Draft
ENVIRONMENTAL ASSESSMENT

BENEFICIAL USE OF SAND
NEW JERSEY INTRACOASTAL WATERWAY
CAPE MAY CANAL

CAPE MAY COUNTY, NEW JERSEY

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1.0 PROJECT LOCATION, DESCRIPTION, AND AUTHORITY

The New Jersey Intracoastal Waterway (NJIWW) is a sea-level inland waterway that extends along the New Jersey coast about 117 miles from the Atlantic Ocean at Manasquan Inlet to the Cape May Canal to the Delaware Bay, about 3 miles north of Cape May Point. The project location is the Cape May Canal, the southernmost section of the NJIWW, constructed in 1942 (Figure 1-1). It is maintained to a depth of up to 12 feet mean low water (MLW). The NJIWW project was adopted in 1939 (HD 76-133, 1st session). The NJIWW provides a safe, reliable and operational inland navigation channel for commercial, recreational fishing vessels, the Cape May Lewes ferry service, and nine U.S. Coast Guard stations. The USCG requires a reliable channel to fulfill their Homeland Security requirements and conduct search and rescue operations. Other commercial users include head-boats and tour-boats that operate over various portions of the waterway. The Delaware River and Bay Authority operates a ferry service between Cape May, New Jersey and Lewes, Delaware and the ferries dock in the Cape May Canal. Almost 1.5 million passengers are dependent on maintenance dredging to keep the four vessels operating. The South Jersey economy is heavily dependent on recreational and commercial fishing and tourism, and these industries rely on the maintained channels of the NJIWW.

Figure 1-1: Cape May Canal and upland confined disposal facility (CDF) Area D.

In 1998, the U.S. Army Corps of Engineers (USACE), Philadelphia District evaluated the potential environmental impacts associated with a Coastal Storm Risk Management (CSRM) and environmental restoration activities at Lower Cape May Meadows (The

Meadows)-Cape May Point (Figure 1-2). The project was authorized for construction by Title I, Section 101 (a)(25) of WRDA 1999. The selected plan for this project included constructing a protective beach dune and berm restoration along the shoreline extending from the 3rd Avenue terminal groin in Cape May City to the Central Avenue groin in Cape May Point. Periodic nourishment occurs every four years. Initial dune and beach construction was completed in 2007 with the placement of 1,406,000 cubic yards (cy) of sand. The sand sources were obtained from offshore borrow areas.

