition of developed properties should be a priority in the future in order to move development away from precarious coastal habitats; and the Department is advised to develop a long-term vision to address coastal processes and climate change, and that this vision be built into natural area management plans.

The specific conditions listed below will apply to future construction beyond 2009, provided that there is sufficient habitat for the species in question. However, in light of the current eroded state of the Natural Area, these conditions do not apply to the planned 2009 beach nourishment and associated construction.

Conditions:

- **The ACOE will coordinate with the ONLM on measures to ensure the protection of endangered and rare plant species, such as, seabeach amaranth, (*Amaranthus pumilus*); seabeach evening primrose (*Oenothera humifusa*); and seaside sandwort (*Honckenya peploides*).**

- **A survey of rare and endangered plant species throughout the Natural Area will be performed before construction, and will be funded by the ACOE and/or with the assistance of ACOE staff. The plant(s) will be identified and delineated in the project plans, as well as flagged in the field, so that any damage can be avoided.**

- **Project specifications will require that the contractor procure plant materials from growers who utilize local seed sources for plantings of American beachgrass and seaside panicum.**

- **The Bureau of Coastal Engineering will coordinate with the ONLM and ENSP on the placement and type of fencing to be used for the piping plover and rare plant exclusion areas.**

- **A program will be developed for the propagation of seabeach amaranth and other rare plants using local seed sources, in addition to monitoring the efficacy of transplanting efforts.**

- **If removal of existing timber groin(s) is proposed, then photographic documentation of the piling structures is required before and during removal, to show structure, location and history. This will be performed by the ACOE.**

- **Prior to construction the Bureau of Coastal Engineering will provide Natural Areas staff with a copy of the project plan, and inform staff of public meetings.**

8. Secondary Impacts (N.J.A.C. 7:7E-6.3)

Secondary impacts are the effects of additional development likely to be constructed as a result of the approval of a particular proposal. Secondary impacts can also include increased recreational demand and an other offsite impacts generated by onsite activities, which affect the site and surrounding region. Coastal development that induces further development shall demonstrate, to the maximum extent practicable, that the secondary impacts of the development will satisfy the Rules on Coastal Zone Management. The level of detail and areas of emphasis of the secondary impact analysis are expected to vary depending upon the type of development.

Secondary impact analysis must include an analysis of the likely geographic extent of induced development, its relationship to the State Development and Redevelopment Plan and the CAFRA Planning Map as defined at N.J.A.C. 7:7E-5.2. The analysis must include an assessment of likely induced point and non-point air and water quality impacts, and evaluation of the induced development in terms of all applicable Coastal Zone Management Rules.

The Whale Beach section of Ludlam Island is an environmentally sensitive planning area, and due to the unstable nature of the area it has remained the least developed barrier island area in New Jersey, with the exception of State Park lands. The majority of this area is also designated a V-Zone by the Federal Emergency Management Agency. Pursuant to New Jersey's Coastal Zone Management Rules, residential development is prohibited in V-Zones. This proposed beach nourishment improvement project has the potential to induce development in this area, including development of nearby wetlands, wetland buffers, over wash areas, flood hazard and coastal high hazard areas, endangered or threatened wildlife or vegetation species habitats, and critical wildlife habitats. The selected plan entails construction of a beach and dune template in this area that has the same profile as heavily developed portions of Ludlam Island.

Historically, the NJDEP has refused to allow extension of sewer service in Whale Beach because it would also induce development on lots that are currently undersized for septic systems. To limit potential development, to avoid repetitive loss associated with storm events, and to protect valuable wildlife habitat and open space, the Green Acres Program is currently acquiring properties from willing sellers within the project area with funding from the Shore Protection Fund.

Conditions:

- **OEC shall coordinate with the Green Acres Program and the Division of Land Use Regulation to work toward property acquisition in Whale Beach when funding becomes available.**

9. Public trust rights (N.J.A.C. 7:7E-8.11) and Coastal Engineering (N.J.A.C. 7:7E-7.11)

Public access must be provided to beaches nourished by public funds. This project must comply with Section (p) of N.J.A.C. 7:7E-8.11.

Conditions:

- **Prior to construction the Local Sponsor, OEC, must ensure that conservation easements are obtained for the beach access ways, as well as the beach easements, and that they are accurately recorded.**

- **In accordance with Superior Court of New Jersey Appellate Division's Order on Motion dated May 20, 2004, the Boroughs cannot limit vertical or horizontal public access to its dry sand beach area nor interfere with the public' s right to free use of the dry sand for intermittent recreational purposes connected with the ocean and wet sand. However, the Boroughs may charge a fee to those members of the public who remain upon and use its beach for an extended period providing it cleans the beach, picks up trash regularly, and permits use of its shower facilities if provided. The Boroughs must also provide customary lifeguard services for members of the public who use the ocean areas up to the high water mark regardless of whether they are just passing through or remaining on the beach area of their property.**

If the Army Corps of Engineers does not agree to the conditions of the Federal Consistency Determination, this conditional concurrence is treated as an objection. Pursuant to Section 930, Subpart H of the Federal Coastal Zone Management Act the Army Corps of Engineers may appeal the State agency decision. See section 930.120 through 930.131 of 15 CFR for Federal appeal procedures.

If you have any questions regarding this letter, please do not hesitate to contact me at (609) 633-2289.

Sincerely,

R. Langbein 6/25/09

Richard Langbein
Manager, Bureau of Coastal Regulation

C: Dwight Pakan, U.S. ACOE, Philadelphia District
NJDEP Bureau of Coastal & Land Use Compliance & Enforcement
Vincent Maresca, NJDEP Historic Preservation Office
Jeff Normant, NJDEP Bureau of Shellfisheries
Todd Pover, NJDEP Endangered & Non-Game Species Program

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

NOV - 6 2012

Steven Allen
Environmental Resources Branch
Department of the Army
Philadelphia District, Corps of Engineers
Wanamaker Building, 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390

Dear Mr. Allen,

This is in response to your e-mail dated October 22, 2012, and other correspondence related to the U.S. Army Corps of Engineers' proposed Great Egg Harbor Inlet to Townsend Inlet Storm Damage reduction Project. You are in the planning phase for this project and are preparing a Limited Re-evaluation Report and working on a Project Partnership Agreement (PPA) with the New Jersey Department of Environmental Protection. Once the PPA is executed, the project will become eligible to receive construction funds. When undertaken, this project will involve using beachfill from three offshore sand borrow areas, as well as Corson Inlet to construct berms and dunes to provide storm protection. Sand will be placed along approximately 15 miles of beach in southern New Jersey. Initial sand quantity is estimated at 5,146,000 cubic yards (cy). Periodic nourishment of 1,820,000 cy of sand may occur every five years. Construction, including offshore dredging, will not begin for at least two years.

