US Army Corps
of Engineers

Philadelphia District

DRAFT ENVIRONMENTAL ASSESSMENT (EA)

EXPANSION OF OFFSHORE BORROW AREA K FOR THE CAPE MAY INLET TO LOWER TOWNSHIP STORM DAMAGE REDUCTION PROJECT AND THE LOWER CAPE MAY MEADOWS – CAPE MAY POINT ENVIRONMENTAL RESTORATION PROJECT
CAPE MAY COUNTY, NEW JERSEY

JULY 2018

PREPARED BY:

U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT

FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR EXPANSION OF OFFSHORE BORROW AREA K FOR THE CAPE MAY INLET TO LOWER TOWNSHIP STORM DAMAGE REDUCTION PROJECT AND THE LOWER CAPE MAY MEADOWS – CAPE MAY POINT ENVIRONMENTAL RESTORATION PROJECT, CAPE MAY COUNTY, NEW JERSEY

In 1980, the United States Army Corps of Engineers (USACE), Philadelphia District, evaluated the potential environmental impacts associated with the construction of the Cape May Inlet to Lower Township Storm Damage Reduction Project, and prepared a Final Supplement to the Final Environmental Impact Statement (EIS). The selected plan involved the extension of two existing groins and the placement of sand obtained from an offshore borrow source to construct a berm for the purpose of storm damage reduction. To maintain the design template, this plan also included periodic nourishment every two years. The initial construction of sand placement and the extension of existing groins at Baltimore and Trenton Avenues was completed in 1991. Following the initial construction, 11 periodic nourishment cycles were completed. The next nourishment cycle is scheduled for December 2018. The total quantity of sand from offshore borrow areas placed to date is 5,791,145 cy.

In 1998, the District similarly evaluated the potential environmental impacts associated with environmental restoration activities at the Lower Cape May Meadows (The Meadows) and Cape May Point. The selected plan for this project involved protective dune/berm restoration extending from the 3rd Avenue terminal groin in Cape May City to the Central Avenue groin in Cape May Point. Periodic nourishment would be required every four years. The selected plan also involved the restoration of freshwater wetlands through the elimination of *Phragmites australis*, planting wetland vegetation, restoration of drainage ditches, installation of four water control structures, and creating three “piping plover” ponds behind the dune. Initial dune and beach construction was completed in 2005 with the placement of 1,406,000 cy of sand. Following the initial construction 3 periodic nourishment cycles were completed. The next nourishment is scheduled for 2020. The total quantity of sand placed to date is 2,485,000 cy

It is estimated that the existing Borrow Area K has approximately 3 million cubic yards of material remaining above elevation -40 feet NAVD 88. The last several dredging contractors however, have had significant impacts to productivity due to larger gravel and seashells at and just below the surface. This material clogs the screens required for Munitions and Explosives of Concern (MEC) avoidance. Based on the recent reduced productivity and the future need for additional sand for these projects, an expansion of Borrow Area K was investigated.

In 2011, benthic and cultural investigations were conducted on the expansion area which covers approximately 312 acres of ocean floor immediately adjacent to the existing Borrow Area K. It is estimated that approximately 4.2 million cubic yards of suitable sand is available in the expanded area.

In compliance with the National Environmental Policy Act of 1969, as amended, and CEQ regulations, the Philadelphia District prepared a draft Environmental Assessment (DEA) to document the proposed expansion of Borrow Area K. The EA for the change to these projects is being forwarded to the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the New Jersey State Historic Preservation Office (SHPO), NJDEP, and all other known interested parties for comment.

The EA has determined that the expansion of Borrow Area K for beach nourishment and restoration activities at Cape May City and The Meadows 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 has concluded that the project can be conducted in a manner which should not violate New Jersey's Water Quality Standards. Pursuant to Section 401 of the Clean Water Act, an updated 401 Water Quality Certificate is being requested from the NJDEP during the review of the draft EA. Based on the information developed during preparation of the EA, 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 consistent with the approved Coastal Zone Management Program of New Jersey.

The proposed expansion of Borrow Area K, and subsequent deposition of sediment will have *No Adverse Effect* to properties eligible for or listed on the National Register of Historic Places. The results of the investigation are being coordinated with the NJSHPO with the release of the Draft EA.

In accordance with the Clean Air Act, this project will comply with the General Conformity (GC) review requirement (40CFR§90.153), and based on a typical beachfill utilizing the expansion of Borrow Area K, would be below *de minimis* levels for NOx (100 tons in any year) and VOC (50 tons in any year).

Because the EA concludes that the expansion of Borrow Area K for the Cape May Inlet to Lower Township Storm Damage Reduction Project (1980) and the Lower Cape May Meadows – Cape May Point Environmental Restoration Project (1998) will not significantly affect the quality of the human environment, I have determined that a supplemental Environmental Impact Statement is not required.

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Date

Kristen Dahle
Lieutenant Colonel, Corps of Engineers
District Commander

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1 PROJECT DESCRIPTION

The purpose of this Environmental Assessment (EA) is to address the need to find additional sand resources for two ongoing USACE beach restoration projects. The information in this document updates and identifies changes to the previously published National Environmental Policy Act (NEPA) documents for the two applicable projects, Cape May Inlet to Lower Township Storm Damage Reduction Project (Cape May) and Lower Cape May Meadows – Cape May Point Environmental Restoration Project (The Meadows) (Figure 1). The USACE completed a Phase I General Design Memorandum, Final Supplement to the Final Environmental Impact Statement (EIS), dated August 1980 for the Cape May project and a Final Feasibility Report and Final EIS, dated August 1998 for The Meadows project. Additionally, supplemental Environmental Assessments (EA) were completed in 2002 and 2008 to address changes in borrow area locations for the two projects. To reduce duplication, only items involving new pertinent information and changes to the plans as previously proposed are addressed in this document. Items covered previously in the General Design Memorandum, Feasibility Report, and Final EISs and EAs are incorporated by reference and are referenced herein as USACE (1980, 1998, 2002 and 2008).

USACE (1980) identified a plan of improvement for Cape May consisting of the extension of two existing groins, placing beachfill to an elevation of +6.7 feet NAVD with a variable width of 25 to 180 feet, and periodic nourishment of 360,000 cy of material every two years. The project area includes the U.S. Coast Guard (USCG) Training Center and the City of Cape May (See Figure 1). Initial construction of the project was completed by the District in July 1991 in two major phases: placement of 465,000 cy of sand on the USCG Training Center beach completed in August 1989, followed by a separate contract placing 900,000 cy of sand on the Cape May City beach completed in July 1991. Also, as part of initial construction, the existing groins at Baltimore and Trenton Avenues were extended. Following initial construction, periodic nourishment was completed in 1993, 1995, 1997, 1999, 2003, 2004, 2007, 2009, 2012, 2013 (storm repair) and 2017. The next cycle of periodic nourishment is scheduled to take place in 2018. To date, approximately 5,791,145 cy of material have been placed on the beaches of the Coast Guard and Cape May City. This material has been obtained from a total of 4 offshore borrow areas (M1, 4, 5 and K) (See Figure 3).

USACE (1998) identified a plan of improvement for The Meadows consisting of protective dune/berm restoration with a berm width of 20 feet at elevation +6.7 feet NAVD and a dune elevation of +16.7 feet NAVD. The dune/berm extends from the 3rd Avenue terminal groin in Cape May City to the Central Avenue groin in Cape May Point (See Figure 1). The total length of fill is 10,050 linear feet (1.9 miles). Initial beachfill construction was completed in 2005 with the placement of 1,406,000 cy of sand. The plan also included planting 18 acres of dune vegetation. Environmental restoration of the wetlands behind the dune was also included in the project plan. These features

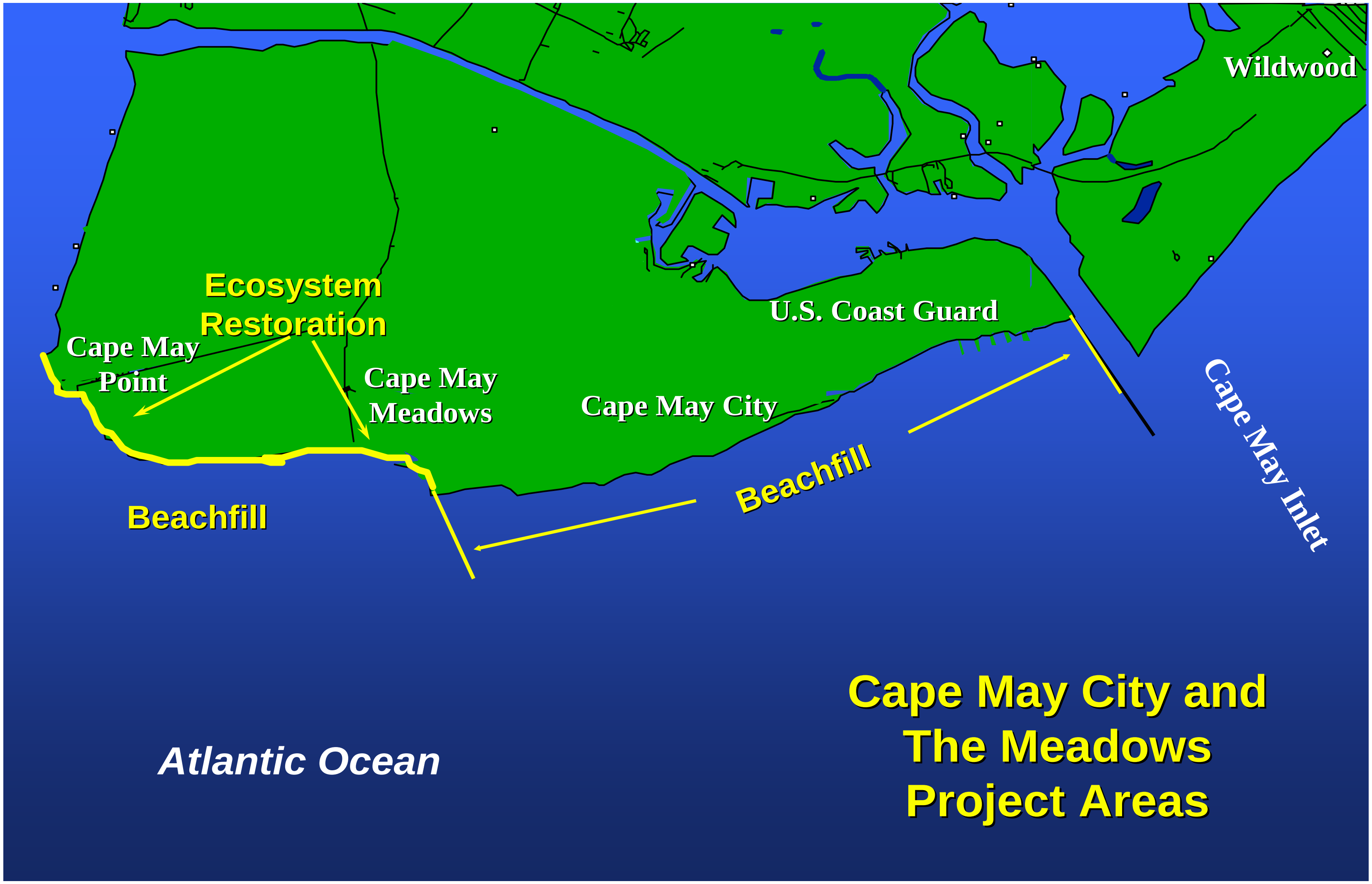

Figure 1 - Cape May City and Cape May Meadows (The Meadows) Project Areas

consisted of the control of 95 acres of *Phragmites australis*, planting 105 acres of emergent wetland vegetation, excavation of existing drainage ditches to restore freshwater flow, linking the hydrological segments of the project area, installing four water control structures, and the creation of 3 “piping plover” ponds behind the dune. Initial construction was completed using sand from Borrow Areas 4 and 5. Following initial construction, periodic nourishment was completed in 2009, 2011, 2013 and 2016. The next cycle of periodic nourishment is scheduled to take place in 2020. To date, approximately 2,485,000 cy of material have been placed on the beaches of The Meadows. This material has been obtained from a total of 3 offshore borrow areas (4, 5 and K) (See Figure 3).

Both projects are currently in the periodic nourishment phase with sand being placed every 2 years on the Cape May City beaches and every 4 years at The Meadows. These nourishment cycles coincide every 4 years and, when possible, the work is done at the same time to save on mobilization costs. Nourishment quantities for the projects will vary for each nourishment cycle as the amounts are based on current beach conditions and the amount of sand needed to restore the beach to the design profiles discussed above.

During the years since the Cape May project was initiated, the approved borrow area (M1) has failed to replenish itself with sand as previously expected. This is mainly due to a weak sand transport mechanism and a lack of supply. In addition, borrow areas 4 and 5 have been found to contain significant quantities of both fine grained and “cobble-sized” material, making them currently unsuitable for use as beachfill material. These borrow areas are at a depth at which normal wave and tidal currents are too weak to move appreciable amounts of coarse material in a short time period. There is also a limited supply of coarse grain material to feed the borrow areas. The shoals are detached from the nearshore littoral drift and from adjacent shoals. Influx of coarser sand to the borrow areas would be expected to occur only during major storms or over a long time period. It is currently estimated that approximately 3 million cy of sand is still available in Borrow Area K, however several challenges exist which reduce the ability of the USACE to cost effectively dredge that material. There are three magnetic anomalies in Borrow Area K that hinder a dredger's ability to remove sand near those anomalies for fear of damaging equipment. These anomalies are metal debris and were ruled out as having any cultural significance during the Phase I cultural assessment, but can still present an unknown hazard to the dredger. As a result these areas are avoided, excluding otherwise good material for beachfill. In addition, screening requirements for Munitions and Explosives of Concern and Unexploded Ordnance (MEC/UXO) have further introduced challenges to efficiently remove sand as there are areas within Borrow Area K that have a high density of larger gravel and seashells that clog the MEC/UXO dredge intake screens. This clogging can greatly decrease dredge efficiency and limit access to otherwise suitable beach quality sand below the coarser materials. For these reasons, and to fulfill the need for sand for these projects in the future, it was necessary to identify a new potential sand borrow source for the two projects. Recent vibracore and surface sampling efforts within the proposed borrow area expansion indicate minimal amounts of these larger materials are present and therefore should not have a significant impact on the effectiveness of the dredging.