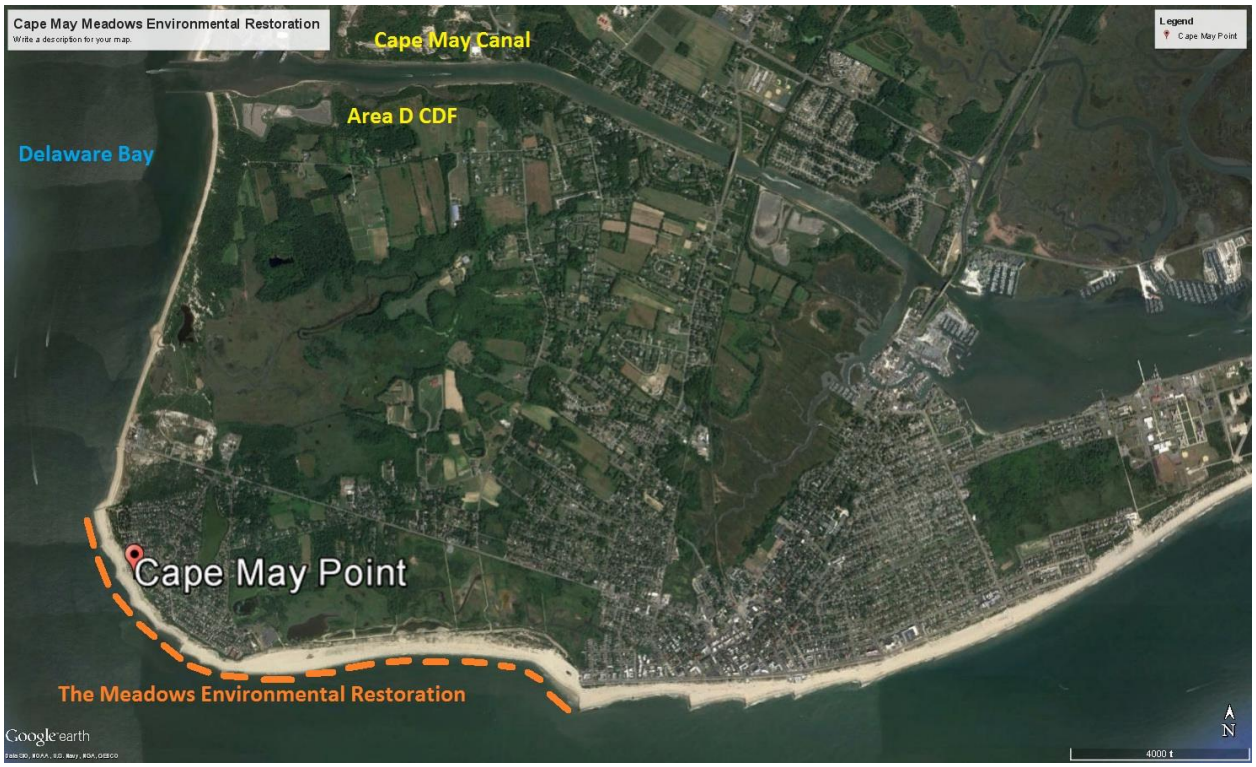


Figure 1-2: The Lower Cape May Meadows – Cape May Point (The Meadows) CSRM/Environmental Restoration site.

As part of the authorized NJIWW project, the Cape May Canal undergoes maintenance dredging operations annually. The USACE seeks to utilize Regional Sediment Management and Engineering with Nature principles to modify the past practice of placing high quality sand in a USACE confined disposal facility (CDF) where capacity is limited and the sand is removed from the natural marine sediment system. The USACE proposes to modify the maintenance dredge material placement plan for the Cape May Canal such that dredged material possessing >90% sand will be placed in the nearshore zone and within the depth of closure for The Meadows restoration project at the western end (Cape May Point). The USACE plans to conduct the first such dredging and placement operation of approximately 5,000-10,000 cubic yards (cy) of >90% sand in the fall of 2017 within the authorized Meadows beach restoration inshore project area.

The purpose of this Environmental Assessment (EA) is to address the modification to the disposal plan for annual maintenance dredging of the NJIWW Cape May Canal.

Previously, all maintenance material dredged from the Cape May Canal, irrespective of grain size and quality, has been placed in an adjacent upland confined disposal facility (CDF) on the southern side of the canal. The USACE proposes this beneficial use of dredged material from the Cape May Canal possessing greater than 90% clean sand for maintenance dredging operations. For all future annual maintenance dredging operations in the canal that entail material tested to contain less than 90% sand, the material will continue to be placed in the upland CDF.

Previous National Environmental Policy Act (NEPA) reports document updates and changes made for the applicable project - the proposed new placement area, the Lower Cape May Meadows – Cape May Point CSRM/Environmental Restoration Project (The Meadows). The USACE completed a Final Feasibility Report and Final Environmental Impact Statement (EIS), dated August 1998 for The Meadows project. Additionally, supplemental Environmental Assessments (EA) was completed in 2002 and 2008 to address changes in borrow area locations for the project (USACE, 1998, 2002, 2008). In the interest of brevity, the information contained in these reports is not repeated in this document and is incorporated by reference. New pertinent information and changes to the placement plan are addressed in this document.