It is our understanding that once the PPA is executed, you will begin to finalize project plans. At that time, you will develop a Biological Assessment and request a consultation, pursuant to section 7 of the ESA. As noted in your e-mail, by continuing to work on project planning and by entering the PPA, you are not making any irretrievable or irreversible commitments of resources and will not do so until any necessary section 7 consultation is complete. We have no objections to your continuing to work on project planning and agree that because project plans have not been fully developed, it would be premature to initiate section 7 consultation.

My staff looks forward to continuing to work cooperatively with you as this project moves forward. Should you have any questions regarding this correspondence, please contact Julie Crocker of my staff at (978)282-8480 or by e-mail (Julie.Crocker@noaa.gov).

Sincerely,

Kimberly Damon-Randall
Acting Assistant Regional Administrator
for Protected Resources

EC: Greene, F/NER4
Crocker, F/NER3

File Code: Sec 7 ACOE NAP Great Egg to Townsend Inlet

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO ATTENTION OF

Environmental Resources Branch

FEB 21 2013

Ms. Kimberly Damon-Randall
Acting Assistant Regional Administrator for Protected Resources
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear Ms. Damon-Randall:

The Philadelphia District is requesting re-initiation of formal consultation with the National Marine Fisheries Service (NMFS) as specified in 50 CFR Part 402.14(c) under Section 7 of the Endangered Species Act. Formal consultation is requested for the Philadelphia District's Federal beach nourishment activities along the Atlantic coast of New Jersey and Delaware with regard to potential impacts to the Federally listed Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) which occur, or have the potential of occurring, within the boundaries of these projects. The National Marine Fisheries Service's February 6, 2012 Federal Register notice listed five distinct population segments (DPSs) as either Federally threatened or endangered. The New York Bight DPS includes the southern coast of New Jersey and Delaware. The NMFS has listed the New York Bight DPS as endangered. The listing officially became effective on April 6, 2012.

Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, Federal agencies are required to coordinate with the NMFS when an agency action may affect a listed species or their critical habitat. The Corps' Federal beach nourishment projects have the potential to affect the Atlantic sturgeon. This letter serves to notify NMFS that the Philadelphia District is preparing a Programmatic Biological Assessment on the Federally listed Atlantic sturgeon which occurs within the boundaries of the above referenced projects. A copy of the completed Biological Assessment will be forwarded to your office once it is completed. The assessment will address potential impacts to the Atlantic sturgeon and other listed species as well as update project details that have changed since the previous BA was completed for these projects in 1995.

The Corps has prepared a Memorandum For The Record (see enclosure) that has concluded that allowing the District's beach nourishment program to continue to operate during the reinitiation period will not violate section 7(a)(2) or 7(d). The Corps recognizes that this 7(a)(2) determination is only applicable during the reinitiation period and does not address the Corps' longer term obligation to ensure the action is not likely to jeopardize the continued existence of listed species.

If you have any questions or require further information, please contact Ms. Beth Brandreth (215-656-6558) of our Environmental Resources Branch. We appreciate your office's continued support and assistance with this matter.

Sincerely,

C. MacIntosh

Charles P. MacIntosh
Acting Chief, Planning Division

Enclosure

Cc: Julie Crocker, NMFS
Christine Vaccaro, NMFS
Karen Greene, NMFS, Sandy Hook

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO ATTENTION OF

FEB 21 2013

MEMORANDUM FOR: The Record

FROM: Charles MacIntosh
Acting Chief, Planning Division

SUBJECT: Reinitiating Section 7 Consultation for Beach Nourishment Projects due to the listing of the Atlantic sturgeon

The US Army Corps of Engineers (Corps), Philadelphia District has an on-going beach nourishment program along the Atlantic Coast of New Jersey and Delaware for the purpose of storm damage reduction. The Corps has previously completed formal consultation on these and other projects throughout the District pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended. Specifically, in September 1995, the Philadelphia District initiated formal consultation under the Endangered Species Act with regard to potential impacts associated with dredging projects permitted, funded or conducted by the Philadelphia District. "A Biological Assessment of Federally Listed Threatened and Endangered Species of Sea Turtles, Whales, and the Shortnose Sturgeon within Philadelphia District Boundaries: Potential Impacts of Dredging Activities" was forwarded to NMFS for their review. A Biological Opinion was issued by NMFS on November 26, 1996 (NMFS, 1996) for all dredging projects carried out by the District. The Opinion stated that dredging projects within the Philadelphia District may adversely affect sea turtles and shortnose sturgeon, but are not likely to jeopardize the continued existence of any threatened or endangered species under the jurisdiction of NMFS. For projects within the Philadelphia District, the anticipated incidental take by injury or mortality is three (3) shortnose sturgeon. This Opinion was amended with a revised Incidental Take Statement (ITS) on May 25, 1999.

On October 6, 2010, NMFS published a Notice in the Federal Register proposing to list three Distinct Population Segments (DPSs) of Atlantic sturgeon in the Northeast Region of NMFS. The New York Bight Distinct Population Segment, which includes all Atlantic sturgeon whose range occurs in watersheds that drain into coastal waters, including Long Island Sound, the New York Bight, and the Delaware Bay, from Chatham, MA to the Delaware-Maryland border on Fenwick Island, as well as wherever these fish occur in coastal bays, estuaries, and the marine environment from Bay of Fundy, Canada, to the Saint Johns River, FL, was proposed for listing as endangered. On February 6, 2012, NMFS issued two final rules (77FR 5880 and 77 FR 5914) listing five DPSs of Atlantic sturgeon as threatened or endangered under the ESA. The effective date of the listing was April 6, 2012. In response to this listing, the Corps participated in a conference call with NMFS to discuss the listing and the potential impact of the listing on on-going Corps projects. In subsequent discussions, the Corps and NMFS agreed that an

updated Biological Assessment would be completed to address potential impacts to the Atlantic sturgeon for all the District's dredging projects.

The purpose of this memorandum is to reinitiate consultation on the District's beach nourishment projects and to document the determination that allowing the beach nourishment projects to continue during the reinitiation period will not violate ESA sections 7(a)(2) and 7(d). Absent any unforeseen circumstances, we expect the reinitiation period to extend until approximately December 31, 2013. At the end of the reinitiation period, the Corps will replace the 1995 Biological Assessment with a new assessment that will analyze the effects of the beachfills along the Atlantic of New Jersey and Delaware on listed species, including the newly listed species of Atlantic sturgeon, and consider more recent information on sea turtles and other species that has become available since the 1996 Biological Opinion was completed.

Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may not have been previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. As indicated below, the Corps and NMFS have determined that formal Section 7 consultation on the District's beach nourishment projects must be reinitiated due to the new listing of the Atlantic sturgeon Distinct Population Segments (DPSs).