1.1 Location

The beachfill placement area for Cape May extends along the coast of New Jersey from the USCG Training Center beach at Cape May Inlet to the 3rd Avenue groin in Cape May City. The beachfill placement area for The Meadows begins at the 3rd Avenue groin in Cape May City and extends to the Central Avenue groin in Cape May Point, at which point the fill transitions to tie into the existing beach and dune. The total length of fill for The Meadows is approximately 1.9 miles.

The borrow area identified as the current primary sand source for these projects, Borrow Area K, is located approximately 14,000 feet (2.6 miles) south of the Cape May jetties. The expansion of Borrow Area K is located immediately adjacent to the current borrow area (Figure 2).

2 PURPOSE AND NEED

As stated in USACE (1980), the purpose of the beachfill at Cape May is to reduce storm damages to the properties in Cape May City and at the US Coast Guard Training Center. Similarly, USACE (1998) reports that the purpose of beachfill at The Meadows is long-term ecosystem restoration with incidental storm damage reduction benefits. Both areas have been subjected to severe erosion, tidal inundation, wave attack and degradation since the implementation of the Federal navigation project at Cape May Inlet completed in 1911. The severe erosion resulted in the installation of numerous groins in both Cape May City and Cape May Point, as well as the subsequent placement of beachfill in Cape May City. Meanwhile, the erosion and breaching of the beach and dune and the subsequent degradation of the freshwater wetlands, has severely impacted The Meadows.

This document addresses the need to evaluate alternative sand sources to be utilized for the selected plans in USACE (1980 and 1998), berm and dune restoration. The need to evaluate alternative sources arose from the depletion of compatible sand in the previously used borrow areas.

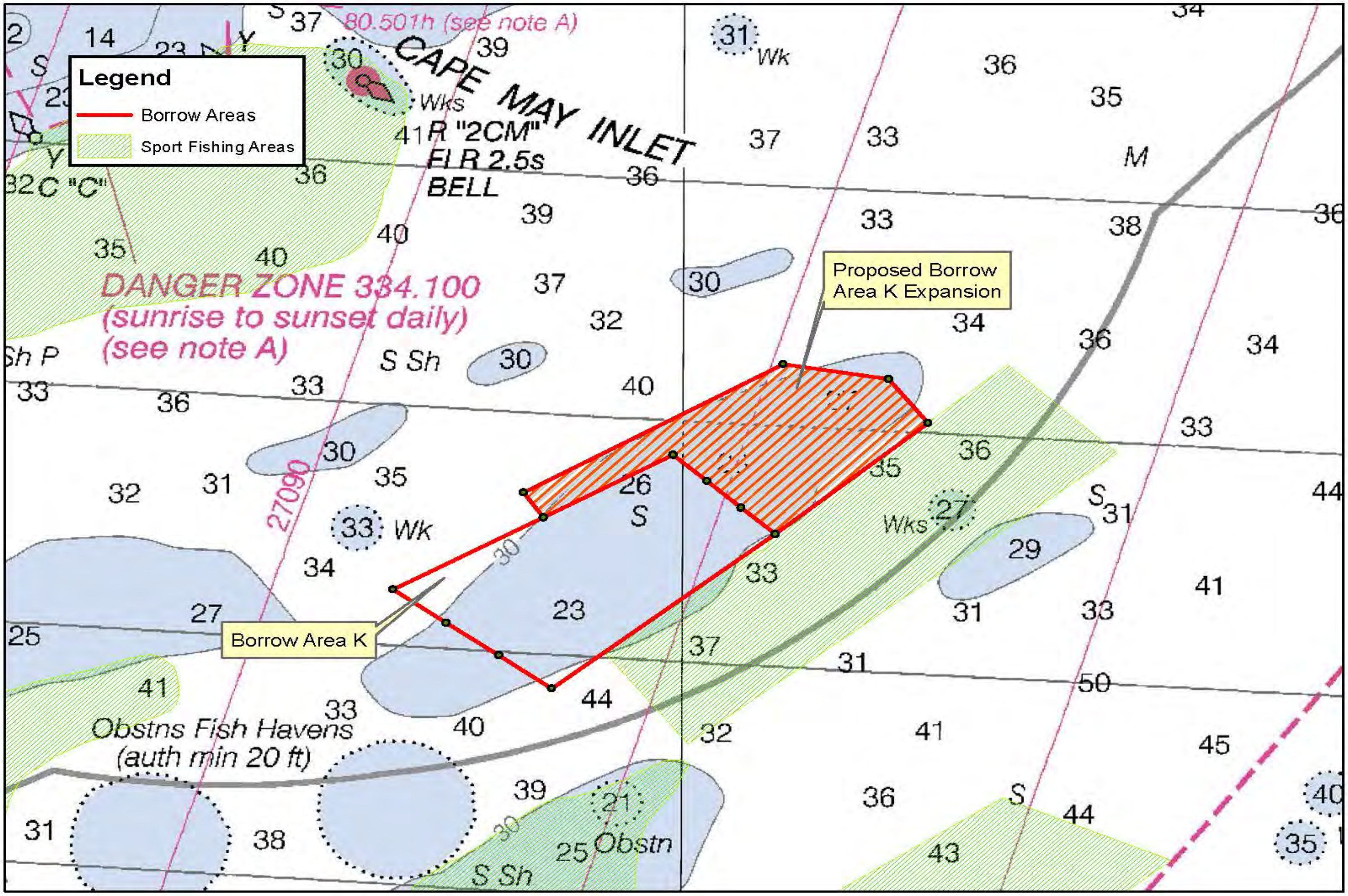

Figure 2 - Location of the existing Borrow Area K and expansion area

3 ALTERNATIVES

Within the offshore, inshore and nearshore areas between Cape May City and Cape May Point, numerous locations have been investigated as potential sources of borrow material for Cape May and The Meadows (USACE 1980,1998, 2002 and 2008). Table 1 summarizes these investigations and the current status of the potential borrow areas.

Initially, USACE (1980) identified four potential sources of beachfill material; Borrow Areas M1, M2, K and an island source designated as Borrow Area L, located in a dredged material disposal area adjacent to the Cape May Canal (Figure 3). M1 was ultimately chosen as a borrow source and was used for initial construction and 4 subsequent nourishment cycles. USACE 1983 and 1987 subsequently identified sand bypassing across the Cape May Inlet jetties as a renewable sand source for future nourishment cycles.

During the Reconnaissance Phase of investigation for The Meadows (USACE 1994), potential borrow areas identified during USACE 1980 were re-evaluated for compatibility and potential use for The Meadows. The results of the re-evaluation, with regard to available quantity, location, and grain size compatibility for The Meadows determined that Borrow Areas M2 and K were compatible sources of borrow material based on previous investigations and beach sampling. Borrow Areas M1 and L were rejected due to the fact that insufficient quantities were present in these areas to satisfy the long-term project needs. Borrow Area M2 was subsequently dropped after the discovery that the area fell within the boundaries of the Cape May Battery Site firing fan and therefore has the potential (though slight) to contain the danger of unexploded ordnance within its boundaries. Borrow Area K was eliminated at the time for financial reasons.

As a result of the elimination of these potential borrow areas during the Reconnaissance Phase, additional borrow areas needed to be identified. For this reason, USACE 1998 identified two new potential areas, Borrow Areas P1 and P2. Borrow Area P2 was eliminated due to concerns regarding fisheries resources so it was again necessary to identify additional sources of compatible material for the proposed project. Based on coordination and guidance from NJDEP, Division of Fish and Wildlife, three additional areas were investigated as potential sand sources. These areas were identified as Borrow Areas 4 and 5 and Cape May Inlet (See Figure 3). Geotechnical investigations discovered that the sand within Cape May Inlet was not compatible with the sand on the beaches of Cape May Meadows and Cape May Point. Borrow areas 4 and 5 were found

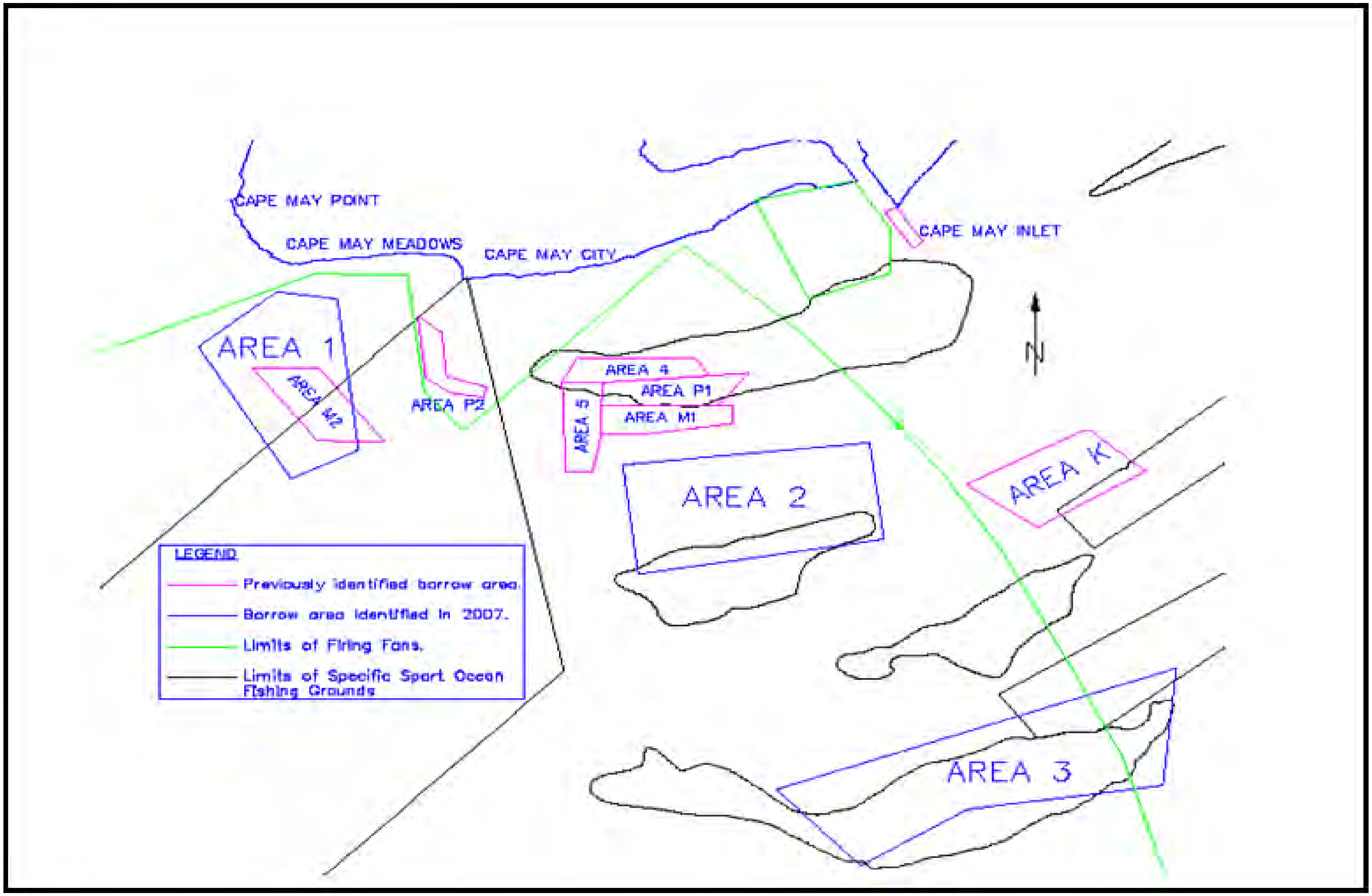

Figure 3 – Previously Investigated Borrow Areas

to be acceptable sources of sand from both an environmental and engineering standpoint and approximately 2,200,000 cy of material was removed from these sites during the initial construction of The Meadows and two Cape May nourishment cycles. Currently, suitable sand no longer exists within these borrow areas. Much of the surface of these areas is either very gravelly with some cobble size material or at the other extreme of the grain size spectrum and covered with silts and clays.

Since these previously used borrow areas no longer had suitable quantities of acceptable beachfill material, it was once again necessary to investigate alternative offshore areas as potential borrow sources. Four borrow areas, identified as 1, 2, 3 and K underwent benthic, cultural and geotechnical evaluations in 2007. These investigations indicated that all four areas would be acceptable for use for the two Cape May projects. Only Borrow Area K was pursued at the time however because the other areas are all within the historical artillery firing fans of the WW II era Fort Miles complex which include the artillery batteries that fired out of Cape May as well as Cape Henlopen. Due to potential safety issues, NJDEP requested that the USACE not use any borrow areas that fall within historic firing fans.

As previously discussed Borrow Area K is currently being used for periodic nourishment cycles for the two Cape May projects. Borrow Area K is located approximately 14,000 feet (2.6 miles) south of the Cape May jetties. The expansion of Borrow Area K is located immediately adjacent to the current borrow area.

Table 1 - History of Borrow Area Investigations in the Cape May Vicinity

Borrow Area	Planning/NEPA Document	Project	Current Status
M2	USACE 1980 & 1994	Cape May & The Meadows	(Falls inside of Borrow Area 1) Not currently being considered due to presence of important finfish habitat in ½ the borrow area and being located within a historic firing fan.
M1	USACE 1980 &1994	Cape May & The Meadows	Sand source has been depleted after use for initial construction and 4 nourishment cycles for Cape May.
K	USACE 1980, 1994, & 2008	Cape May & The Meadows	Previously eliminated in favor of closer borrow areas. Currently being used for both projects but has issues with accessing the rest of the available sand.
L	USACE 1980 & 1994	Cape May & The Meadows	Rejected due to the fact that insufficient quantities were present to satisfy long-term project needs and the logistics of moving sand by truck to the beach.
Cape May Inlet	USACE 2002	Cape May & The Meadows	Originally eliminated because sand was not compatible with target beaches. New analysis indicates presence of suitable sand. Area was used for Cape May nourishment in 2007.
P1	USACE 1998	The Meadows	Some fisheries concerns but available for future use. Currently unavailable due to NJDEP's ban on use of areas within historic firing fans.
P2	USACE 1998	The Meadows	Eliminated due to concerns regarding fisheries resources.
1	USACE 2008	Cape May & The Meadows	(Expansion of Borrow Area M2) Currently unavailable due to NJDEP's ban on use of areas within historic firing fans.
2	USACE 2008	Cape May & The Meadows	Currently unavailable due to NJDEP's ban on use of areas within historic firing fans. Portion of area falls within Prime Fishing Areas.
3	USACE 2008	Cape May & The Meadows	Currently unavailable due to NJDEP's ban on use of areas within historic firing fans. Most of area falls within Prime Fishing Areas.
4	USACE 2002	Cape May & The Meadows	Previously used as borrow material for both projects. Currently does not contain enough suitable material due to presence of both fine and coarse grained material.
5	USACE 2002	Cape May & The Meadows	Previously used as borrow material for both projects. Currently does not contain enough suitable material due to presence of both fine and coarse grained material.