2.0 PURPOSE AND NEED

As part of the authorized NJIWW project, the USACE conducts maintenance dredging operations of the Cape May Canal annually to maintain needed depths for navigation. In the fall 2017, the USACE plans to use the Government Dredge Currituck, a small split hull hopper dredge to remove 5,000-10,000 cubic yards (cy) of material from the Cape May entrance channel at the Delaware Bay. The Currituck can transport up to 300 cubic yards of dredged material per trip to the designated placement site within the nearshore zone. This equipment is routinely utilized by the USACE, Philadelphia District for dredging Manasquan, Barnegat, and Cold Spring Inlets, and was used post-Sandy for dredging in the NJIWW near Long Beach Island.

This report documents the alternative placement locations that were evaluated for beneficial use of high quality sand obtained through maintenance dredging of the Cape May Canal navigation channel. Grain size analyses demonstrate that portions of the canal entrance channel contain >90% sand (see Section 4.2). Continued placement of the dredged material in the USACE upland CDF utilizes its limited capacity with high quality clean sand, a valuable resource that can provide a beneficial use for coastal areas that typically incur storm induced erosion. Limited capacity within the Cape May Canal CDF (Area D) would be better utilized by reserving the space for dredged materials containing higher quantities of silt (<90% sand) that is deemed unsuitable as beachfill.

3.0 ALTERNATIVES

Four alternative plans were considered in the modification of the Cape May Canal dredged material disposal plan for beneficial use (Figure 3-1).

Figure 3-1: Four alternative dredged sand placement locations.

Alternative 1: The No Action alternative is to continue to place high quality dredged sand into the Cape May Canal upland CDF. Maintenance dredging of the Cape May Canal would continue under the authorized navigation project. The NJIWW provides a safe, reliable, and operational inland navigation channel for the East Coast's largest and 5th most valuable commercial fishing fleet in the U.S. (Cape May/Wildwood) and nine U.S. Coast Guard (USCG) Stations including the Cape May training base. The USCG requires a reliable channel to fulfill their Homeland Security requirements as well as conduct search and rescue operations. The Delaware River and Bay Authority operates a ferry service between Cape May, NJ and Lewes, DE and the ferries dock in the Cape May Canal. Discontinued ferry service would result in vehicle detours of up to 183 miles. The South Jersey economy is heavily dependent on recreational and commercial fishing and tourism; these industries rely on the maintained channels of the NJIWW.

Alternative 2: The USACE evaluated the placement of Cape May Canal dredged sand within the nearshore area of the Villas, an unincorporated bayside community in Cape May County approximately 2-5 miles north of the canal entrance. Erosion has resulted in a reduction in the height and width of the beachfront, particularly in the northern sections, and much of the area lacks a continuous dune system. In 1998, the USACE conducted a study to evaluate the construction of a beach berm using dredged sand for the purpose of environmental restoration. The USACE released its report in 1999 titled: Delaware Bay

Coastline, DE & NJ, Villas and Vicinity, NJ Final Integrated Feasibility Report and Environmental Assessment. To date, construction for this project has not been funded. The Villas placement location was not selected due to the greater transport distance, requiring additional cost and construction period of time needed to complete the work.

Alternative 3: The USACE investigated the option of placing dredged sand from the Cape May Canal entrance channel in the nearshore area of Higbee Beach, located directly south of the canal entrance on Delaware Bay. The beach fronts the upland CDF and Higbee Beach Wildlife Management Area, a 1,100 acre area managed by the state of New Jersey chiefly for natural habitat and endangered, threatened and nongame wildlife. This location was not selected due to concerns that the area is not an authorized project area and has not been extensively evaluated. A natural inlet system occurs just south of Higbee Beach (Pond Creek) fronting Daveys Lake.

Alternative 4: The preferred plan is to place the dredged sand within the nearshore zone depth of closure of the authorized and constructed Lower Cape May Meadows-Cape May Point CSRM/environmental restoration project within water depths of about 8-10 feet NAVD88. The site is south of Higbee Beach approximately 1.8 miles from the canal entrance. This beneficial use of dredged material will provide a supplemental sand source to the beachfill project at Cape May Point, distributed naturally by currents within the near-field shallow water/intertidal area of the beach fronting the community of Cape May Point. Only material that has been identified as containing >90% sand will be dredged and placed within the inshore footprint of the authorized CRSR/restoration project area.