The Atlantic sturgeon population has been divided into 5 distinct population segments (DPSs) (Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic). These DPSs were configured to account for the marked difference in physical, genetic, and physiological factors within the species, as well as the unique ecological settings and unique genetic characteristics that would leave a significant gap in the range of the taxon if one of them were to become extinct (ASSRT, 2007). On February 6, 2012, the Northeast Region of NMFS listed the Gulf of Maine population as threatened and the New York Bight (NYB) and Chesapeake Bay (CB) DPSs as endangered. The Philadelphia District's Atlantic Coast Beach Nourishment Projects fall within the boundaries of the NYB population.

Atlantic sturgeon spend a majority of their adult phase migrating through marine waters. Consequently, they may be present in borrow areas being used for beach nourishment activities. Incidental take from dredges is possible. Therefore, we have determined that Atlantic sturgeon may be affected by beach nourishment projects within the Philadelphia District.

In light of changes to the project status and conditions and the availability of new information on several listed species, the Corps will reassess the effects and jeopardy analyses for sea turtles, shortnose sturgeon and whales in a new Biological Assessment. In the process, we will also consider whether there is a need to revise the analysis of the status of the species, environmental baseline, and cumulative effects. Additionally, we will reflect the change in the listing of loggerhead sea turtles from a single species to separate DPSs, a change that did not previously trigger reinitiation.

Section 7(a)(2) Analysis for the Reinitiation Period

The Section 7(a)(2) analysis below for Atlantic sturgeon is only applicable to the proposed action during the reinitiation period and does not address the Corps' obligation to insure the action over a longer term is not likely to jeopardize listed species. A jeopardy determination commensurate with the temporal scope of the action is appropriately made only in the new Opinion. The dredging and placement activities associated with the Philadelphia District's beach nourishment program do not affect any critical habitat; therefore, critical habitat will not be addressed below.

Scope of the Analysis

In the analysis below, the Corps determines whether, during the reinitiation period, the Corps continues to ensure that potential impacts of beach nourishment activities are not likely to jeopardize the NYB Atlantic sturgeon DPS. The period of impacts to be considered begins now until completion of a new Opinion. Barring unforeseen circumstances, it is anticipated that a new Opinion will be completed by approximately December 31, 2013. Therefore, the period of analysis will be from now until December 31, 2013.

Effects of the Beach Nourishment Activities During the Reinitiation Period

"To jeopardize the continued existence of" means to engage in an action that reasonably would be expected , directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). To make a jeopardy determination, the Corps will consider whether there will be a reduction in reproduction, numbers, or distribution. If there is a reduction in one or more of those factors, it must be determined whether that reduction will cause an appreciable reduction in the likelihood of survival and recovery of the species.

Atlantic sturgeon

With regard to potential physical injuries to Atlantic sturgeon, the potential exists for them to become entrained during dredging operations. Dickerson (2006, as cited by ASSRT, 2007) believes that direct physical impacts to sturgeon is associated with dredging machinery *(i.e.* drag arms, pumps). It is expected, however, that most adult sturgeon would actively avoid a working dredge. O'Herron *et al.* (1985) did a study of shortnose sturgeon in the upper tidal Delaware River to assess potential impacts of maintenance dredging of the Duck Island and Perriwig ranges between June and November 1983. They found no evidence of sturgeon killed or injured by the dredging operation. They also observed that adult shortnose sturgeon had a tendency to move away from the dredge and returned only after the dredge had left the area. The chance of the dredges being used for these projects coming into contact with an Atlantic sturgeon during the dredging operations is extremely small. Unlike the more confined area of river dredging, dredging in the Inlet and offshore borrow areas currently proposed for use represent a very small percentage of the habitat available to Atlantic sturgeon. In addition, since the coastal environment represents a migration area, as opposed to a spawning area, potential impacts are expected to be minimal.

The dredging associated with the beach nourishment would result in short-term adverse impacts to water quality in the immediate vicinity of the dredging and beach nourishment operations. Dredging in the proposed borrow areas will generate turbidity, resulting in sedimentation impacts within the immediate vicinity of the operations. Short-term increased turbidity can

affect organisms in several ways. Primary production in phytoplankton and/or benthic algae may become inhibited from turbidity. Suspended particulate matter can clog gills and inhibit filter-feeding species. Reilly *et al.*, 1983 determined that high turbidity could inhibit recruitment by pelagic larval stocks. In addition, midwater nekton like finfish and mobile benthic invertebrates may migrate outside of the area where turbidity and deposition occur.

The amount of turbidity and its associated plume is mainly dependent on the grain size of the material. Generally, the larger the grain-size, the smaller the area of impact. The period of turbidity is also less with larger grain-sized materials. The proposed borrow locations contains medium to fine sands, which are coarser grained than silts and clays. Turbidity resulting from the resuspension of these sediments is expected to be localized and temporary in nature.

Similar water quality effects on aquatic organisms could likely be incurred from the deposition of borrow material on the beach. Increased turbidity resulting from the deposition of a slurry of sand will be temporary in nature and localized. This effect will not be significant as turbidity levels are naturally high in the high-energy surf zone. Organisms in the surf zone versus deep water areas will be less likely to suffer adverse effects from turbidity because they have already adapted to these conditions. Material taken from the proposed borrow areas will have low quantities of silt, therefore, high levels of turbid waters after deposition should not persist.

Depending upon the duration, location, distance to the fish, and type of sound (i.e., explosions vs. vessel sounds), man-made noise in the marine environment has the potential to impact Atlantic sturgeon. Studies have found that there are a wide range of potential impacts in response to sounds by fish, ranging from death to behavioral responses. According to Normandeau, 2012, little research has been done on the effects of sound from dredging on marine life, and therefore, little data is available. Behavioral reactions to dredging are to be expected, however, with possible negative consequences. Behavioral changes could consist of a mild "awareness" of the sound, a startle response (but otherwise no change in behavior) (Wardle *et al.*, 2001), small temporary movements for the duration of the sound, or larger movements that might displace fish from their normal locations for short or long periods of time. Depending upon the level of behavioral change, there may be no significant impact on individual fish or fish populations or there may be a substantial change (e.g. movement from a feeding or breeding site) which could negatively impact the survival of a population (Popper and Hastings, 2009).

The noise associated with dredging and sand placement activities will be fairly continuous throughout the course of the construction activities but they are not expected to have a significant impact on the sturgeon. It is expected that sturgeon will avoid the borrow areas during construction but will return once work is complete. Due to the open water nature of the borrow areas, this temporary movement away from the borrow area does not constitute a significant effect to the species.

Through the implementation of protective measures for Atlantic sturgeon the Corps believes it will be possible to minimize and in some cases eliminate any impacts to the species. Since the implementation of NMFS's original Biological Opinion for dredging within the Philadelphia District in 1996, no sea turtles, whales or sturgeon have been taken during dredging in offshore and inlet borrow areas along the Atlantic Coast. Prior to the implementation of the UXO

screening, all hopper dredging from June through November included turtle monitoring, which equates to approximately 15 years worth of monitoring in these areas with no takes.