3.1 Borrow Area Expansion

The USACE is proposing to expand the current Borrow Area K from 430 acres to 742 acres in order to have more sand available for upcoming and future nourishment cycles (Figure 2). Overall, there is limited suitable sand available within the project area. Previous dredging in Borrow Area K resulted in lower production rates than originally anticipated, which may be due to water depth, distance from placement area and some oversized material on the sea floor clogging the Munitions and Explosives of Concern (MEC) avoidance intake screens. These conditions slow down the dredging process, hinder the success of the project, reduce the amount of usable sand and increase project costs. In addition, the magnetic anomalies and high density larger gravel and seashells currently found in Borrow Area K limit access to the material remaining in the borrow area.

The expansion of Borrow Area K is approximately 312 acres and is immediately adjacent to Borrow Area K, ranging from 13,000 to 16,500 feet offshore of Cape May Inlet. Current elevations within the borrow area expansion range from -28 feet NAVD 88 to -38 feet NAVD 88. Due to the distance between Borrow Area K and the placement area, Borrow Area K is typically dredged with a hopper dredge. The proposed increase in the size of the borrow area will greatly improve the efficiency of how the material is removed as the hopper dredges will have fewer passes through the site as they work to fill the hopper. The expansion of Borrow Area K, allowing a maximum allowable removal depth of -40 feet NAVD 88, will provide approximately 4.2 million cy of additional sand for beachfill operations for the two Cape May Projects.

3.2 No Action

The no action alternative would consist of not expanding Borrow Area K and continuing to use the remaining sand in the previously approved borrow area. Since very limited available quantity remains in Borrow Area K, additional sand sources would be required to successfully nourish these projects in the future. In order to find additional sand sources for the projects, it could be necessary to revisit areas that were previously thrown out for environmental and safety reasons. The no action alternative jeopardizes the continued success of these projects.

4 AFFECTED ENVIRONMENT

USACE (1980 and 1998) provided a comprehensive discussion on affected resources within the project areas. A review of the affected environmental resources was conducted in the subsequent NEPA documents (USACE 2002 and 2008) and were updated as necessary. Any significant changes were discussed in those documents and are incorporated by reference. Resource topics not affected by the proposed borrow area expansion do not require further discussion in the current EA and are incorporated by reference.

4.1 Air Quality

The previous NEPA documents 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. The New Jersey Division of Air Quality also regulates the emissions of hazardous air pollutants (HAPs) designated by the U.S. EPA (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 four highest daily maximum 8-hour average concentrations recorded each year for three years. Their classification with respect to the 8-hour standard is shown in Figure 4. 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 entire state of New Jersey is in non-attainment for ozone.

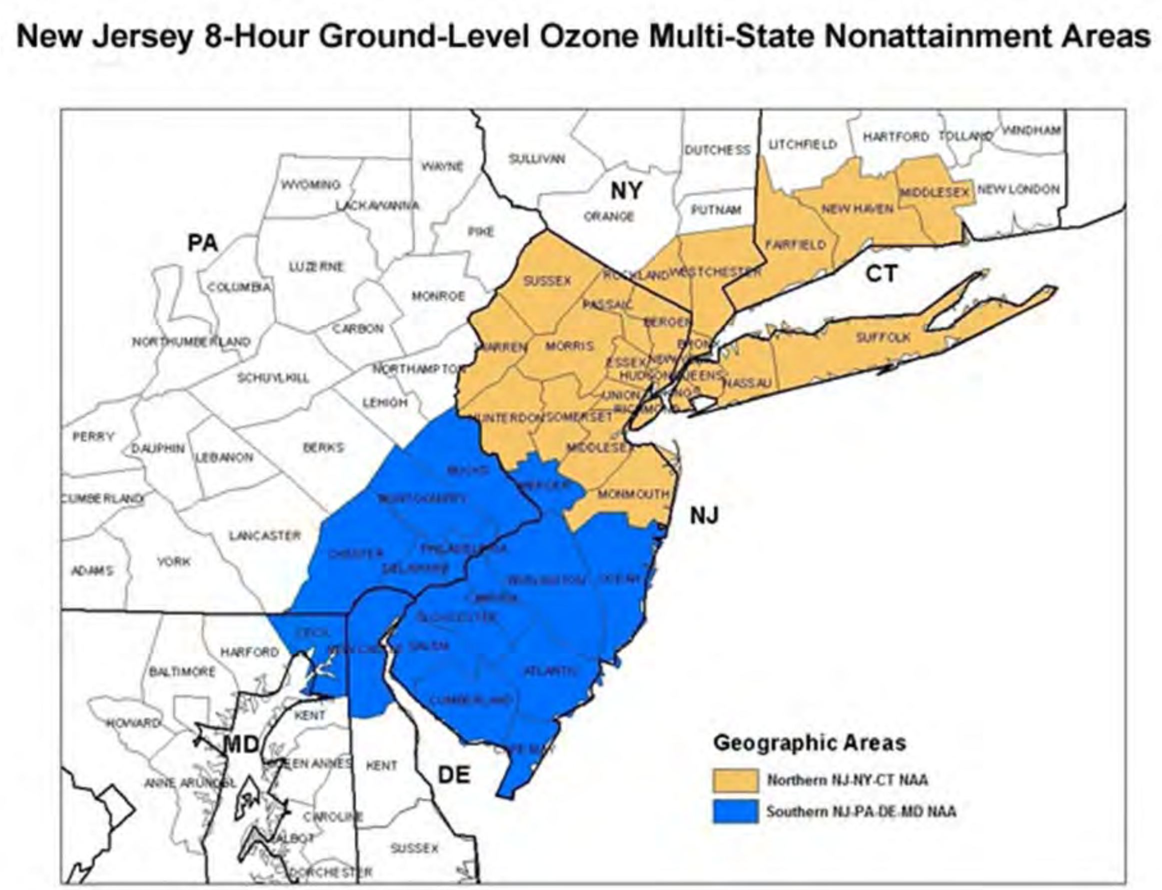

Figure 4- **New Jersey Non-Attainment Areas for Ozone (Source: NJDEP, 2017)**

4.2 Water Quality

Water quality within the project area was discussed in USACE (1980, 1998, 2002, and 2008). Versar (2012) measured water quality in Borrow Area K and the expansion area in June 2011. 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.

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.

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.

4.3 Fisheries

4.3.1 <u>Shellfish</u>

Shellfish resources within the project affected area were described most recently in USACE (2002 and 2008). 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.

Borrow area K was originally surveyed in 2007 to document the presence and abundance of juvenile surfclams (Versar, 2008). NJDEP has been conducting surf clam surveys off the coast of New Jersey since 1988. During that time, Borrow Area K was sampled 5 times with an average catch of 7.1 bushels/100 m^2. In the 2007 Versar sampling effort, juvenile and small adult surfclams were collected in 52% of the stations sampled within Borrow Area K. The mean number of juvenile surfclams was approximately 1.5 clams per grab (equivalent to 35/m^2) and the abundance of clams was not significantly different between the 4 borrow areas sampled at that time. Mean biomass was also low, similar to result obtained from other sampling efforts in this area. Due to historically low densities of surfclams in the Cape May region, NJDEP, Bureau of Shellfisheries agreed with the USACE that additional adult surfclam dredge tows were not necessary in these borrow areas at that time. Adult surfclam sampling was not conducted in the expansion of Borrow Area K since previous USACE studies within the Cape May area consistently resulted in low surfclam densities (Versar, 2000, 2005, and 2008). Additionally, annual surfclam surveys conducted by NJDEP have historically documented low surfclam densities in the Cape May area. During the benthic grab sampling conducted by Versar in 2011, only 6 of the 17 stations contained juvenile surfclams and only two grabs had five or more surfclams. The mean number juvenile surfclams collected in the expansion area of Borrow Area K was 1.8 clams per grab (equivalent to about 41/ m^2) and all of them were less than 2 cm in length. This mean abundance is similar to the low numbers of juvenile clams collected in previous studies in the region (Figure 5).

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 along the coast of New Jersey over the years, but tended to have the higher densities closer to Absecon and Barnegat Inlets and lower densities in the Cape May area. To evaluate sampling areas that at any one point in time had high surfclam densities, the maximum density per area observed in the entire database were mapped. Based on this, the highest number of clams sampled from Borrow Area K and the expansion area is relatively low at 10 bushels/100m^2 or less (Figure 6).

4.3.2 **Finfish**

The species composition of finfish in the project area has not changed significantly since it was discussed in USACE (2008). However, the habitat for finfish may be altered by the proposed expansion of Borrow Area K.

4.3.3 **Prime Fishing Areas**

Several locations within or near the project area are classified as Prime Fishing Areas (NJAC 7:7E-3.4) by NJDEP (See Figure 2). One of these features lies immediately adjacent to Borrow Area K and the expansion area. Prime Fishing Areas in New Jersey were originally delineated by Long and Figley (1984) in a publication titled “New Jersey’s Recreational and Commercial Ocean Fishing Grounds”. The mapping was updated by the NJDEP in 2003 when they surveyed charter boat, party boat and private boat captains to identify the areas they consider recreationally significant fishing areas. This survey data was used as a basis for the mapping of these areas (NJDEP website: http://www.nj.gov/dep/gis/digidownload/metadata/statewide/sportfishing.htm). Prime Fishing Areas include tidal water areas and water’s edge areas, which

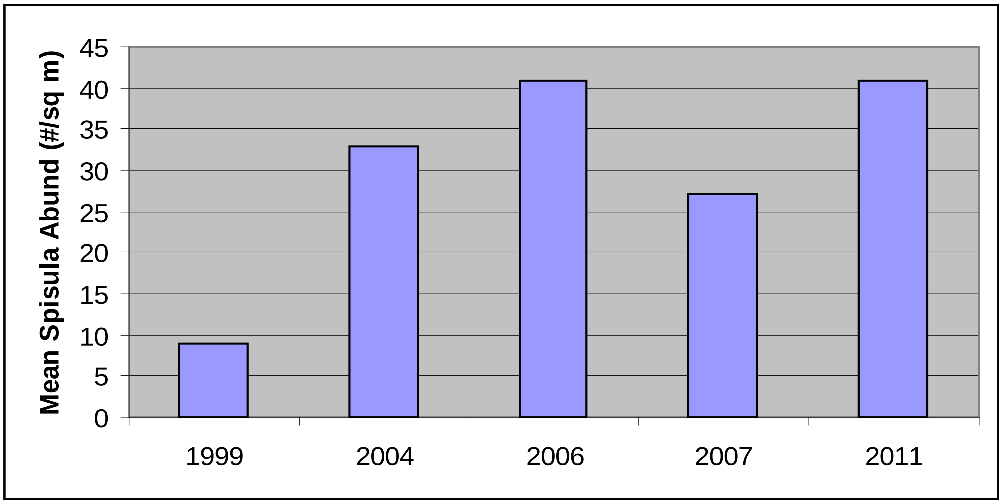

Figure 5 - **Mean abundance of juvenile surfclams collected from previously sampled Borrow Areas (Borrow Areas 4 and 5) in 2006, 2004, and 1999 (Versar, 2008). Borrow Area K in 2007 (Versar, 2008) and the current Expansion Area K**

have a demonstrable history of supporting a significant local quantity of recreational or commercial fishing activity. Other fish habitats of value, within the study area include artificial reefs, wreck sites, groins and jetties. No prime fishing habitat has been delineated in the expansion of Borrow Area K.

4.3.4 <u>Essential Fish Habitat</u>

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 study area contains EFH for various life stages for 30 species of managed fish and shellfish. Table 2 presents the managed species and their life stage that have been identified within the study area. The habitat requirements for identified EFH species and their representative life stages are provided in Table 3. USACE (2008) provided an evaluation of EFH in the project area. The expansion of Borrow Area K falls within the area previously evaluated and coordinated with NMFS but the tables have been updated to include the most recent species information.

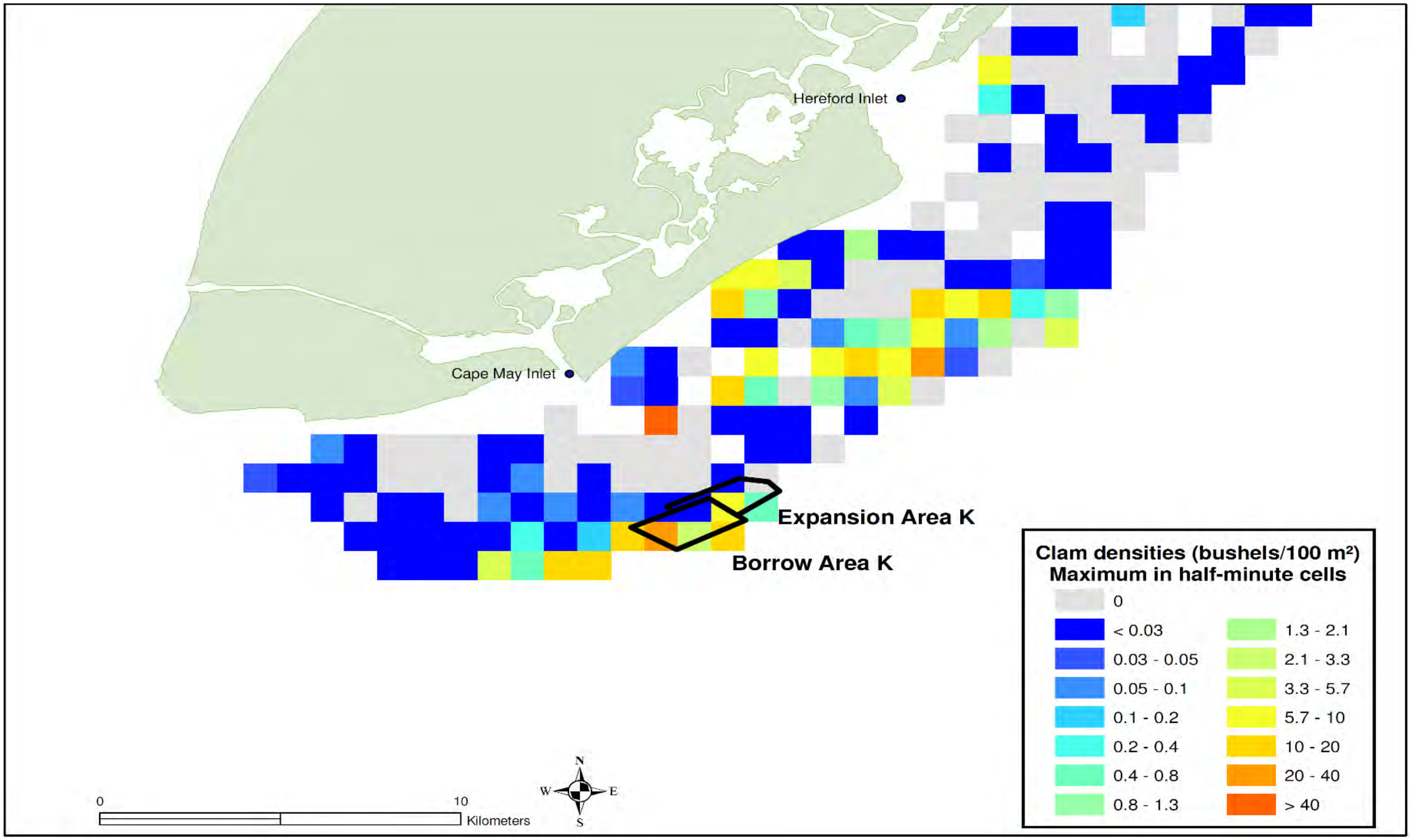

Figure 6 - Maximum surfclam densities observed near the Expansion Area K and previously dredged Borrow Area K. Data ranges are the maximum densities (bushels/100 m2) observed in sampling grids surveyed between 1988 and 2006 by NJDEP.