The Meadows beach restoration project was initially constructed in 2005 and provides a protective vegetated dune and sand beach berm to both the developed community of Cape May Point and the undeveloped eastern portion, the planting of emergent wetland vegetation interior to the dune, excavation of drainage ditches to restore freshwater flow and the creation of ponds provides habitat for migratory and resident species. The Meadows project has a periodic nourishment schedule every 4 years. The sand would provide a small supplemental source to the westernmost portion of the beachfill project at Cape May Point. Historical aerial photography conclusively shows that the direction of movement of the shoals off Cape May City and the Meadows (1900s to recent) is towards Cape May Point and the Delaware Bay entrance and then clockwise around the Point. The wave-induced net longshore transport along the Cape May Meadows shoreline is towards Cape May Point at about 313,000 cy/year and decreases to an average of about 158,000 cy/year along the Cape May Point groin field.

AFFECTED ENVIRONMENT

The southernmost area of the Cape May Peninsula is predominantly comprised of developed residential communities, recreational and resort beaches on both the Delaware Bay and the Atlantic Ocean, undeveloped wildlife management areas and the Cape May Canal inland navigation channel. On the Atlantic Ocean side there are barrier beaches and a back barrier lagoon system; while the beaches and saltmarshes on the Delaware Bay side front inland wetlands, intermittent ponds, hardwood and white cedar swamps, upland forests, and agricultural areas.

4.1 Terrestrial

Native vegetation is minimal on the Atlantic Ocean side of Cape May due to extensive development in the area. On the bay side, the Villas community have more native vegetation in and around the community. The dominant dune plant is American beachgrass (*Ammophila breviligulata*). Other dune species include seaside goldenrod (*Solidago sempervirens*), sea-rocket (*Cakile edentula*) and beach cocklebur (*Xanthium echinatum*).

The vegetation within The Meadows environmental restoration project area as well as the Higbee Beach Wildlife Management Area is unique in its natural diversity, comprising several successional communities. Other natural areas include the Nature Conservancy's South Cape May Migratory Bird Refuge and Cape May Point State Park. The area is considered the geographic merging point for many northern and southern species. Plants typical of this area are those adapted to the dynamic environment of salt air, high winds, and variable moisture content. Upland vegetation is primarily confined to forested and old field/scrub shrub areas and include sassafras (*Sassafras albidum*), common persimmon (*Diospyros virginiana*), black oak (*Quercus velutina*), white oak (*Quercus alba*), and red maple (*Acer rubrum*). Evergreen species found in the area include American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), and pitch pine (*Pinus rigida*).

Understory species and species located in the old field/scrub shrub habitats include sumac (*Rhus sp.*), poison ivy (*Rhus radicans*), briers (*Smilax sp.*), rose (*Rosa sp.*), marsh elder (*Iva frutescens*), bayberry (*Myrica pensylvanica*), wax-myrtle (*Myrica cerifera*), seaside goldenrod (*Solidago sempervirens*), sheep sorrel (*Rumex acetosella*), sweet everlasting (*Gnaphalium obtusifolium*), purple vetch (*Vicia americana*), Japanese honeysuckle (*Lonicera japonica*), and *Polygonum sp.* (Biohabitats, Inc., 1996).

The supralittoral zone lies below the dune and above the intertidal zone and is generally only covered by water during periods of extremely high tides and large storm waves. It is sparsely vegetated. The most active invertebrates in this zone are the ghost crab (*Ocypode quadrata*, amphipods (*Talitridae*), predatory and scavenger beetles and other transient animals may be found in this zone.