Based on this information, the Corps has determined that the continued implementation of the Philadelphia District's beach nourishment projects during the reinitiation period is not likely to jeopardize the continued existence of the Atlantic sturgeon NYB DPS.

Section 7(d) Considerations

Section 7(d) of the Endangered Species Act (ESA) prohibits Federal agencies from making any irreversible or irretrievable commitment of resources with respect to the agency action that would have effect of foreclosing the formulation or implementation of any reasonable and prudent alternatives at the conclusion of the consultation. This prohibition is in force until the requirements of section 7(a)(2) have been satisfied. Section 7(d) does not prohibit all aspects of an agency action from proceeding during consultation; non-jeopardizing activities may proceed as long as their implementation would not violate section 7(d). As explained above, continuation of the District's beach nourishment projects under the 1996 Opinion pending completion of reinitiated consultation will not result in jeopardy to listed species. Congress intended section 7(d) to prevent an action agency from "steamrolling" a project by developing it to a stage at which options that would avoid jeopardizing listed species, and that would have been available a the onset of the action, are not longer reasonable and prudent due to the foregone commitment of resources to the original project design.

Since the beach nourishment activities that would be conducted during the reinitiation period are nourishment cycles for previously approved and constructed projects, this work would not preclude the implementation of reasonable and prudent measures for future nourishment activities. Nourishment of these projects generally takes place on 2 to 6 year cycles. Due to impacts from Hurricane Sandy, some of the projects are being nourished outside of their normal cycles. If consultation results further conservation recommendations, these recommendations will be included in all future beach nourishment activities.

Conclusions

While it is possible for Atlantic sturgeon to become entrained in the dredge during dredging operations, this is highly unlikely due to the transient nature of the species in the marine environment and their tendency to avoid dredging operations. Minor and temporary impacts to water quality and prey resources are expected within the borrow and placement areas. Minor and temporary impacts associated with regard to noise are also expected. In order to minimize impacts to all listed species, hydraulic cutterhead dredges will be used to the greatest extent possible.

Based on this analysis, we have determined that reinitiation of consultation for beachfill projects within the Philadelphia District is required and that allowing dredging to continue during the reinitiation period will not violate section 7(a)(2) or 7(d). This 7(a)(2) determination is only applicable during the reinitiation period (i.e., until approximately December 31, 2013) and does

not address the Corps' longer term obligation to ensure the action is not likely to jeopardize the continued existence of listed species.

References:

Atlantic Sturgeon Status Review Team (ASSRT). 2007. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Report to National Marine Fisheries Service, Northeast Regional Office. 174 pp.

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Normandeau Associates, Inc. 2012. Effects of Noise on Fish, Fisheries and Invertebrates in the U.S. Atlantic and Arctic from Energy Industry Sound-Generating Activities. A Literature Synthesis for the U.S. Department of the Interior, Bureau of Ocean Energy Management. Contract #M11PC00031.

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DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO ATTENTION OF

Environmental Resources Branch

MAR 18 2013

Ms. Grace Musumeci, Chief
Environmental Review Section
Strategic Planning and Multi-Media Programs Branch
USEPA Region II
290 Broadway
New York, NY 10007-1866

Dear Ms. Musumeci:

The purpose of this letter is to solicit comments from the Environmental Protection Agency (EPA) Region 2 to identify any significant issues that may have arisen on the Great Egg Harbor Inlet to Townsends Inlet Hurricane and Storm Damage Reduction Project subsequent to the filing of the document: "*Great Egg Harbor Inlet to Townsends Inlet, Final Feasibility Report and Integrated Environmental Impact Statement (EIS)* (CEQ#020033)" on February 1, 2002 (A Record of Decision (ROD) was signed on October 18, 2011.). Although no actual physical construction has taken place on this project, it is currently within the construction phase, and the Corps is working towards the execution of a Project Partnership Agreement (PPA) with the New Jersey Department of Environmental Protection. In addition, this project could receive funding in accordance with The Disaster Relief Appropriations Act of 2013, reference 1(a) (PL 113-2), which was passed by Congress and signed into law on 29 January 2013 in response to the devastating coastal storm, known as Hurricane Sandy that struck the Eastern region of the United States in October 2012. The legislation provides funding and authority for the Corps of Engineers related to the consequences of Hurricane Sandy, which may include previously authorized but unconstructed projects and any projects under study for reducing flooding and coastal storm damage risks.

The Draft Environmental Impact Statement (DEIS) on this project was reviewed by EPA Region 2, and provided comments by letter dated July 12, 2001. This document was assigned a rating of EC-2. Subsequent review of the Final Environmental Impact Statement (FEIS) was provided by EPA Region 2 by letter dated February 28, 2002 (enclosed), which concluded that EPA had no objection to the implementation of the project. Because it has been more than 5 years since the last project coordination and review was undertaken with EPA, we are conducting a review of any significant changes to the project, existing conditions, or policy changes that may have an impact on the project. As part of this review, we are requesting comments on significant issues that

may have an impact on the implementation of this project. This review will be included in a Limited Re-evaluation Report (LRR). To date, there have been no significant changes to the project scope.

The project area is located in southern New Jersey and extends approximately 15 miles in length from Great Egg Harbor Inlet to Townsends Inlet. It encompasses two barrier islands, Peck Beach (containing Ocean City) and Ludlam Island (Strathmere and Sea Isle City). The study area has been historically subject to significant damages due to storm events. The 1962 Northeaster resulted in damage to 8,467 structures within the entire study area at a cost of $140,000,000 (converted to 1999 dollars). Continued real estate development since this time has increased the potential for storm damages.

The feasibility study evaluated various alternative plans of improvement formulated for hurricane and storm damage reduction. To effectively address the problem, separate plans were formulated for Ocean City and Ludlam Island.

The selected plan for South End Ocean City consists of a berm and dune utilizing sand obtained from an offshore borrow source. The dune crest has a top elevation of +12.8 ft NAVD88, while the berm extends from the seaward toe of the dune for a distance of 100 feet at an elevation of +7.0 ft NAVD88 before sloping down at 1V:25H to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) is 218 feet.

The plan extends from 34th Street to 59th Street for a total length of 2.6 miles. Initial sand quantity is estimated at 1,603,000 cubic yards. Periodic nourishment of 403,000 cubic yards is scheduled to occur every 3 years synchronized with the existing Federal beachfill project at Ocean City (Great Egg Harbor Inlet to 34th Street). Material would be taken from the borrow source identified as "M8".