Table 2 - SUMMARY OF SPECIES WITH EFH DESIGNATION IN THE PROJECT AREA (NOAA, 2018)

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Atlantic butterfish (*Peprilus tricanthus*)			X	X
Red hake *(Urophycis chuss)*	X	X	X	
White hake (*Urophycis tenuis)*	X			
Silver hake/whiting (*Merluccius bilinearis*)	X	X	X	
Little skate (*Raja erinacea*)			X	X
Winter skate (*Raja ocellata*)			X	
Clearnose skate (*Raja eglanteria*)			X	X
Windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*			X	X
Monkfish *(Lophius americanus)*	X	X		
Bluefish *(Pomatomus saltatrix)*			X	X
Long finned squid *(Loligo pealei)*	X		X	X
Short finned squid *(Illex ilecebrosus)*	n/a	n/a		
Bluefish (*Pomatomus saltatrix*)			X	X
Summer flounder *(Paralicthys dentatus)*		X	X	X
Scup *(Stenotomus chrysops)*			X	X
Black sea bass *(Centropristus striata)*			X	X
Surfclam *(Spisula solidissima)*			X	X
Skipjack Tuna (*Katsuwonus pelamis*)				X
Spiny dogfish *(Squalus acanthias)*			Sub male and female	X
King mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
Cobia *(Rachycentron canadum)*	X	X	X	X
Sand tiger shark (*Odontaspis taurus*)		Neonates	X	X
Atlantic angel shark (*Squatina dumerili*)		Neonates	X	X
Common thresher shark (Alopias vulpinus)		Neonates	X	X
Dusky shark *(Charcharinus obscurus)*		Neonates		
Sandbar shark *(Charcharinus plumbeus)*		Neonates	X	X
Sandbar shark *(Charcharinus plumbeus)*		HAPC	HAPC	HAPC
Tiger shark *(Galeocerdo cuvieri)*			X	X
Smoothhound shark (*Mustelus mustelus*)		neonates	X	X

The project area includes waters within the Atlantic Ocean surrounding Cape May, N.J., from east of Wildwood Crest, NJ., south around the tip past **Cape May Inlet**, Sewell Pt., Cape May, NJ., Cape May Pt., Cape May Canal, up to just north of North Cape May, NJ. The waters within this square affect THE New Jersey Inland Bay estuary and the following as well: Overfalls Shoal, Eph Shoal, McCrie Shoal, Prissy Wicks Shoal, Middle Shoal, North Shoal, Cape May Channel, Bay Shore Channel, Cape May Harbor, Skunk Sound, Cape Island Creek, Middle Thorofare, Jarvis Sound, Jones Creek, Swain Channel, Taylor Sound, Sunset Lake, and Richardson Channel. The waters on the northwest corner of the square, just south and just west of the tip of the cape, are found within the salt water salinity zone of the Delaware Bay estuary.

Table 3 - HABITAT UTILIZATION OF IDENTIFIED EFH SPECIES FOR REPRESENTATIVE LIFESTAGES WITH EFH DESIGNATION IN THE PROJECT AREA (NOAA, 2018)

Table 3

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
White hake (*Urophycis tenuis*)	**Habitat:** Occur near the surface in pelagic habitats			
Red hake *(Urophycis chuss)*	**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 microcrustaceans 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).	
Silver hake/whiting (*Merluccius bilinearis)*	**Habitat:** Pelagic habitats from the Gulf of Maine to Cape May, New Jersey	**Habitat**: Pelagic habitats from the Gulf of Maine to Cape May, New Jersey	**Habitat:** Pelagic and benthic habitats including the coastal bays and estuaries, and on the continental shelf at depths greater than 10 meters in coastal waters in the Mid-Atlantic and between 40 and 400 meters on the continental shelf in the Mid- Atlantic, on sandy substrates. Juvenile silver hake are found in association with sand-waves, flat sand with amphipod tubes, and shells, and in biogenic depressions.	
Windowpane flounder *(Scopthalmus aquosus)*	**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)*			**Habitat:** Pelagic waters and bottom, < 10 C and 15-130 m depths **Prey:** zooplankton (copepods, decapod	**Habitat:** Pelagic waters and bottom habitats; **Prey:** chaetognath, euphausiids, pteropods and copepods.

Table 3				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			larvae, cirriped larvae, cladocerans, and pelecypod larvae)	
Monkfish *(Lophius americanus)*	**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 (copepods, crustacean larvae, chaetognaths)		
Bluefish *(Pomatomus saltatrix)*			**Habitat:** Pelagic waters of continental shelf and in Mid Atlantic estuaries from May-Oct. **Prey:** Squid, smaller fish	**Habitat:** Pelagic waters; found in Mid Atlantic estuaries April – Oct. **Prey:** Squid, smaller fish
Long finned squid *(Loligo pealei)*	**Habitat:** Egg masses are demersal in polyhaline waters <50 m in depth and 10-23°C, and are commonly found attached to rocks and small boulders on sandy/muddy bottom and on aquatic vegetation.		**Habitat**: Pre-recruits are pelagic, and inhabit upper 10 m at depths of 50-100 m on continental shelf. Pre-recruits are found in coastal inshore waters in spring/fall, offshore in winter. **Prey**: euphausiids, arrow worms, small crabs, polychaetes and shrimp	**Habitat:** Adult recruits are demersal during the day, and pelagic at night, and inhabit the continental shelf and upper continental slope in seasonally variable depths to depths of 400 m. Adults may occur in depth of 110-200 m in the spring, but may migrate to inshore waters as shallow as 6 m in the summer and autumn. In the winter, adults migrate offshore to depths of 365 m. **Prey: f**ish (silver hake, mackerel, herring, menhaden, sand lance, bay anchovy, weakfish, and silversides) and other squid larvae/juveniles.
Short finned squid *(Illex ilecebrosus)*	**Habitat:** Egg masses are demersal and hatch in 8-16 days at temperatures between 12.5 and 21°C	**Habitat:** Larvae hatch at approximately 1.1mm mantle length most abundant in February and March		
Atlantic butterfish *(Peprilus tricanthus)*			**Habitat:** Pelagic waters in 10 – 360 m	**Habitat:** Pelagic waters **Prey:** Jellyfish, crustaceans, worms, small fish
Summer flounder *(Paralicthys dentatus)*		**Habitat:** Pelagic waters, nearshore at depths of 10 – 70 m from Nov. – May	**Habitat:** Demersal waters (mud and sandy substrates) **Prey:** Mysid shrimp	**Habitat:** Demersal waters (mud and sandy substrates). Shallow coastal areas in warm months, offshore in cold months **Prey:** Fish, squid, shrimp, worms
Scup *(Stenotomus chrysops)*			**Habitat:** Demersal waters	**Habitat:** Demersal waters offshore from Nov – April

Table 3				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
				Prey: Small benthic invertebrates
Black sea bass *(Centropristus striata)*			**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 **Prey:** Benthic and near bottom inverts, small fish, squid
Surfclam *(Spisula solidissima)*			**Habitat:** Throughout bottom sandy substrate to 3' in depth from beach zone to 60 m	**Habitat:** Throughout bottom sandy substrate to 3' in depth from beach zone to 60 m
Skipjack Tuna (*Katsuwonus pelamis*)				**Habitat:** The skipjack tuna is an epipelagic fish, occurring in waters ranging in temperature from 14.7 to 30°C. While skipjacks remain at the surface during the day, they may descend to depths of 260 m at night. **Prey:**
Spiny dogfish *(Squalus acanthias)*			**Habitat: D**emersal by day, but may vertically migrate at night to feed. Spiny dogfish prefer muddy/silty and sandy bottoms in polyhaline baymouths and continental slope waters in depths of 1-500 m. **Prey:** Flatfishes, blennies, sculpins,capelin, ctenophores, jellyfish, polychaetes,sipunculids, amphipods, shrimps, crabs, snails,octopods, squids, and sea cucumbers	**Habitat:** Demersal by day, but may vertically migrate at night to feed. Spiny dogfish prefer muddy/silty and sandy bottoms in polyhaline baymouths and conteninital slope waters in depths of 1-500 m. **Prey:** Flatfishes, blennies, sculpins,capelin, ctenophores, jellyfish, polychaetes,sipunculids, amphipods, shrimps, crabs, snails,octopods, squids, and sea cucumbers
King mackerel *(Scomberomorus cavalla)*	**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.	**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 **Prey:** Zooplankton, 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 **Prey:** Zooplankton, shrimp, crab larvae, squid, herring	**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
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	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from	**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

Table 3				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
	shelf break zone. Migratory	the surf to the shelf break zone. Migratory **Prey:** Zooplankton, fish eggs	the surf to the shelf break zone. Migratory **Prey:** Zooplankton, shrimp, crab larvae, squid, herring	shelf break zone. Migratory **Prey:** Squid, herring, silverside, 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.	**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, shrimp, small fish	**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, shrimp, small fish
Little skate (*Raja erinacea*)			**Habitat:** Intertidal and sub-tidal benthic habitats in coastal waters extending to a maximum depth of 80 meters, and including high salinity zones in the bays and estuaries. EFH for juveniles occurs on sand and gravel substrates, but they are also found on mud **Prey:** Benthic macrofauna primarily decapod crustaceans, amphipods and polychaetes	**Habitat:** Intertidal and sub-tidal benthic habitats in coastal waters extending to a maximum depth of 80 meters, and including high salinity zones in the bays and estuaries. EFH for juveniles occurs on sand and gravel substrates, but they are also found on mud **Prey:** Benthic macrofauna primarily decapod crustaceans, amphipods and polychaetes
Winter skate (*Raja ocellata*)			**Habitat:** Sub-tidal benthic habitats in coastal waters from the shoreline to a maximum depth of 90 meters including the high salinity zones of the bays and estuaries. EFH occurs on sand and gravel substrates, but they are also found on mud **Prey:** Polychaetes and amphipods are the most important prey items in terms of numbers or occurrence, followed by decapods, isopods, bivalves, and fishes	**Habitat:** Sub-tidal benthic habitats in coastal waters from the shoreline to a maximum depth of 90 meters including the high salinity zones of the bays and estuaries. EFH occurs on sand and gravel substrates, but they are also found on mud **Prey:** Polychaetes and amphipods are the most important prey items in terms of numbers or occurrence, followed by decapods, isopods, bivalves, and fishes
Clearnose skate (*Raja egianteria*)			**Habitat:** Found soft bottoms but also on rocky or gravelly bottoms **Prey:** Amphipods, mysid shrimp, rock crabs, razor clams, juvenile flounder, croaker and spot	**Habitat:** Found soft bottoms but also on rocky or gravelly bottoms **Prey:** Amphipods, mysid shrimp, rock crabs, razor clams, juvenile flounder, croaker and spot

Table 3				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
Sand tiger shark *(Odontaspis taurus)*		**Neonate Habitat:** Shallow coastal waters, bottom or demersal	**Habitat:** Shallow coastal waters, bottom or demersal	**Habitat:** Shallow coastal waters, bottom or demersal **Prey**: Crabs, squid, small fish
Atlantic angel shark (*Squatina dumerili*)		**Neonate Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters, bottom (sand or mud near reefs)
Common thresher shark (*Alopias vulpinus*)		**Neonate Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters
Dusky shark *(Charcharinus obscurus)*		**Neonate Habitat:** Shallow coastal waters		
Sandbar shark *(Charcharinus plumbeus)*		**Neonate Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters
Tiger shark *(Galeocerdo cuvieri)*			**Habitat:** Shallow coastal waters to the 200 meter isobath	**Habitat:** Shallow coastal waters to the 200 meter isobath
Smoothhound shark (*Mustelus mustelus*)		**Neonate Habitat:** Shallow coastal waters		

4.4 Benthos

Benthic macroinvertebrates of the offshore zone within borrow area K was described in USACE (2008). A benthic-sediment assessment was conducted focusing on infauna species within Borrow Area K to establish a baseline for the benthic macroinvertebrate assemblages within the areas (Scott and Bruce 2008). According to Scott and Bruce 2008, the borrow areas sampled did not contain unique or rare macroinvertebrate communities that would preclude their use as a sand borrow source for beach placement activities. The benthic community in Borrow Area K was also similar to other benthic communities found in and along the New Jersey Coast.

In 2011, Versar conducted benthic sampling in the expansion area of Borrow Area K as well as five previously sampled stations in the original Borrow Area K. A cluster analysis was conducted to investigate community patterns for all of the stations sampled. The stations fell into three distinct cluster groups based on abundances of individual taxa. The dominant taxa present in each group was the epifaunal Ascidiacea, a class of sessile tunicates that attach to sand grains but are too small to identify beyond the class level (Versar, 2012). When reviewing the results of the five revisited sites from the original Borrow Area K, it was determined that the benthic communities were not different from the communities collected in the expansion area.