The southern Cape May Penninsula is considered a birding mecca, one of the top 10 birding "hot spots" in the country with more than 400 species of birds spotted. Many species of shorebirds inhabit the beach during the spring and fall migrations, although most are even more likely to be found on more protected sand and mud flats and tidal marshes than on beaches populated with humans. Migratory shorebird visitors include sanderling (*Calidris alba*), dunlin (*C. alpina*), semipalmated sandpiper (*C. pusilla*), western sandpiper (*C. mauri*), least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), and willet (*Catoptrophorus semipalmatus*). Sanderling, dunlin, and western sandpiper also occur on the beach throughout the winter. Nesting birds such as common tern (*Sterna hirundo*), least tern (*Sterna antillarum*), black skimmer (*Rynchops niger*), and American oystercatcher (*Haematopus palliatus*) are frequent spring and summer inhabitants on unvegetated dunes and upper beaches within the study area. Several species of gulls are common along New Jersey's shores, and are attracted to forage on components of the beach wrack such as carrion and plant parts. These gulls include the laughing gull (*Larus atricilla*), herring gull (*L. argentatus*), and ring-billed gull (*L. delawarensis*).

The majority of mammals, with the exception of squirrels, are active at night. Common mammals include raccoon (*Procyon lotor*), white-tail deer (*Odocoileus virginianus*), cottontail rabbit (*Sylvilagus floridanus*), muskrat (*Ondatra zibethicus*), bats (*Lasionycteris noctivagans* and *Lasiurus borealis*), opossum (*Didelphis virginiana*), skunk (*Mephitis mephitis*), and fox (*Vulpes vulpes*).

4.2 Aquatic

According to New Jersey regulations (N.J.A.C. 7:9B-1.12), the majority of surface waters in the vicinity of the NJIWW have an NJDEP classification of SE-1 (estuarine). Tidal water bodies classified as SE-1 are estuarine waters with the designated uses of:

- Shellfish harvesting in accordance with N.J.A.C. 7:12;
- maintenance, migration and propagation of natural and established biota;
- primary and secondary contact recreation; and any other reasonable uses.

4.2.1 Water Quality

Water quality within the coastal waters of New Jersey is comparable to that of similar coastal water bodies along the New York Bight and is indicative of similar coastal tidal river and estuary complexes along the Mid-Atlantic coast (USFWS, 1997). The quality of water in this coastal region is dependent largely on tides, season, ocean current fluctuations, nutrient enrichment, water depth, biotic communities, and other temporal and spatial variables.

Studies conducted on the bays and estuaries in the vicinity of the NJIWW indicate that water quality has historically been impacted by pollutants such as nutrients, pathogens,

heavy metals and fecal coliform bacteria. As a result, habitat for fish and wildlife has been degraded in many areas relative to historical pre-developed conditions

4.2.2 Sediment Quality

To characterize Delaware Estuary sediment chemistry, NOAA's Center for Coastal Monitoring and Assessment conducted a study (Hartwell *et al*., 2001) to characterize the entire system. They found that specific locations within the tidal-fresh portion of the upper down to below the C&D Canal were contaminated, with chemical concentrations at stations either high or low for all analyzed constituents. Sediment grain size data for 73 mainstem sites showed varied composition from 73% silt at one upper estuary station to >99% sand at 9 lower bay sites. Sites with sand components had lower concentrations of contaminants than sites with a significant proportion of silt/clay. Chemical concentrations at the lower bay mainstem sites as well as the coastal stations of the bay proper were basically uncontaminated beyond trace levels.

4.2.3 Macroinvertebrates

The intertidal zone contains shifting fauna that are primarily food-filtering organisms. Most are rapid burrowers. This zone contains a mixture of herbivores, primary carnivores, and some high order carnivores such as the mole crab (*Emerita* sp.). A number of interstitial animals (meiofauna) are present feeding among the sand grains for bacteria and unicellular algae, which are important in the beach food chain.