The selected plan for Ludlam Island also consists of a berm and dune utilizing sand obtained from an offshore borrow source. The dune crest has a top elevation of +14.8 ft NAVD88, while the berm width extends from the seaward toe of the dune for a distance of 50 ft. at an elevation of +6.0 ft. NAVD88 before sloping down (varying from 1V:30H to 1V:50H) to elevation -1.25 ft NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) varies depending upon location from 190 to 285 feet.

The plan extends from about 125 feet north of Seaview Avenue in Strathmere to Pleasure Ave (just beyond 93rd Street) in Sea Isle City for a total length of 6.5 miles. In addition, there is a taper of 734 feet into Corson's Inlet State Park and a taper of 66 feet into the terminal groin south of 93rd Street. Total length of beachfill, including tapers, is 6.7 miles. The plan also includes the extension of two stormwater outfall pipes at both 84th and 88th Street in Sea Isle City by 150 feet.

Initial sand quantity is estimated at 5,146,000 cubic yards. Periodic nourishment of 1,820,000 cubic yards is scheduled to occur every 5 years. Material would be taken from the borrow sources identified as "L3", "L1", and "C1".

As stated above, we do not foresee any significant changes in the project scope and area of impact since the reviews of the previous documents were performed. Please review the aforementioned documents and provide any comments that you may have on the project, as proposed, by April 12, 2013. A copy of the 2001 Feasibility Report and Final Integrated Environmental Impact Statement is provided in the enclosed CD. A non-response from EPA would indicate that there are no new comments/significant issues since the letter from February 28, 2002. If you have any questions regarding this project, please contact Steve Allen of the Environmental Resources Branch at (215) 656-6559. Thank you.

Sincerely,

C. MacIntosh

Charles P. MacIntosh
Acting Chief, Planning Division

Enclosures

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO ATTENTION OF

Environmental Resources Branch

MAR 18 2013

Ms. Karen Greene
National Marine Fisheries Service
Habitat Conservation Division
James J. Howard Marine Sciences Laboratory
74 Magruder Road
Highlands, New Jersey 07732

Dear Ms Greene:

The purpose of this letter is to solicit comments from the National Marine Fisheries Service to identify any significant issues that may have arisen on the Great Egg Harbor Inlet to Townsends Inlet Hurricane and Storm Damage Reduction Project subsequent to the filing of the document: *"Great Egg Harbor Inlet to Townsends Inlet, Final Feasibility Report and Integrated Environmental Impact Statement (EIS)"* on February 1, 2002. A Record of Decision (ROD) was signed on October 18, 2011.

Although no physical construction has taken place on this project, it is currently within the construction phase, and the Corps is working towards the execution of a Project Partnership Agreement (PPA) with the New Jersey Department of Environmental Protection. In addition, this project could receive funding in accordance with The Disaster Relief Appropriations Act of 2013, reference 1(a) (PL 113-2), which was passed by Congress and signed into law on 29 January 2013 in response to the devastating coastal storm, known as Hurricane Sandy that struck the Eastern region of the United States in October 2012. The legislation provides funding and authority for the Corps of Engineers related to the consequences of Hurricane Sandy, which may include previously authorized but unconstructed projects and any projects under study for reducing flooding and coastal storm damage risks.

In accordance with the Magnuson Stevens Fishery Conservation and Management Act, conservation recommendations were received from NMFS in a letter dated June 22, 2001 based on an Essential Fish Habitat (EFH) Evaluation provided in the EIS. A copy of the letter with Philadelphia District responses from the FEIS is enclosed. Because it has been more than 5 years since the last project coordination and review was undertaken, we are conducting a review of any significant changes to the project, existing conditions, or policy changes that may have an impact on the project. As part of this review, we are requesting comments on significant issues that may have an impact on the implementation of this project. This review will be included in a Limited Re-evaluation Report (LRR). To date, there have been no significant changes to the project scope.

The project area is located in southern New Jersey and extends approximately 15 miles in length from Great Egg Harbor Inlet to Townsends Inlet. It encompasses two barrier islands, Peck Beach (containing Ocean City) and Ludlam Island (Strathmere and Sea Isle City). The study area has been historically subject to significant damages due to storm events. The 1962 Northeaster resulted in damage to 8,467 structures within the entire study area at a cost of $140,000,000 (converted to 1999 dollars). Continued real estate development since this time has increased the potential for storm damages.

The feasibility study evaluated various alternative plans of improvement formulated for hurricane and storm damage reduction. To effectively address the problem, separate plans were formulated for Ocean City and Ludlam Island.

The selected plan for South End Ocean City consists of a berm and dune utilizing sand obtained from an offshore borrow source. The dune crest has a top elevation of +12.8 ft NAVD88, while the berm extends from the seaward toe of the dune for a distance of 100 feet at an elevation of +7.0 ft NAVD88 before sloping down at 1V:25H to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) is 218 feet.

The plan extends from 34th Street to 59th Street for a total length of 2.6 miles. Initial sand quantity is estimated at 1,603,000 cubic yards. Periodic nourishment of 403,000 cubic yards is scheduled to occur every 3 years synchronized with the existing Federal beachfill project at Ocean City (Great Egg Harbor Inlet to 34th Street). Material would be taken from the borrow source identified as "M8".

The selected plan for Ludlam Island also consists of a berm and dune utilizing sand obtained from an offshore borrow source. The dune crest has a top elevation of +14.8 ft NAVD88, while the berm width extends from the seaward toe of the dune for a distance of 50 ft. at an elevation of +6.0 ft. NAVD88 before sloping down (varying from 1V:30H to 1V:50H) to elevation -1.25 ft NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) varies depending upon location from 190 to 285 feet.

The plan extends from about 125 feet north of Seaview Avenue in Strathmere to Pleasure Ave (just beyond 93rd Street) in Sea Isle City for a total length of 6.5 miles. In addition, there is a taper of 734 feet into Corson's Inlet State Park and a taper of 66 feet into the terminal groin south of 93rd Street. Total length of beachfill, including tapers, is 6.7 miles. The plan also includes the extension of two stormwater outfall pipes at both 84th and 88th Street in Sea Isle City by 150 feet.

Initial sand quantity is estimated at 5,146,000 cubic yards. Periodic nourishment of 1,820,000 cubic yards is scheduled to occur every 5 years. Material would be taken from the borrow sources identified as "L3", "L1", and "C1".

As stated above, we do not foresee any significant changes in the project scope and area of impact since the reviews of the previous documents were performed. Please review the aforementioned documents and provide any comments that you may have on the project, as proposed, by April 12, 2013. A copy of the 2001 Feasibility Report and Final Integrated Environmental Impact Statement is provided in the enclosed CD. A non-response from your office would indicate that there are no new comments/significant issues since the EFH review conducted in 2001. If you have any questions regarding this project, please contact Steve Allen of the Environmental Resources Branch at (215) 656-6559. Thank you.