4.5 Rare Threatened and Endangered Species

USACE (2008) most recently provided a discussion of all of the rare, threatened and endangered species within the affected areas. The Federally listed (threatened) and state listed (endangered) piping plover (*Charadrius melodus*) has historically nested within the project area but the last nesting occurrence was in 2014 in Lower Cape May Meadows and 2013 at the Coast Guard Station in Cape May City.

The Federally listed (threatened), 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).

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. The 2004 U.S. Fish and Wildlife Service (USFWS) Survey and Monitoring Report for seabeach amaranth indicated that 6 plants were found in at the Coast Guard Station in Cape May. No seabeach amaranth has been found in the project area since that time.

The New York Bight population of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is currently 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.

The National Marine Fisheries Service (NMFS) also has jurisdiction over four (4) Federally-designated sea turtles: the endangered leatherback (*Dermochelys coriacea*), Kemp's Ridley (*Lepidochelys kempii*), and green (*Chelonia mydas*) sea turtles, and the threatened loggerhead (*Caretta caretta*) sea turtle. These sea turtles may be found in New Jersey's continental shelf waters, inshore bays and estuaries from late spring to mid-fall. Sea turtles feed primarily on mollusks, crustaceans, sponges and a variety of marine grasses and seaweeds. The endangered leatherback sea turtle may forage on jellyfish, as well.

Federally endangered finback whales (*Balaenoptera physalus*) are the most common whales to occur in New Jersey coastal waters. Finback whales increase in relative abundance in late winter and spring, east of the Delaware peninsula, but may be found in New Jersey coastal waters in all seasons. The endangered humpback (*Megaptera novaeangliae*) and right whales (*Eubalaena spp.*) are known to occur in the nearshore waters of the mid-Atlantic on a seasonal basis, and may be found within the vicinity of the proposed borrow area(s) from late winter through early spring.

4.6 Noise

USACE (2008) 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 the communities in the study area, 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.

4.7 Cultural Resources

The Philadelphia District has conducted several cultural resources investigations in association with both the Cape May Inlet to Lower Township Storm Damage Reduction Project and the Lower Cape May Meadows - Cape May Point Environmental Restoration Project. In 1980, the District evaluated the potential environmental impacts associated with the construction of the Cape May Inlet to Lower Township Storm Damage Reduction Project, and prepared a Final Supplement to the Final Environmental Impact Statement (EIS). In preparation for this work, a Phase 1A cultural resources investigation was completed (Gilbert Commonwealth, 1979). Researchers identified several previously documented significant cultural resources within the communities of Cape May and Cape May Point. A follow-up Phase 2 underwater investigation of Borrow Area M1 was conducted by Kardas and Larrabee in 1982. This investigation documented known shipwreck locations off the south New Jersey coastline and noted a high shipwreck concentration centered near Cape May Inlet. Several remote sensing targets exhibiting shipwreck characteristics were identified within Borrow Area M1 and have been subsequently avoided during sand placement activities in Cape May.

In 1998, the District similarly evaluated the potential environmental impacts associated with proposed environmental restoration activities at the Lower Cape May Meadows (The Meadows) and Cape May Point. In preparation for this project, the USACE conducted a Phase 1 cultural resources investigation in 1997 (Dolan Research, Inc. and Hunter Research, Inc., 1997). Structures associated with World War II era fortifications and surface debris associated with the second Cape May Lighthouse site were identified. Researchers considered these cultural resources potentially eligible for listing in the National Register of Historic Places. No significant remote sensing targets were identified in proposed Borrow Areas P1 and P2.

Cultural resources surveys were also conducted in 2000 on Borrow Areas 4 and 5 (Dolan Research, Inc. 2000). No significant remote sensing targets were identified.

Three potentially significant submerged cultural resources were previously identified in Borrow Area K. In order to maximize the use of available sand in the borrow area, additional underwater archaeological investigations were performed to determine if the targets were culturally significant. The results of the additional investigations revealed the targets to be modern debris.

In preparing this Environmental Assessment, the USACE consulted with the New Jersey State Historic Preservation Office (NJ SHPO) and other interested parties to identify and evaluate historic properties in the proposed expansion of Borrow Area K. In order to fulfill its responsibilities under the National Historic Preservation Act of 1966, as amended, and its implementing regulations 36 CFR Part 800, the USACE conducted submerged cultural resources investigations in the expansion area. Phase 1 Underwater and Shoreline Archaeological Investigations were performed within the expansion of Borrow Area K, in conjunction with plans to replenish beaches in Cape May County, New Jersey (Dolan Research, Inc. 2013). Comprehensive remote sensing survey of the borrow area using magnetic and acoustic instrumentation resulted in the identification of 35 magnetic and sonar targets. However, none of these 35 targets generated remote sensing signatures suggestive of potentially significant submerged cultural resources. All of the 21 magnetic targets generated featured low intensity, limited duration signatures typically associated with single-source objects. Sonar records confirmed the presence of 14 isolated targets; linear, rectangular, and rounded objects. None of the sonar images appeared to be associated with a potentially significant submerged cultural resource. As such, no further archaeological investigations are recommended and no restrictions relating to cultural resources will be required within the borrow area.

5 ENVIRONMENTAL IMPACTS

USACE (2008) most recently provided a comprehensive discussion on the direct, indirect and cumulative effects of the overall beachfill project and Borrow Area K. The impacts discussed in this document relate only to the expansion of Borrow Area K. Resource topics with impacts that do not require further discussion are incorporated by reference (USACE, 1980, 1998, 2002 and 2008).

5.1 Mineral Resources

As discussed previously, the Cape May City project has 23 years remaining in the 50-year project life while the Lower Cape May Meadows has 37 years remaining. In order to fulfill the project requirements, additional sand resources will be needed for future nourishment activities. Although sand resources will be removed from the borrow site(s), the sand will be redistributed to the shoreline and littoral system. Therefore, this does not result in a permanent consumptive loss of this resource. In addition, since the nourishment quantities are only estimates of what may be needed in the future, actual sand requirements may be lower as only areas that fall below the design template will be filled during nourishment activities.

It is estimated that approximately 4.2 million cubic yards (cy) of sand is available in the expansion area of Borrow Area K to be used for periodic nourishment. Based on vibracore data, similar substrate characteristics would remain following dredging. Because portions of the borrow area would be deepened with each dredging cycle, minor and localized changes in hydrodynamics are expected in the vicinity of the dredging. Over the life of the project, the expansion of Borrow Area K will be lowered to an elevation of approximately –40 feet NAVD 88, with cuts ranging between 2 and 12 feet. It is expected that the excavation impacts of the expansion of Borrow Area K will be no different from impacts previously discussed in USACE (1980, 1998, 2002 and 2008) for the other project borrow areas. The use of the expansion of Borrow Area K will not result in more sand being dredged for the project.

5.2 Air Quality

Air quality impacts resulting from the release of carbon monoxide and particulate emissions will occur at the site during project related activities. Exhaust from the construction equipment will have an effect on the immediate air quality around the construction operation but should not impact areas outside of 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 Cape May City and Lower Cape May Meadows Projects, the Federal Action is to construct a berm and dune restoration project utilizing beachfill sand dredged from offshore sand sources (Borrow Area K and the expansion area). The U.S. Army Corps of Engineers, Philadelphia District would be responsible for construction. The Federal Action would take place in Cape May County, New Jersey, which is classified as marginal nonattainment for ozone (oxides of nitrogen [NOx] and volatile organic compounds [VOCs]). Cape May, NJ is within the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Nonattainment Area.

Recently, the Philadelphia District conducted a project emissions inventory for the use of Borrow Area K for an FCCE beachfill at Cape May City (Cape May Inlet to Lower Township), which was estimated to require 787,000 cubic yards of sand to be hydraulically dredged and placed on 4,818 l.f. of shoreline. The total VOC emissions were estimated at 3.7 tons, which is below the annual General Conformity *de minimis* threshold level of 50 tons/yr and, therefore, the action met the conformity requirement for the project.

Likewise, the total NOx emission estimate for the same project construction was estimated to be approximately 110 tons. However, the work was scheduled over two calendar years, and therefore, was below the 100 tons/year *de minimis* threshold. Based on this previous estimate, it is inferred that periodic nourishment or FCCE repairs requiring 500,000 cubic yards or less of sand obtained from the Borrow Area K expansion in a given calendar year is expected to result in *de minimis* discharges. If a future beachfill requires quantities higher than 500,000 cubic yards, a detailed emissions inventory will be conducted to determine if the project is below the 100 ton threshold per calendar year for NOx, or if General Conformity will be necessary. A Record of Non-Applicability (RONA) and emissions estimate is provided in Appendix B as a typical scenario for utilizing the expansion of Borrow Area K.

5.3 Benthos of Offshore Borrow Areas

A discussion of impacts to the benthic community in the previously used borrow areas is provided in USACE (1980, 1998, 2002, and 2008). 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. A secondary disturbance would be the generation of turbidity and deposition of sediments on the benthic community adjacent to the dredging. Dredging will primarily involve the immediate loss of infaunal and some of the less mobile epifaunal organisms. These may include polychaetes (worms), mollusks (clams and snails), and crustaceans (amphipods and crabs). Despite the initial effects of dredging on the benthic community, recolonization is anticipated to occur relatively quickly. Saloman et al. 1982 determined that short-term effects of dredging lasted about one year, resulting in minor sedimentological changes, and a small decline in diversity and abundance within the benthic community. The recovery of a borrow area is dependent upon abiotic factors such as the depth of the borrow areas, and the rate of sedimentation in the borrow areas following the dredging. However, depending on the post-dredging conditions, recovery of the benthic community through abundance, diversity, and biomass can be variable by taking a few months to several years (Burlas, et. al., 2001; Lundquist et al. 2010). Benthic investigations in and around the expansion of Borrow Area K reveals benthic communities that are not unique or rare to the general project area. Recolonization of the benthic community may occur within 1-2 years following dredging, however, the effects of the two to four year periodic project maintenance over a 50 year project life may have more profound adverse effects if conducted at the same locations. Measures that would minimize the effects of dredging in the borrow areas include dredging in a manner as to avoid the creation of deep pits, alternating locations of periodic dredging, dredging during lowest biological activity, and the utilization of a hydraulic dredge with a pipeline delivery system to help minimize turbidity.

The most dominant species found in the expansion area of Borrow Area K, the epifaunal Ascidiacea, was found in the greatest numbers in the portion of the borrow area with the highest amount coarser sand particles.   A cluster analysis was conducted with the benthic results to investigate community patterns within the expansion of Borrow Area K and some previously dredged areas in the original Borrow Area K. The sampling stations fell into three distinct cluster groups based on abundances of individual taxa. The benthic community patterns exhibited by each cluster group was also related to the sediment microhabitats, matching the sediment characteristics of different portions of the borrow area (Figure 7). Stations falling within the pink cluster group had the highest amount of coarser sand particles and were located in the northern portion of the expansion area. Stations falling within the yellow cluster group contained higher proportions of finer sand particles and were, in general, located in the southern end of the borrow areas. Stations in the blue cluster group were located approximately in the middle of the two borrow areas and, in general, had a predominantly medium sized sand grain habitat. It is important that for recovery to a similar benthic community, the bottom sediments should be composed of the same type of sediment as the pre-dredge bottom. From the limited (5 sampling stations) resampled in Borrow Area K, it appears that similar benthic composition and associated grain size distribution still remains in the borrow area following two dredging cycles (see Figure 7).

The benthic investigations did not find any rare or unique benthic assemblages within the vicinity of the sand borrow area. However, shifts in benthic community composition can be expected if the physical habitat is significantly different than the pre-dredging habitat. Since the majority of offshore borrow areas are in a less dynamic area (as opposed to the high-energy ebb shoal or inlet area), little replenishment of new sand into these areas is expected after dredging ceases. Therefore, the recruitment of benthic species similar to the existing community requires the exposure of a similar substrate after dredging operations terminate. Vibracore data from the borrow area was used to calculate appropriate dredging depths that will ensure that similar sand strata will remain exposed following dredging. Although the bathymetry of the borrow area will be modified as compared to the surrounding areas, the dredging will be performed in a manner that would not produce any deep pits.

All of the dominant benthic species inhabiting the proposed expansion area are small, fast growing species with opportunistic life histories that would allow them to rapidly recruit after a dredging disturbance. Additionally, the benthic community inhabiting the borrow area is not unique and is similar to other communities found in and along the New Jersey coast (Versar, 2012). The use of the expansion of Borrow Area K is not expected to have any significant new impacts on benthic resources not previously discussed in USACE (2008) for Borrow Area K. Dredging in Borrow Area K and the expansion of Borrow Area K is expected to occur on a two-year cycle for Cape May City and a four-year cycle for The Meadows so that any one area would not be dredged more frequently than once every two years. Due to the small quantity of sand generally required for the Cape May projects it is anticipated that only a portion of the borrow area(s) would be dredged for any one nourishment cycle. A few months of recovery time between dredging events in any one area should provide sufficient time for recolonization by benthic invertebrates, due to their short life cycles, high reproductive potential and recruitment of planktonic larvae from nearby areas (Naqvi and Pullen 1982). In addition, nourishment cycles for these projects usually take place during the winter months when the abundance of benthic organisms is lower, reducing impacts to the species. Recolonization usually occurs by an opportunistic species from the surrounding area, providing the sediment is similar (Boyd et al. 2005).

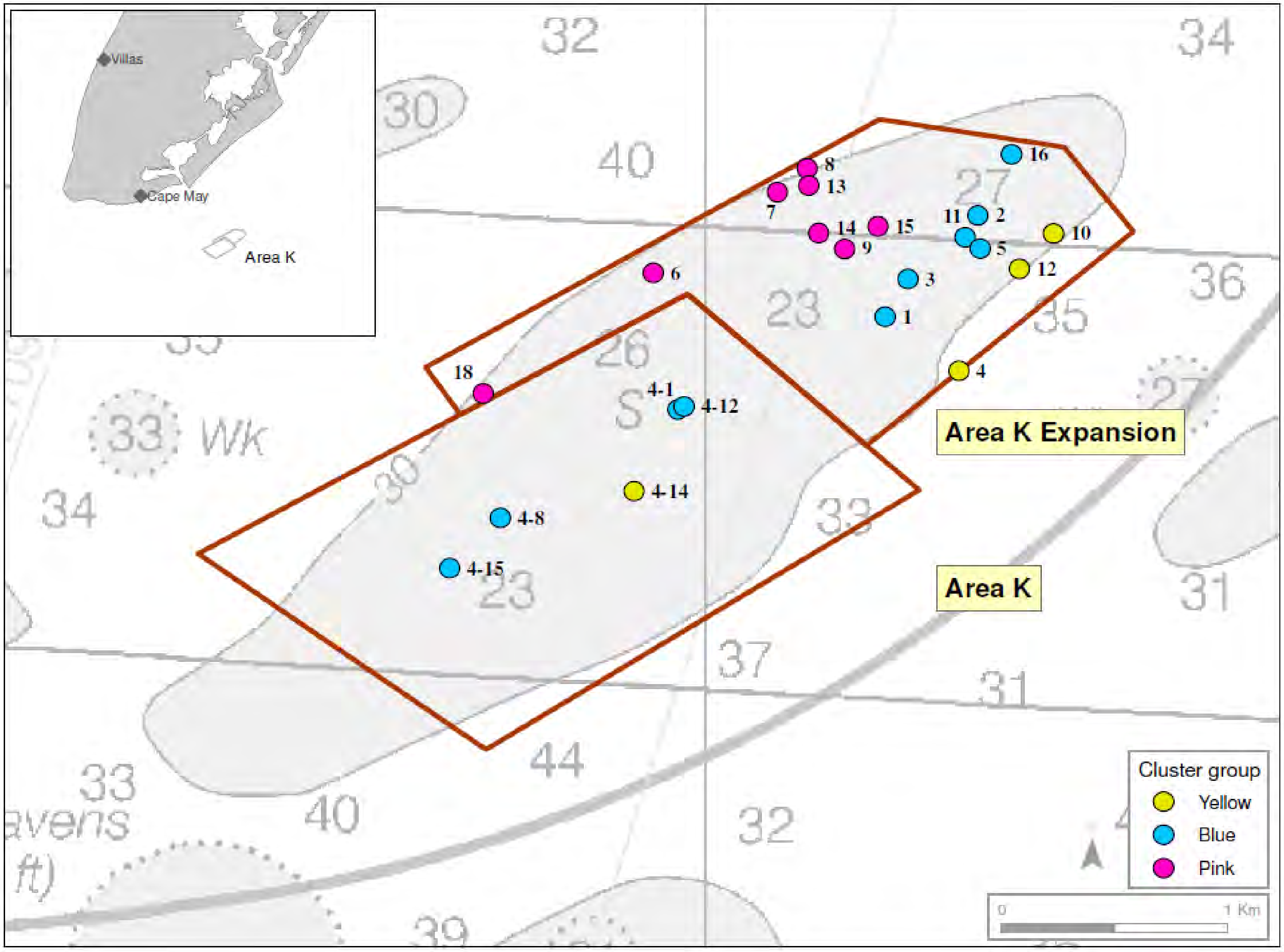

Figure 7 - Spatial distribution of station groupings based on cluster analysis of data collected from Expansion Area K and the revisit sites in Area K near Cape May in June 2011

5.4 Fisheries

5.4.1 Shellfish

As discussed most recently in USACE (2008), 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. While currently, New Jersey surf clams show evidence of recruitment failure (New Jersey Bureau of Shellfisheries 2010), it is important to maintain viable habitat for species recovery. Annual commercial surfclam surveys conducted by the New Jersey Department of Environmental Protection, Division of Fish and Wildlife indicate that the vast majority of commercial surfclam beds in New Jersey waters are located between Atlantic City and Shrewsbury Rocks, which is north of the project area.

Dredging sand for beach replenishment has the potential to impact these resources. An immediate potential 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). Evidence from a dredged area at Great Egg Harbor Inlet near Ocean City, New Jersey, indicates that surfclam populations are resilient and will be able to successfully recruit even after multiple dredging operations (Scott and Kelley 1998). Data from that study indicated that good clam recruitment was occurring and the clams in the area were reaching mature and harvestable sizes.

A review of the Mid-Atlantic Ocean Data Portal shows low to medium-low densities of Surfclam/Ocean Quahog in and around Borrow Area K and the expansion of Borrow Area K from 2012-1014. Juvenile surfclams were collected by Versar, Inc (2012) during the benthic surveys conducted in the expansion of Borrow Area K, but in very small numbers. Similar densities were identified in the 5 sampling stations from the original Borrow Area K that were resampled during this effort following 2 dredging events (Figure 8). The results of the grab samples suggest that currently, conditions favorable for clam recruitment in the area are poor. For this reason, it is unlikely that the use of the expanded borrow area would lead to a significant disruption of surf clam recruitment or survival. The substrate in the borrow area will remain a sandy substrate and the bottom depths will remain within a depth range common for adult and juvenile surf clams (NOAA 1999). As such, the expansion of Borrow Area K is not expected to have any significant impact on the surf clam population or the commercial fishery along the New Jersey Coast.

5.4.2 Prime Fishing Areas/Fisheries Resources

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. 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 impact to fish eggs and larvae are expected because these life stages are widespread throughout the Middle Atlantic Bight, and not particularly concentrated in the borrow site (Grosslein and Azarovitz, 1982).

Several Prime Fishing Areas (as identified in NJAC 7:7E-3.4) are located within the vicinity of the Cape May Projects, including an NJDEP designated Specific Sport Ocean Fishing Ground that is immediately adjacent to Borrow Area K and the expansion area (see Figure 2). As can be seen in Figure 2, the original borrow area and the expansion area have been configured to avoid impacting this area. Dredging will be conducted in a manner that will not create deep anoxic pits within the borrow area which could negatively impact surrounding fish populations. The topography of the proposed borrow area expansion is similar to that of the Ocean Fishing Grounds. Excavation in the borrow area will not exceed a depth of -40 feet NAVD 88 over the life of the borrow area and care will be taken to ensure that a sandy substrate remains following dredging activities. Potential impacts to the Specific Sport Ocean Fishing Ground will be similar to those outlined for essential fish habitat in the following section.

The primary impact to fisheries will be felt from the disturbance of benthic and epibenthic communities. The loss of benthos and epibenthos entrained or smothered during the project will temporarily disrupt the food chain in the impact area. This effect is expected to be temporary as these areas become rapidly recolonized by pioneering benthic and epibenthic species. Borrow Area K and the expansion of Borrow Area K do not contain any mapped prime fishing areas and therefore, the expansion of the borrow area will not create any additional impacts to this resource.

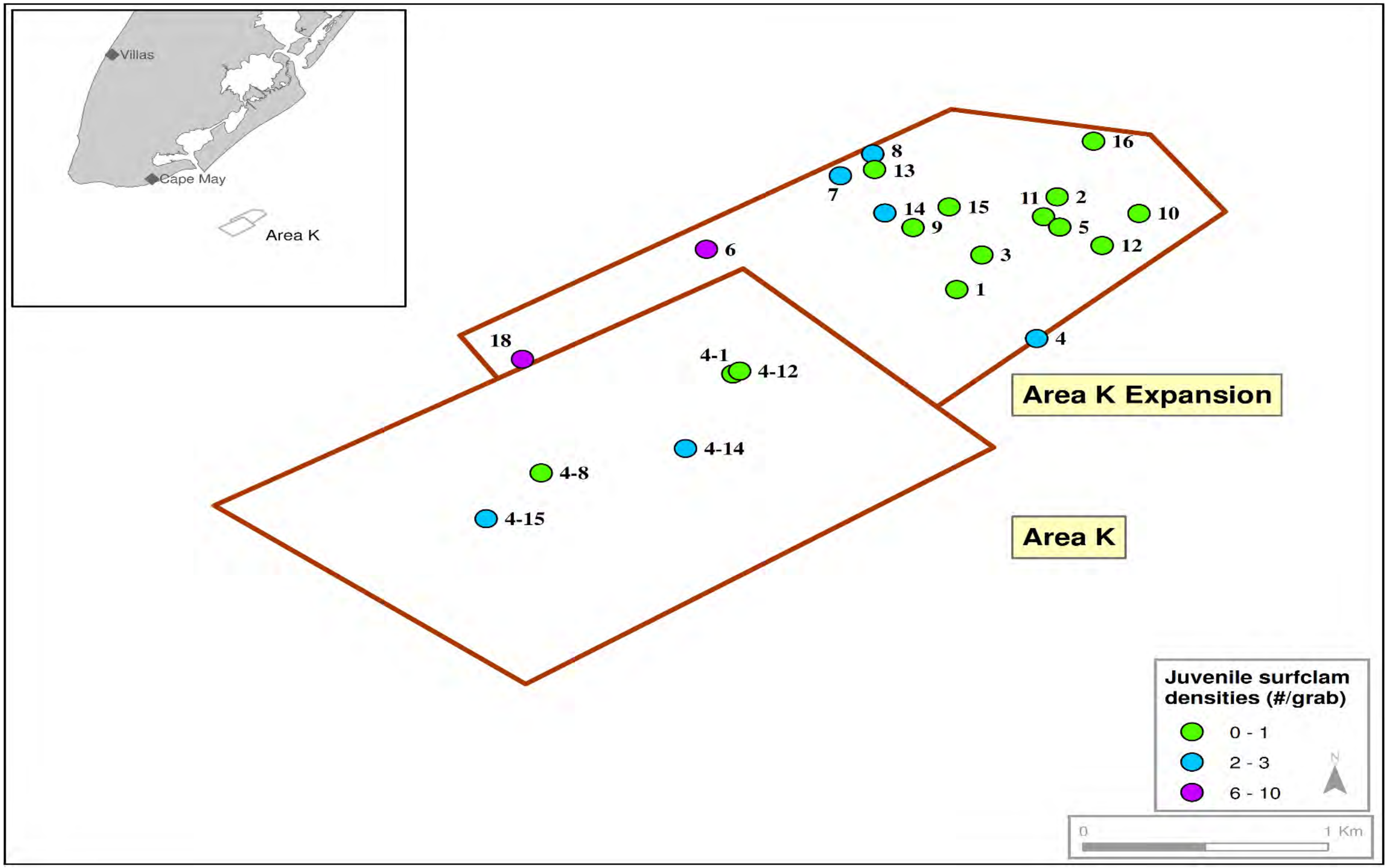

Figure 8 - Spatial distribution of juvenile surfclam densities observed in benthic samples taken at Expansion Area K near Cape May in June 2011

5.4.3 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 site 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, 1999).

Prominent shoal habitats that were identified as Prime Fishing Habitat were avoided when delineating the location of the Borrow Area K expansion. This was accomplished by avoiding sites with protected shoal habitat such as the “Eph Shoal” and “Prissy Wicks Shoal”, which are considered important sport and commercial fishing grounds in the Cape May region (Long and Figley, 1984). Other physical alterations to EFH involve substrate modifications. An example would be the conversion of a soft sandy bottom into a rocky or 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. Based on the vibracore data in the expansion of Borrow Area K, dredging depths have been established that would 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 4 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 expansion of Borrow Area K and the project impact area.

Of the 30 species identified with Fishery Management Plans, the proposed project could have immediate direct impacts on habitat for surf clams and some 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 area 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 4 - DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)

TABLE 4. DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
1. White hake (*Urophycis tenuis*)	Eggs occur in surface waters; therefore, no direct or indirect effects are expected.			
2. 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.	
3. Silver hake/whiting (*Merluccius bilinearis)*	Eggs are pelagic and are concentrated in depths of 50-150 meters, 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.	
4. Atlantic butterfish *(Peprilus tricanthus)*			**Direct:** Juvenile butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Adult butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.
6. 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. Shoreline placement area bottom habitats will be temporarily impacted and displaced seaward. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Shoreline placement area bottom habitats will be temporarily impacted and displaced seaward. **Indirect:** Temporary disruption of benthic food prey organisms.
7. Atlantic sea herring *(Clupea harengus)*			**Direct:** Occur in pelagic and near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge	**Direct:** Occur in pelagic and near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Shoreline placement area

TABLE 4. DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. Shoreline placement area bottom habitats will be temporarily impacted and displaced seaward. **Indirect:** None, prey items are planktonic	bottom habitats will be temporarily impacted and displaced seaward. **Indirect:** None, prey items are primarily planktonic
8. 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.		
9. 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.
10. Long finned squid *(Loligo pealei)*	Eggs are pelagic. No effects are anticipated.		**Direct**: Squid tend to be demersal during the day and pelagic at night. There is a potential for entrainment in the dredge.	**Direct**: Squid tend to be demersal during the day and pelagic at night. There is a potential for entrainment in the dredge.
11. Short finned squid *(Illex ilecebrosus)*	Eggs are pelagic. No effects are anticipated.	Pre-recruits are pelagic. No effects are anticipated.		
12. Surf clam *(Spisula solidissima)*			**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.	**Direct:** Complete removal within borrow site during dredging. Similar substrate would allow for recruitment. **Indirect:** Temporary reduction in reproductive potential.
13. 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.
14. Scup *(Stenotomus chrysops)*			**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults should be capable of relocating during impact.

TABLE 4. DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	**Indirect:** Temporary disruption of benthic food prey organisms.
15. Black sea bass *(Centropristus striata)*			**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. Some 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. Some 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.
16. Skipjack tuna (*Katsuwonus pelamis*)				**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.
17. Spiny dogfish *(Squalus acanthias)*			**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.	**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.
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	**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.

TABLE 4. DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			benthic community, however, mackerel are highly 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*)		**Neonates Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. However, some mortality of neonates could be expected from entrainment into the dredge because they may be oriented with the bottom. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow sites 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.	**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. Adults are mobile and would be able to avoid dredge. **Indirect:** Temporary disruption of benthic food prey organisms.
22. Atlantic angel shark (*Squatina dumerilli*)		**Neonates Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. However, some mortality of neonates could be expected from entrainment into the dredge because they may be oriented with the bottom. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge because they may be oriented with the bottom. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. Adults are mobile and would be able to avoid dredge. **Indirect:** Temporary disruption of benthic food prey organisms.

TABLE 4. DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
23. Common thresher shark (Alopias vulpinus)		**Neonates Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Mortality from dredge unlikely because embryos generally range between 3 and 5 feet in length. Therefore, the newborn may be mobile enough to avoid a dredge or placement areas. **Indirect:** Temporary disruption of benthic food prey organisms.	**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.	**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.
24. Dusky shark *(Charcharinus obscurus)*		**Neonates 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.		
25. Sandbar shark *(Charcharinus plumbeus)*		**Neonates Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of neonates 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.	**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.