Sincerely,

C. MacIntosh

Charles P. MacIntosh
Acting Chief, Planning Division

Enclosure

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO ATTENTION OF

Environmental Resources Branch

MAR 18 2013

Mr. Eric Davis, Supervisor
New Jersey Field Office
U.S. Fish and Wildlife Service
927 North Main Street (Bldg. D)
Pleasantville, NJ 08232

Dear Mr. Davis:

The purpose of this letter is to solicit comments from the New Jersey Field Office (NJFO) to identify any significant issues that may have arisen on the Great Egg Harbor Inlet to Townsends Inlet Hurricane and Storm Damage Reduction Project subsequent to the filing of the document: "*Great Egg Harbor Inlet to Townsends Inlet, Final Feasibility Report and Integrated Environmental Impact Statement (EIS)*" on February 1, 2002.(A Record of Decision (ROD) was signed on October 18, 2011.). Although no actual physical construction has taken place on this project, it is currently within the construction phase, and the Corps is working towards the execution of a Project Partnership Agreement (PPA) with the New Jersey Department of Environmental Protection. In addition, this project could receive funding in accordance with The Disaster Relief Appropriations Act of 2013, reference 1(a) (PL 113-2), which was passed by Congress and signed into law on 29 January 2013 in response to the devastating coastal storm, known as Hurricane Sandy that struck the Eastern region of the United States in October 2012. The legislation provides funding and authority for the Corps of Engineers related to the consequences of Hurricane Sandy, which may include previously authorized but unconstructed projects and any projects under study for reducing flooding and coastal storm damage risks.

In accordance with the Fish and Wildlife Coordination Act (FWCA), a Section 2(b) FWCA report (dated July 5, 2001) was prepared by the NJFO; and in accordance with Section 7 of the Endangered Species Act, a programmatic Biological Opinion (dated December 27, 2005) that includes this project was also prepared by NJFO. Because it has been more than 5 years since the last project coordination and review was undertaken with NJFO, we are conducting a review of any significant changes to the project, existing conditions, or policy changes that may have an impact on the project. As part of this review, we are requesting comments on significant issues that may have an impact on the implementation of this project. This review will be included in a Limited Re-evaluation Report (LRR). To date, there have been no significant changes to the project scope.

The project area is located in southern New Jersey and extends approximately 15 miles in length from Great Egg Harbor Inlet to Townsends Inlet. It encompasses two barrier islands, Peck Beach (containing Ocean City) and Ludlam Island (Strathmere and Sea Isle City). The study area has been historically subject to significant damages due to storm events. The 1962 Northeaster resulted in damage to 8,467 structures within the entire study area at a cost of $140,000,000 (converted to 1999 dollars). Continued real estate development since this time has increased the potential for storm damages.

The feasibility study evaluated various alternative plans of improvement formulated for hurricane and storm damage reduction. To effectively address the problem, separate plans were formulated for Ocean City and Ludlam Island.

The selected plan for South End Ocean City consists of a berm and dune utilizing sand obtained from an offshore borrow source. The dune crest has a top elevation of +12.8 ft NAVD88, while the berm extends from the seaward toe of the dune for a distance of 100 feet at an elevation of +7.0 ft NAVD88 before sloping down at 1V:25H to elevation -1.25 ft. NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) is 218 feet.

The plan extends from 34th Street to 59th Street for a total length of 2.6 miles. Initial sand quantity is estimated at 1,603,000 cubic yards. Periodic nourishment of 403,000 cubic yards is scheduled to occur every 3 years synchronized with the existing Federal beachfill project at Ocean City (Great Egg Harbor Inlet to 34th Street). Material would be taken from the borrow source identified as "M8".

The selected plan for Ludlam Island also consists of a berm and dune utilizing sand obtained from an offshore borrow source. The dune crest has a top elevation of +14.8 ft NAVD88, while the berm width extends from the seaward toe of the dune for a distance of 50 ft. at an elevation of +6.0 ft. NAVD88 before sloping down (varying from 1V:30H to 1V:50H) to elevation -1.25 ft NAVD88. The remainder of the design template parallels the existing profile slope to the depth of closure. The total width from the seaward toe of the dune to Mean High Water (MHW) varies depending upon location from 190 to 285 feet.

The plan extends from about 125 feet north of Seaview Avenue in Strathmere to Pleasure Ave (just beyond 93rd Street) in Sea Isle City for a total length of 6.5 miles. In addition, there is a taper of 734 feet into Corson's Inlet State Park and a taper of 66 feet into the terminal groin south of 93rd Street. Total length of beachfill, including tapers, is 6.7 miles. The plan also includes the extension of two stormwater outfall pipes at both 84th and 88th Street in Sea Isle City by 150 feet.

Initial sand quantity is estimated at 5,146,000 cubic yards. Periodic nourishment of 1,820,000 cubic yards is scheduled to occur every 5 years. Material would be taken from the borrow sources identified as "L3", "L1", and "C1".

As stated above, we do not foresee any significant changes in the project scope and area of impact since the reviews of the previous documents were performed. The project areas have recent and historical nesting of the Federally listed threatened piping plover (*Charadrius melodus*) and occurrences of seabeach amaranth (*Amaranthus pumilus*). In accordance with the programmatic Biological Opinion (dated December 25, 2007), a streamlined consultation will be initiated at least 6 months prior to construction.

Please review the aforementioned documents and provide any comments that you may have on the project, as proposed, by April 12, 2013. A copy of the 2001 Feasibility Report and Final Integrated Environmental Impact Statement is provided in the enclosed CD. A non-response from NJFO would indicate that there are no new comments/significant issues since the issuance of the FWCA 2(b) Report or the programmatic Biological Opinion. If you have any questions regarding this project, please contact Steve Allen of the Environmental Resources Branch at (215) 656-6559. Thank you.

Sincerely,

C. MacIntosh

Charles P. MacIntosh
Acting Chief, Planning Division

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

APR 1 2 2013

Mr. Charles P. MacIntosh
Acting Chief, Planning Division
Department of the Army
Philadelphia District, Corps of Engineers
Wanamaker Building, 100 Penn Square East
Philadelpha, PA 19107

Dear Mr. MacIntosh:

This is a response to your March 18, 2013 letter to the U.S. Environmental Protection Agency (EPA) soliciting comments regarding any significant issues that may have arisen on the Great Egg Harbor Inlet to Townsends Inlet Hurricane and Storm Damage Reduction Project subsequent to the filing of the document: "*Great Egg Harbor Inlet to Townsends Inlet, Final Feasibility Report and Integrated Environmental Impact Statement (EIS)* (CEQ# 020033)." In your letter you clarified that no actual physical construction has taken place on the project, however the project is currently within the construction phase and the US Army Corps of Engineers (Corps) is working towards the execution of a Project Partnership Agreement (PPA) with the New Jersey Department of Environmental Protection. Further, the project may receive funding from the Disaster Relief Appropriations Act of 2013. You have requested that the EPA provide comments on any significant issues or policy changes that may have an impact on the project. The review that is currently being conducted will be included in a Limited Re-evaluation Report (LRR). There are currently no significant changes to the scope of the project from when the EIS was reviewed and commented on by the EPA on February 28, 2002.