TABLE 4. DIRECT AND INDIRECT IMPACTS ON FEDERALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT (EFH) IN THE PROJECT AREA (NOAA, 2018)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
		Indirect: Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		
26. Tiger shark *(Galeocerdo cuvieri)*			**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Mortality from dredge or fill placement unlikely because juveniles are 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.	**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. Smoothhound shark (*Mustelus mustelus)*		**Neonates Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of neonates may be possible from entrainment into the dredge or burial in nearshore, but not likely since newborns are approx. 1.3 ft. in length and are considered to be mobile. **Indirect:** Temporary disruption of benthic food prey organisms.	**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.	**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.
28. Little skate (*Raja erinacea*)			**Direct:** Juvenile skates are pelagic. No significant direct effects anticipated. **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 dredging. . **Indirect:** Temporary disruption of benthic food prey organisms.
29. Winter skate (*Raja ocellata*)			**Direct:** Juvenile skates are pelagic. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	
30. Clearnose skate (*Raja eglanteria*)			**Direct:** Juvenile skates are pelagic. No significant direct effects anticipated. **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 dredging. . **Indirect:** Temporary disruption of benthic food prey organisms.

5.5 Threatened and Endangered Species

USACE (2008) most recently identified potential project impacts on beach birds such as the piping plover and red knot, which are Federally listed as threatened and State listed as endangered, the Federally-listed threatened plant, seabeach amaranth, and the least tern and black skimmer (both State endangered species). To address the potential impacts to these species, the Philadelphia District developed a programmatic Biological Assessment (BA) for the piping plover and seabeach amaranth as part of formal consultation requirements with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act. The USFWS reviewed the BA and subsequently issued a Biological Opinion in December 2005. The requirements outlined in the Biological Opinion have been adopted in order to comply with this statute. The Terms and Conditions outlined in the BO include actions such as monitoring during construction, imposing timing restrictions if nests are found, installation of temporary protective fencing, and avoidance during construction. In general, past nourishment activities have taken place outside of the plover nesting season due to the quantity of fill required. The BO includes a requirement for community developed plover management plans to address local practices such as beach raking, off-road vehicles, 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 periodic maintenance may involve avoidance of the area (if possible), collection of seeds to be planted in non-impacted areas, and timing restrictions.

Beach replenishment can potentially have significant direct and indirect adverse impacts on these species. Sand placement can bury plover nests, and machinery on the beach can crush eggs, nestlings, and adults. Other construction activities such as pipeline placement, surveys, and noise also have the potential to impact the nesting behavior of piping plovers, as well as the presence of wintering red knots in the project area. Sand placement activities have the potential to bury seabeach amaranth plants during the growing season. Piping plovers have historically nested within the project areas, but the last nest in Lower Cape May Meadows was in 2014 and the last nest in Cape May City was in 2013. Overall, NJDEP, Division of Fish and Wildlife, has reported a concerning drop in plover nesting in all of Cape May County over the last few years. If piping plovers again become established within the project area during construction activities, 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) will be required. No seabeach amaranth plants have been found in the project areas since 2004 when 6 plants were found at the Coast Guard Station. All work for both of these projects will adhere to the Terms and Conditions outlined in the 2005 Biological Opinion (BO) from the USFWS. As required in the BO, formal Tier 2 coordination will continue to take place prior to each nourishment cycle on both projects to update and coordinate project details. The expansion of Borrow Area K will have no additional impacts to piping plovers or seabeach amaranth that was not previously discussed in USACE (1980, 1998, 2002 and 2008).

The red knot may be present at the site during the spring and fall migration, with some birds still being present in the early winter time period. As is the case with plovers, the projects have the potential to temporarily impact food resources within the placement area. Since portions of the projects will not be impacted during nourishment cycles, sufficient food should still be readily available within the project areas. In addition, due to the timing of the construction, it is not anticipated that any birds will be present during construction activities. If any birds are present, they will easily be able to move away from the construction activities to another portion of the beach where they will not be disturbed. Informal consultation with regard to the red knot will be completed during the Tier 2 coordination.

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. In addition to sea turtles and whales, the Federally endangered New York Bight Distinct Population Segment (DPS) of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*, may 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, 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, and the transient nature of the species in the marine environment, this temporary movement away from the borrow areas does not constitute a significant effect on this species.

Formal consultation with the National Marine Fisheries Service (NMFS) in accordance with Section 7 of the Endangered Species Act was completed in 2014 with the preparation of a Biological Opinion from NMFS for beach nourishment projects within the Philadelphia District, including the Cape May City and The Meadows projects. The utilization of the expansion of Borrow Area K does not change the potential project impacts outlined in the BO. Both projects will continue to adhere to the Terms and Conditions outlined in the 2014 BO from NMFS.

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 endangered species monitors would be able to observe any impacts to turtles or sturgeon during the dredging activities. For this reason, as reflected in the BO, NMFS no longer requires the presence of monitors on hopper dredges where munitions screens are required. Monitoring now takes place on the beach during the inspection of the munitions baskets. No sea turtles or sturgeon have been taken during a beach nourishment project within the District. The expansion of Borrow Area K will have no additional impacts to sea turtles, whales or Atlantic sturgeon that were not previously accounted for in the Biological Opinion.

5.6 Noise Quality

Minor short-term impacts to noise levels would result from construction phases of beach nourishment utilizing the Borrow Area K expansion area. Noise impacts would be restricted to site construction preparation (generally beginning two weeks prior to dredging) and the actual dredging and placement operation. Noise is limited to the utilization of heavy equipment such as dredges and bulldozers to manipulate the material during placement. Depending on circumstances, construction may be conducted overnight to meet construction schedules. Dredging activities and grading equipment use would produce noise levels in the 70 to 90 dBA (50 feet from the source) range, but these would be restricted to the beach area and offshore at the dredge site. These noises would be masked by the high background levels of the surf or dissipated by distance. Conducting the work in the off-season would further minimize the impact. No long-term significant impacts to noise levels in the vicinity of the projects are anticipated.

5.7 Cultural Resources

As a result of our review of the information provided in the cultural resources investigations referenced above, the District has found that implementation of the selected plan, as detailed in this EA, will have no adverse effect on significant historic resources. No additional underwater archaeological investigations are recommended in expansion of Borrow Area K. The NJSHPO concurrence with this determination is being requested.

5.8 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 (1980, 1998, 2002 and 2008) 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). Nine active Federal projects are located along the coast of New Jersey that each utilize either an offshore sand source or an adjacent inlet. Non-Federal projects have been conducted recently (since 1995) by NJDEP and several municipalities in Avalon, Stone Harbor, Sea Isle City, Strathmere, Southern Ocean City, and Brigantine. Currently, approximately 71% of the NJ Coastline either have an existing Federal project or are under study for a Federal project. These evaluations 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 approximately 9,600 acres of marine subtidal habitat would be affected over a period of 50 years for USACE designated borrow areas. The expansion of Borrow Area K will result in approximately 312 more acres of marine habitat affected by dredging over the long-term, but does not add significant acreage to the total borrow areas designated within Philadelphia District. As discussed most recently in USACE (2008), 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, funding was provided to complete authorized, but unconstructed projects, which included the Great Egg Harbor Inlet to Townsends Inlet and the Manasquan Inlet to Barnegat Inlet projects.

Previous USACE documents 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. Previous USACE documents 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. Given the short-term effects of the sand replenishment on the beaches, this is not a significant cumulative impact.

The cumulative impacts on Essential Fish Habitat (EFH) are not considered significant. Like the benthic environment, the impacts to EFH are temporary in nature and do not result in a permanent loss in EFH. The borrow site expansion proposed for these projects does not contain wrecks and reefs, or any known hard bottom features that could be permanently lost due to the impacts from dredging. These types of habitat were avoided through careful site selection and coordination with fishery resource agencies. Some minor and temporary impacts would result in a loss of food source in the affected areas. Cumulative losses of EFH for surf clams can be avoided by not dredging deep holes, and leaving similar sandy substrate (w/ 3 feet of sand or more) for recruitment.

In addition to the potential impacts to benthic and fisheries resources discussed, the proposed Federal projects also have the potential of cumulative impacts to the Federally listed piping plover, red knot and seabeach amaranth. Due to the amount of uncertainty that exists regarding when and how any of the proposed projects will be built, and the uncertainty of the number and location of plover nests in any given year, it is extremely difficult to quantify the potential impacts to piping plovers for any, and all of the proposed projects. If the majority of the ongoing and proposed construction activities are accomplished outside of the nesting season, the overall impacts to plovers will be minimal, and the birds most likely will benefit from the additional beach areas. Through the implementation of plover management plans and the monitoring program, impacts related to human activities on the new beaches will be greatly reduced and in some cases eliminated. The results of the Ocean City nearshore benthic sampling which was conducted in 2001 indicated that while the abundance of major taxa within the benthic community of the lower intertidal zone was reduced 4 months after sand placement, 6 months after placement, the community appeared to be recovering to pre-placement conditions. Impacts within the upper intertidal area, where plovers directly feed, were not detected in either the 4 or 6 month sampling periods. Based on this data, it is possible that plover habitat may be negatively impacted on a temporary basis during the nesting season immediately following construction due to diminished food resources. This impact is more likely during the initial construction of a project due to the quantity of fill and duration of the activities. Currently the only two projects where initial construction is not complete are the Barnegat Inlet to Little Egg Harbor Inlet (Long Beach Island) and Manasquan Inlet to Barnegat Inlet projects which are currently being constructed. The Hereford Inlet to Cape May Inlet project which is still in the planning phases, will use sand backpassing to place sand on the beaches of North Wildwood. The timing of the fill will also play a role in the rate of benthic recovery. Following initial fill, nourishment activities will take place only in areas with a high rate of erosion. Areas which have not eroded past the design template will not be filled. For this reason, it is even less likely that nourishment activities will affect areas with nesting plovers since it is unlikely that the birds will be nesting in areas with more narrow beaches and greater erosion. This has been the case in Ocean City where fill has not been placed south of 14^{th} street for several cycles since this area is fairly stable.

In addition, due to the short duration of nourishment activities, and the limited quantity of sand associated with most cycles, it is anticipated that most, if not all, of these activities will take place outside of the plover nesting season. The possibility does still exist however that the fill activities may result in a reduction of prey resources available to plovers during the next nesting season. Due to the fact that, on average, only two or three of the existing or proposed locations will be impacted during any given year, these activities should not cause the species any undo risk or greatly impact the species as a whole. Since newly placed sand will most likely create additional habitat for the plovers and seabeach amaranth that does not currently exist, it is expected that even with these activities, more undisturbed habitat will be available to the species than currently exists. It should be noted that large portions of the New Jersey coast will still be available for use as nesting habitat on any given year.

Similar uncertainty exists when trying to quantify the potential impacts to seabeach amaranth since the species has a very patchy distribution within southern New Jersey. The protection measures being developed with USFWS, however, should ensure that impacts are avoided or minimized to the greatest extent possible and therefore construction activities should not jeopardize the species and may actually create suitable habitat for the species.

6 COMPLIANCE WITH ENVIRONMENTAL STATUTES

Compliance with applicable Federal Statutes, Executive Orders, and Executive Memoranda was most recently discussed in USACE (2008). Table 5 is a complete listing of compliance status relative to environmental quality protection statutes and other environmental review requirements.

A Section 404(b)(1) evaluation in compliance with Section 404 of the Clean Water Act was also prepared in the previous EAs/EISs. An updated 404(b)(1) analysis pertaining to the alternative sand sources is provided in Appendix A of this document. A Section 401 Water Quality Certification will be obtained from NJDEP for the use of the expanded borrow area.

The proposed dredging and maintenance activities comply with, and will be conducted in a manner consistent with New Jersey's requirements with regard to the Coastal Zone Management Act. While coordination with regard to the Coastal Zone Management Act has previously been conducted for both projects, a modification to the existing Federal Consistency Determination was requested from NJDEP to address the borrow area expansion discussed in this EA.

The use of the sand borrow source described in this document is not expected to have significant changes in air quality impacts. A Clean Air Act Record of Non-Applicability (RONA) that demonstrates a typical emissions output projected over two calendar years is presented in Appendix B of this document that demonstrate that compliance can be met with Section 176(c)(1) of the Clean Air Act amendments of 1990 utilizing the expansion of Borrow Area K.

7 CONCLUSIONS

This EA evaluates the impacts of the use of an expansion of an existing sand borrow area to support the berm and dune restoration plans presented in the 1980 Final Supplemental EIS (USACE 1980) for storm damage reduction in Cape May City and in the 1998 Final EIS (USACE 1998) for environmental restoration activities at Lower Cape May Meadows – Cape May Point.

Evaluations of impacts on resources addressed previously in USACE (1980, 1998, 2002, and 2008) were not discussed in this EA and were incorporated by reference. The evaluations presented in this EA address the expansion of Borrow Area K, as well as any other changes in the proposed project, and regulatory changes that have occurred since 2008. These 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 action. Since the potential impacts 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.

Table 5 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	Ongoing
Clean Air Act, as amended	Full
Clean Water Act of 1977	Full
Coastal Barrier Resources Act	N/A
Coastal Zone Management Act of 1972, as amended	Ongoing
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	Ongoing
Land and Water Conservation Fund Act, as amended	N/A
Marine Protection, Research and Sanctuaries Act	Full
Magnuson-Stevens Fishery Conservation and Management Act	Ongoing
National Historic Preservation Act of 1966, as amended	Full
National Environmental Policy Act, as amended	Ongoing
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.

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APPENDIX A

404(b)(1) Evaluation

APPENDIX B

CLEAN WATER ACT SECTION 404 (b)(1) EVALUATION
U.S. ARMY CORPS OF ENGINEERS

PROJECT: EXPANSION OF OFFSHORE BORROW AREA K FOR THE CAPE MAY INLET TO LOWER TOWNSHIP STORM DAMAGE REDUCTION PROJECT AND THE LOWER CAPE MAY MEADOWS – CAPE MAY POINT ENVIRONMENTAL RESTORATION PROJECT, CAPE MAY COUNTY, NEW JERSEY

PROJECT DESCRIPTION: The purpose of this projects is to provide storm damage reduction and environmental restoration for the areas surrounding the projects in Cape May City and the Lower Cape May Meadows, located in Cape May County, NJ. The current proposed action will add an additional 312 acres of offshore sandy habitat to be used as a borrow source for the future nourishment cycles for the above referenced projects.