The Draft EIS was initially rated an EC2, citing the need for the Corps to "include, to the extent possible, a discussion of the overall cumulative effect of federal replenishment projects along the New Jersey coast." The "Cumulative Effects" section of the Final EIS sufficiently addressed this comment. As a result of the damage caused during Hurricane Sandy to the New Jersey shore, and the Eastern region of the United States, there are a significant number of on-going restoration projects to rebuild, repair and enhance the affected coastal and inland areas that were affected. We believe the LRR should include an evaluation of the cumulative impacts of simultaneous recovery projects in areas such as the impacts of sand demand.

In February 2012, a distinct population segment of Atlantic Sturgeon found in the New York Bight was listed as Endangered under the Endangered Species Act (ESA). Subsequently, EPA recommends a consultation was the National Oceanic and Atmospheric Administration be initiated to ensure that the actions associated with this project do not adversely effect any Atlantic Sturgeon and therefore ensure compliance with ESA.

If you have any questions about this letter, please contact Stephanie Lamster of my staff at 212-637-3565.

Sincerely,

Grace Mususmeci, Chief
Environmental Review Section

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

Charles MacIntosh, Acting Chief
Planning Division
U.S. Army Corps of Engineers
Philadelphia District
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

APR 15 2013

ATTN: Mr. Steven Allen

Dear Mr. MacIntosh:

This responds to your letter of March 18, 2013, soliciting comments from the National Marine Fisheries Service (NMFS) to identify any significant issues that may have arisen on the Great Egg Harbor Inlet to Townsends Inlet Hurricane and Storm Damage Reduction Project subsequent to the filing of the final feasibility report and environmental impact statement (EIS) on February 1, 2002. The project is located in Cape May County, New Jersey. It extends 15 miles from the Great Egg Harbor Inlet south to Townsends Inlet and includes two barrier islands, Peck Beach (containing Ocean City) and Ludlam Island (Strathmere and Sea Isle City). The selected plan includes the construction of berms and dunes, as well as beach renourishment on a periodic basis throughout the project area. It is estimated that a total of 5,146,000 cubic yards (cy) of sand will be needed for the initial project construction. Periodic renourishment of 1,820,000 cy would be expected to occur every five years. The material would be obtained from offshore borrow areas identified as areas L3, L1 and C1.

Although no physical construction has taken place on this project, it is currently in the construction phase and you are working towards Project Partnership Agreement (PPA) with the New Jersey Department of Environmental Protection. The project could also receive funding in accordance with the Disaster Relief Appropriations Act of 2013 (PL 113-2) which provides funding and authority to you for work related to the consequences of Hurricane Sandy. Because it has been more than five years since the last project coordination and review was undertaken, you are conducting a review of any significant changes to the project, existing conditions, or policy changes that may have an impact on the project. This review will be included in a Limited Re-evaluation Report (LRR) for the project.

General Comments

We have coordinated with you on this project since the mid-1990's evaluating the effects of the proposed activities on our resources and to minimize those effects where possible. Our last review of the entire project and the offshore borrow areas was in 2001. Several issues have arisen since that time that should be addressed as part of the LRR including an awareness of the

potential effects of inlet dredging on aquatic resources transiting the inlet, changes in the condition of surf clam (*Spisula solidissima*) populations in southern New Jersey, and the listing of Atlantic sturgeon (*Acipenser oxyrinchus*) as endangered under the Endangered Species Act.

Borrow area C1 is located at the opening of Corson Inlet. A wide variety of species under our stewardship transit Corson Inlet to access the estuarine waters of the back bays behind the barrier islands and the associated tributaries for spawning, nursery and forage habitat or use the estuarine complex to complete all or part of their life cycle. These species include both state and federally managed species and their forage, notably bluefish (*Pomatomus saltatrix*), summer flounder (*Paralichthys dentatus*), scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata*), Atlantic butterfish (*Peprilus triacanthus*), winter flounder (*Pseudopleuronectes americanus*), windowpane flounder *(Scophthalmus aquosus)*, weakfish (*Cyanoscion regalis*), striped bass (*Morone saxatilis*), tautog (*Tautoga onitis*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), killifish (*Fundulus spp.*), Atlantic silversides (*Menidia menidia*), bay anchovies (*Anchoa mitchilli*) and other assorted baitfishes and shrimps (e.g., *Neomysis americana*, *Mysidopsis bigelowi*).

Diadromous species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass and American eel (*Anguilla rostrata*) transit the inlet to reach freshwater tributaries for spawning or growth to maturity. Alewife and blueback herring were designated as candidate species for listing under the Endangered Species Act (ESA) in 2011. Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which we have initiated an ESA status review and have announced that review in the Federal Register. More information on these species and the Candidate Species program can be found at: http://www.nmfs.noaa.gov/pr/species/esa/other.htm. In addition, the U.S. Fish and Wildlife Service has begun a status review for the American eel to determine if listing under the ESA is warranted.

Adult female blue crabs overwinter at the mouths of New Jersey inlets in the winter, generally December through March, so they are in position to release their eggs in spring in a location that will allow their eggs to be carried into the ocean. The crabs burrow into surficial sediments as water temperature declines and overwinter in a dormant, immobile state until water temperature rise above approximately 10 degrees C in the spring. Steimle et al. (2000) has documented that juvenile blue crabs are a food source for several state and federally managed fish species including winter flounder, little skate, winter skate, scup, and summer flounder.

The LRR should evaluate the potential effects of dredging sand from within borrow area C1 on the movements of aquatic resources through the inlet. The intention is not to preclude the use of this borrow area, but to consider the potential impacts and evaluate possible mitigative measures.

In addition, the surf clam data used in the evaluations was collected in 1999 and 2000. Since that time, there has been a dramatic reduction in the biomass of New Jersey's inshore surf clam stocks (MAFMC 2011). The State of New Jersey monitors this fishery closely. To ensure that

accurate data are being used to determine the potential effects of the use of the offshore borrow areas on this important species, the Corps should contact New Jersey's Department of Environmental Protection's Bureau of Shellfisheries and incorporate their latest data into the LRR. Any data gaps should be filled with additional project specific sampling of the proposed borrow areas.

Magnuson Stevens Act (MSA)

The MSA requires federal agencies including the Corps to consult with NMFS regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect EFH identified under the MSA. The consultation for this project was completed in 2001. At that time, we reviewed the essential fish habitat assessment (EFH) included in the draft feasibility report and integrated EIS. No EFH conservation recommendations were offered at that time based upon several conditions that have been incorporated into the project design. These include avoiding prime fishing habitat and relic shoal habitats, avoiding high density surf clam beds, dredging no deeper that ten feet below the existing bottom levels and pre and post construction monitoring on the borrow areas. We understand that these conditions remain part of the project.

As discussed above, several issues have emerged which warrant reevaluation, particularly updating the surf clam information and assessment of the effects of inlet dredging on aquatic resources. Because some of the species that may be affected are federally managed under the MSA and have EFH designated in the project area, the Corps should reinitiate consultation pursuant to 50 CFR 600.920(l) as part of the LRR.

As discussed in previous letters, on other inlet dredging projects, summer flounder is one species of particular concern that should be included in an updated EFH assessment. Able *et al.* (1990) reported that transforming summer flounder larvae have been collected in most of the major inlets along the New Jersey coast including Shark River Inlet, Manasquan River Inlet, Little Egg Inlet, Absecon Inlet, Corson Inlet and the Maurice River. The movement of transforming individuals through inlets in New Jersey occurs primarily between October through December, but larvae have been collected as late as February in Little Sheepshead Creek inside Little Egg Inlet, March and May in the Maurice River, March in the Manasquan River Inlet and Corson Inlet and March and April in Absecon Inlet (Able *et al.* 1990.) Festa (1974) also studied the distribution of young and larval summer flounder in New Jersey estuaries, including Corson Inlet from 1962 to 1972. Festa's study also found that larvae enter New Jersey estuaries from at least early October to late January in most years and as late as March is certain years.

An updated EFH assessment should consider the potential effects of dredging on larvae entering the inlet, as well as the possible effects on eggs and larvae of other species that are transported through the inlets throughout the year. Since these life stages are not capable of moving away from a dredge, even those species that are pelagic can be entrained in the dredge if the suction is on while the dredge head is moving through the water column. In addition, as mentioned above anadromous fish species enter the estuaries through the various inlets along the coast including Corson Inlet. Buckel and Conover (1997) in Fahey et al. (1999) reports that diet items of juvenile bluefish include *Alosa* species such as these. As a result, activities that adversely affect

the spawning success and the quality for the nursery habitat of these anadromous fish can adversely affect the EFH for juvenile bluefish by reducing the availability of prey items. Water quality degradation, increased turbidity, noise and vibrations from dredging operations may impede the migration of anadromous fish through the inlets to their upstream spawning grounds.

Endangered Species Act

Section 7 of the Endangered Species Act (16 U.S.C. § 1536(a)(2)) requires Federal agencies to consult with the Secretary of Commerce, through NOAA, to insure that "any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or adversely modify or destroy [designated] critical habitat . . . ." *See also* 50 C.F.R. part 402. The following ESA listed species under NMFS jurisdiction are likely to occur in the waters off New Jersey:

Sea Turtles

Listed sea turtles are found seasonally in the waters off of New Jersey, typically between April and November. The species that are likely to be present include: the federally threatened Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead (*Caretta caretta*) sea turtles, as well as the federally endangered Kemp's ridley (*Lepidochelys kempi*), leatherback (*Dermochelys coriacea*) and green *(Chelonia mydas)* sea turtles.

Cetaceans

Federally endangered North Atlantic right (*Eubalaena glacialis*), fin (*Balaenoptera physalus*), and humpback whales (*Megaptera novaeangliae*) are found in the waters off of New Jersey. North Atlantic right whales are known to use the nearshore, coastal waters of the Atlantic Ocean as a migration route to and from calving grounds throughout the year. Within the waters of the proposed offshore borrow area, North Atlantic right whales are likely to occur primarily during the months of November 1 through April 30[1]. Humpback whales feed during the spring, summer, and fall over a range that encompasses the eastern coast of the United States, while fin whales may be present off the coast of New Jersey year round. Sei (*Balaenoptera borealis*) and sperm (*Physter macrocephalus*) whales may also be present in the deeper offshore waters of New Jersey, and therefore, are not expected to occur in the project area.

Atlantic Sturgeon

There are five DPSs of Atlantic sturgeon listed as threatened or endangered. Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina DPSs are listed as endangered, while the Gulf of Maine DPS is listed as threatened (77 FR 5880; 77 FR 5914; February 6, 2012). The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida.

Atlantic sturgeon are known to occur within the nearshore, coastal waters of the Atlantic Ocean, primarily using these bodies of water throughout the year as a migratory pathway to and from

[1] From November 1 through April 30, a Seasonal Management Area (SMA) has been designated in the waters within, and near the entrance to the Delaware Bay. The proposed offshore borrow area is located in close proximity to this SMA and thus, compliance with the NMFS Ship Strike Reduction Rule is strongly recommended (see 50 CGR 224.105).

spawning, overwintering, and/or foraging grounds throughout their range. Young remain in their natal river/estuary until approximately age 2 (length of 30-36 inches) before emigrating to open ocean as subadults (Holland and Yelverton 1973; Dovel and Berggen 1983; Dadswell 2006; ASSRT 2007). After emigration from the natal river/estuary, subadults and adult Atlantic sturgeon travel within the marine environment, typically in waters between 5 to 50 meters in depth, using coastal bays, sounds, and ocean waters (Vladykov and Greeley 1963; Murawski and Pacheco 1977; Dovel and Berggren 1983; Smith 1985; Collins and Smith 1997; Welsh *et al.* 2002; Savoy and Pacileo 2003; Stein *et al.* 2004; Laney *et al.* 2007; Dunton *et al.* 2010; Erickson *et al.* 2011). As early life stages (e.g., eggs, larvae, young of the year), remain in their natal river/estuary, only subadult and adult Atlantic sturgeon will be found in the nearshore coastal waters of New Jersey, and thus, within the waters of the proposed offshore borrow area.

As ESA listed species of sea turtles, whales, and Atlantic sturgeon are known to occur in the waters off New Jersey, the designation and use of the proposed borrow area has the potential to affect these species, and thus, section 7 coordination will be necessary. To assist in our review of the proposed action, you will need to provide a detailed description of the proposed action, as well as, consider the direct, indirect, individual and cumulative effects of the designation and use of the proposed borrow area on these species. In addition, prior to any initiation of consultation, we would like to coordinate with you to discuss the proposed action and the best pathway forward for consultation. Should you have any questions regarding these comments, the section 7 process, or future section 7 coordination, please contact Danielle Palmer of our NMFS Protected Resources Division at danielle.palmer@noaa.gov or (978) 282-8468.

We look forward to continued coordination with your office on this project as it moves forward. If you have any questions or need additional information, please do not hesitate to contact Karen Greene at karen.greene@noaa.gov or (978) 317 5107 or (732) 872-3023.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
For Habitat Conservation

cc: PRD – D. Palmer, J. Crocker
NJDEP Office of Dredging - S. Dietrick
NJDEP Land Use – C. Keller
NJDEP Shellfisheries – J. Normant

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