1. Review of Compliance (Section 230.10(a)-(d)).

	YES	NO
a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose.	| X_|	| _ |
b. The activity does not appear to: 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally listed threatened and endangered species or their critical habitat; and 3) violate requirements of any Federally designated marine sanctuary	| X_ |	| _ |
c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values	| X_ |	| _ |
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem	| X_ |	| _ |

2. Technical Evaluation Factors (Subparts C-F).

	N/A	Not Significant	Significant
a. Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C) (Sec. 230.20-230.25).			
1) Substrate.		X	
2) Suspended particulates/turbidity.		X	
3) Water.		X	
4) Current patterns and water circulation.		X	
5) Normal water fluctuations.		X	
6) Salinity gradients.	X		
b. Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)(Sec. 230.30-230.32).			
1) Threatened and endangered species.		X	
2) Fish, crustaceans, mollusks and other aquatic organisms in the food web.		X	
3) Other wildlife.		X	
c. Potential Impacts on Special Aquatic Sites (Subpart E)(Sec. 230.40-230.45).			
1) Sanctuaries and refuges.	X		
2) Wetlands.	X		
3) Mud flats.	X		
4) Vegetated shallows.	X		
5) Coral reefs.	X		
6) Riffle and pool complexes.	X		
d. Potential Effects on Human Use Characteristics (Subpart F)(Sec 230.50-230.45)			
1) Municipal and private water supplies.	X		
2) Recreational and commercial fisheries.		X	
3) Water-related recreation.		X	
4) Aesthetics.		X	
5) Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves.		X	

3. <u>Evaluation and Testing (Subpart G)</u> (Sec. 230.60-230.61)

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

1) Physical characteristics.........................	X
2) Hydro-geography in relation to known or anticipated sources of contaminants..............	
3) Results from previous testing of the material or similar material in the vicinity of the project ..	
4) Known, significant sources of persistent pesticides from land runoff or percolation	
5) Spill records for petroleum products or designated hazardous substances (Section 311 of CWA)	
6) Public records of significant introduction of contaminants from industries, municipalities, or other sources	X

7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities .... | |
8) Other sources (specify) .... | |

List appropriate references:

Draft Environmental Assessment for the Expansion of Offshore Borrow Area K for the Cape May Inlet to Lower Township Storm Damage Reduction Project and the Lower Cape May Meadows – Cape May Point Environmental Restoration Project

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to require constraints. The material meets the testing exclusion criteria.

|X| YES | | NO

4. <u>Disposal Site Delineation (Section 230.11(f))</u>.

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

1) Depth of water at disposal site .... | |
2) Current velocity, direction, and variability at the disposal site .... | |
3) Degree of turbulence .... | |
4) Water column stratification .... | |
5) Discharge vessel speed and direction .... | |
6) Rate of discharge .... | |
7) Dredged material characteristics (constituents, amount, and type of material, settling velocities) .... |X |
8) Number of discharges per unit of time .... | |
9) Other factors affecting rates and patterns of mixing (specify) .... | |

List appropriate references:

Draft Environmental Assessment for the Expansion of Offshore Borrow Area K for the Cape May Inlet to Lower Township Storm Damage Reduction Project and the Lower Cape May Meadows – Cape May Point Environmental Restoration Project

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable

| X | YES | | NO

5. <u>Actions To Minimize Adverse Effects (Subpart H)(Sec. 230.70-230.77)</u>.

All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

|X| YES NO

List actions taken:

a. Use of a flat offshore area to minimize potential impacts to marine fisheries resources.
b. Use of an area with grain size more closely compatible with placement area.
c. Use of an area with benthic population that is characteristic of NJ Coast and will recover quickly following dredging activities.

6. Factual Determination (Section 230.11).

A review of appropriate information as identified in items 2 - 5 above indicates that there is minimal potential for short or long term environmental effects of the proposed discharge as related to:

a.	Physical substrate (review sections 2a, 3, 4, and 5 above).	YES | | NO |X| |
b.	Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5).	YES |X | NO | | |
c.	Suspended particulates/turbidity (review sections 2a, 3, 4, and 5).	YES | | NO |X| |
d.	Contaminant availability (review sections 2a, 3, and 4).	YES |X | NO | | |
e.	Aquatic ecosystem structure, function and organisms(review sections 2b and c, 3, and 5)	YES | | NO |X | |
f.	Proposed disposal site (review sections 2, 4, and 5).	YES | | NO |X | |
g.	Cumulative effects on the aquatic ecosystem.	YES |X | NO | | |
h.	Secondary effects on the aquatic ecosystem.	YES |X | NO | | |

7. Findings of Compliance or non-compliance. (Sec. 230.12)

The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines. YES |X | NO | |

APPENDIX B

Clean Air Act
RECORD OF NON-APPLICABILITY (RONA)

APPENDIX B

RECORD OF NON-APPLICABILITY (RONA)

Project Name: Cape May Inlet to Lower Township (Cape May City) Hurricane and Shore Protection Project

Reference: USAGE Flood Control and Coastal Emergencies (FCCE) Project Information Report (PIR) and PIR Addendum.

Project Action Point of Contact: Steven Allen, CENAP-PL-E Begin

Date: September 2016

End Date: April 2017

1. Project Description: Under the authority of 33 USC 701n (Public Law (PL) 84-99) the Federal Government has the mission to provide timely, effective, and efficient disaster preparedness, response, recovery, and mitigation projects and services on a nationwide basis to reduce loss of life and property damage under DOD, USAGE, FEMA, and other agencies' authorities. In order to qualify for assistance under PL 84-99, a Project Information Report (PIR) is prepared to document damage to the project, estimate costs and benefits of the proposed rehabilitation effort, and document National Environmental Policy Act, Fish and Wildlife Coordination Act, Endangered Species Act, and coastal zone management coordination. This documentation was prepared in response to the nor'easter that occurred from 22 – 25 January 2016. This storm caused significant damage to the Cape May Inlet to Lower Township (Cape May City) Coastal Storm Risk Management Project, due to beach erosion of the Cape May City component of the project. In response to this storm, a PIR was prepared to document these damages and to recommend various project "repair" and "restore" scenarios. All of the scenarios recommend beachfill acquired by hydraulic dredging from an approved sand borrow area.

2. An emissions estimate was completed to determine the Nitrogen Oxides (NOx) and Volatile Organic Carbon (VOC) emissions (precursors to ozone formation) associated with the largest sand quantity presented in the June 2016 Cape May Inlet to Lower Township (Cape May City) Hurricane and Shore Protection Project PIR. This sand quantity is estimated at 787,000 cy, associated with Scenario 3, the full "repair and restore" option. This scenario is presented consistent with USAGE Implementation Guidance dated 4 April 2016, specific to implementing "repair and restore" identified in WRRDA 2014 Section 3029. Repair of the losses caused by the January 2016 nor'easter, plus restoration to the full authorized project template using a hydraulic dredge to obtain sand from the permitted offshore borrow area, will require 787,000 cy of sand. Dredging this quantity of sand is calculated to generate a total of 109.6 tons of NOX and 3.7 tons of VOCs that would be split over two calendar years.

3. The project described above has been evaluated for Section 176 of the Clean Air Act. Project related emissions associated with the federal action were estimated to evaluate the applicability of General Conformity regulations (40CFR§93 Subpart B).

4. The project is located in Cape May County, New Jersey, which has the following nonattainment-related designations with respect to the National Ambient Air Quality Standards (40CFR§81.133): Marginal Nonattainment 2008 8-hour Ozone Standard (primary and secondary).

5. The requirements of this rule do not apply because the total direct and indirect emissions from this project are less than the 100 tons trigger level for NOx for each project year and significantly below the 50 tons trigger level for VOC (40CFR§93.153(b)(1) & (2)), as VOCs, are typically a fraction of total NOx emissions. The estimated emissions for the project for each pollutant are provided below.

CALENDAR YEAR	MONTHS	TONS NOx	TONS VOC
2016	4	54.8	1.85
2017	4	54.8	1.85
TOTAL	8	**109.6**	3.7

6. The project conforms with the General Conformity requirements (40CFR§93.153(c)(1)) and is exempted from the requirements of 40 CFR §93 Subpart B.

Peter R. Blum P.E.
Chief, Planning Division

APPENDIX B

Cape May Inlet to Lower Township (Cape May City)
Borrow Area: Area "K"
787,000 cubic yards
4,818 linear feet of shoreline

Equipment	# of Engines	HP	Load Factor (LF)	Days of Operation	Hrs/Day	Total Hours	hp-hr	Nox Emission Factor (g/hp-hr)	Nox Emissions (tons)	VOC Emission Factor (g/hp-hr)	VOC Emissions (tons)
Pipeline Dredging Equipment List (Assumes Tier 2 Engines)											
Mob/Demob											
PIPELINE DREDGE, PRIME ENGINE	0	9000	0.66	0	0	0	0	4.90	0	0.070	0
PIPELINE DREDGE, ELECTRIC GENERATOR	1	830	0.40	15.60	24	374.40	124301	4.90	0.67	0.197	0.027
PIPELINE DREDGE, DREDGE PUMP	0	3310	0.80	0	0	0	0	4.90	0	0.197	0
WORK TUG, PRIMARY	1	4000	0.69	15.60	24	374.40	1033344	5.60	6.38	0.197	0.224
WORK TUG, SECONDARY Electric	1	50	0.40	15.60	24	374.40	7488	5.60	0.05	0.556	0.005
SURVEY BOAT, SHORE	1	210	0.50	15.60	24	374.40	39312	5.60	0.24	0.197	0.009
SURVEY BOAT, SHORE, SECONDARY Electric	1	40	0.40	15.60	24	374.40	5990	5.60	0.04	0.556	0.004
DERRICK, PRIMARY	1	200	0.40	15.60	24	374.40	29952	5.60	0.18	0.197	0.007
DERRICK, SECONDARY Electric	1	40	0.20	15.60	24	374.40	2995	5.60	0.02	0.556	0.002
TENDER TUG, PROPULSION	1	4000	0.69	15.60	24	374.40	1033344	5.60	6.38	0.197	0.224
TENDER TUG, SECONDARY	1	50	0.40	15.60	24	374.40	7488	5.60	0.05	0.556	0.005
SURVEY BOAT, OFFSHORE	1	500	0.50	15.60	24	374.40	93600	5.60	0.58	0.197	0.020
SURVEY BOAT, OFFSHORE, SECONDARY Electric	1	40	0.40	15.60	24	374.40	5990	5.60	0.04	0.556	0.004
Beach Replenishment – Dredging											
PIPELINE DREDGE, PRIME ENGINE	1	9000	0.66	106.20	15.60	1656.72	9840917	4.90	53.15	0.070	0.759
PIPELINE DREDGE, ELECTRIC GENERATOR	1	830	0.40	106.20	15.60	1656.72	550031	4.90	2.97	0.197	0.119
PIPELINE DREDGE, DREDGE PUMP	1	3310	0.80	106.20	15.60	1656.72	4386995	4.90	23.70	0.197	0.953
WORK TUG, PRIMARY	0	4000	0.69	0	0	0	0	5.60	0	0.197	0
WORK TUG, SECONDARY Electric	0	50	0.40	0	0	0	0	5.60	0	0.556	0
SURVEY BOAT, SHORE	1	210	0.50	106.20	15.60	1656.72	173956	5.60	1.07	0.197	0.038
SURVEY BOAT, SHORE, SECONDARY Electric	1	40	0.40	106.20	15.60	1656.72	26508	5.60	0.16	0.556	0.016
DERRICK, PRIMARY	1	200	0.40	106.20	15.60	1656.72	132538	5.60	0.82	0.197	0.029
DERRICK, SECONDARY Electric	1	40	0.20	106.20	15.60	1656.72	13254	5.60	0.08	0.556	0.008
TENDER TUG, PROPULSION	1	1000	0.69	106.20	15.60	1656.72	1143137	5.60	7.06	0.197	0.248
TENDER TUG, SECONDARY	1	50	0.40	106.20	15.60	1656.72	33134	5.60	0.20	0.556	0.020
SURVEY BOAT, OFFSHORE	1	500	0.50	106.20	15.60	1656.72	414180	5.60	2.56	0.197	0.090
SURVEY BOAT, OFFSHORE, SECONDARY Electric	1	40	0.40	106.20	15.60	1656.72	26508	5.60	0.16	0.556	0.016
On-Shore Equipment List (Assumes Tier 2 Engines)											
Mob/Demob											
TRUCK TRAILER, LOWBOY, 75 TON, 3 AXLE (ADD TOWING TRUCK)	0	0	0	10.00	8	0	0	0	0	0	0
TRUCK, HIGHWAY, 55,000 LBS (24,948KG) GVW, 6X4, 3 AXLE, (ADD ACCESSORIES)	1	310	0.59	10.00	8	80.00	14632	4.90	0.08	1.300	0.021
LOADER/BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 9.8' DEPTH OF HOE, 24" DIPPER, 4X4	1	78	0.59	8.00	8	64.00	2945	4.90	0.02	1.300	0.004
TRUCK, HIGHWAY, CONVENTIONAL, 8,600 LBS (3,901KG)GVW, 4X2, 2 AXLE, 3/4 TON –PICKUP	1	135	0.59	6.90	8	55.20	4397	4.90	0.02	1.300	0.006
On-Shore Beach Replenishment											
TRUCK, HIGHWAY, 8,600 GVW, 4X4 (SUBURBAN)	1	135	0.59	39.40	15.60	614.64	48956	0	0	1.300	0.070
TRACTOR ATTACHMENTS, BLADE, UNIVERSAL, HYDRAULIC, FOR D9, 21.40 CY (ADD D9 TRACTOR)	0	0	0	37.50	15.60	0	0	4.90	0	1.300	0

TRACTOR, CRAWLER (DOZER), 410 HP, POWERSHIFT, W/17.7 CY SEMI-U BLADE (ADD ATTACHMENTS)	3	410	0.59	37.50	15.60	1755	424535	4.90	2.29	1.300	0.608
LOADER, FRONT END, WHEEL, INTEGRATED TOOL CARRIER, 1.75 CY (1.3 M3) LOADER; 6,303 LB (2,859 KG) @ 12.17' (3.7 M) HIGH, FORK LIFT, OR 1,841 LB (835 KG) @ 22.42' (6.8 M) HIGH, MATERIAL HANDLING ARM	1	90	0.59	39.40	15.60	614.64	32637	4.90	0.18	1.300	0.047
TRACTOR, CRAWLER (DOZER), 410 HP, POWERSHIFT, W/17.7 CY SEMI-U BLADE (ADD ATTACHMENTS)	1	410	0.59	5.80	15.60	90.48	21887	4.90	0.12	1.300	0.031
TRUCK, HIGHWAY, CONVENTIONAL,8,800 GVW, 4X4, 2 AXLE, 3/4 TON (PICKUP)	1	135	0.59	46.50	15.60	725.4	57778	4.90	0.31	1.300	0.083
TOTAL EMISSIONS (Tons)									109.6		3.7
CLEAN AIR ACT GENERAL CONFORMITY RULE LIMIT per CY									100		50