The nearshore coastal zone generally extends seaward and is the primary area of longshore transport of coastal sediments. This zone is the area of cresting waves and is a flat zone of variable width where it meets with the offshore zone. Phytoplankton and zooplankton occur in the nearshore zone. Seasonal shifts in species dominance of phytoplankton are frequent. Dinoflagellates are generally abundant from summer through fall, and diatoms are dominant during the winter and early spring. Zooplankton represent microscopic organisms or early life stages of marine animals adrift in the water column. Seasonal peaks in abundance of zooplankton distinctly correlate with seasonal phytoplankton peaks. Macroinvertebrate phyla include Cnidaria (corals, anemones, jellyfish), Platyhelminthes (flatworms), Nemertinea (ribbon worms), Nematoda (roundworms), Bryozoa, Mollusca (chitons, clams, mussels), Echinodermata (sea urchins, sea cucumbers, sand dollars, starfish), the Urochordata (tunicates), and blue crab (*Callinectes sapidus*).

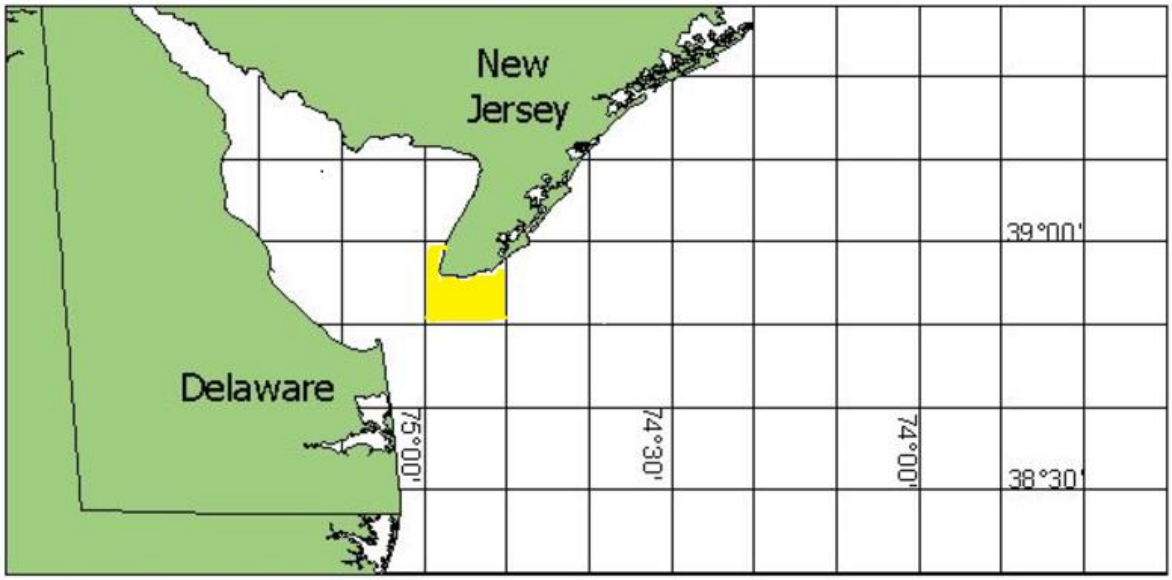
4.2.4 Fish

Over 40 species of saltwater fish can be commonly found in the ocean and bay area around Cape May. Frequent year-round residents include the Atlantic silverside (*Menidia menidia*), mummichog (*Fundulus heteroclitus*), winter flounder (*Pseudopleuronectes americanus*), and tidewater silversides (*Menidia beryllina*). Most species are seasonal migrants. Winter is a time of low abundance and diversity as most species leave the area for warmer waters offshore and southward. During the spring,

increasing numbers of fish are attracted to the New Jersey Coast, because of its proximity to several estuaries which are utilized by these fish for spawning and nurseries. Seasonal species known to utilize backwaters and marshes include summer flounder (*Paralichtys dentatus*), sea bass (*Centropristis striata*), striped bass (*Morone saxatilis*), weakfish (*Cynoscion regalis*), scup (*Stenotomus chrysops*), white perch (*Morone americana*), Atlantic menhaden (*Brevoortia tyrannus*)and bluefish (*Pomatomus saltatrix*).

4.2.5 Essential Fish Habitat (EFH)

Under provisions of the reauthorized Magnuson-Stevens Fishery Conservation and Management Act of 1996, the study area is designated as Essential Fish Habitat (EFH) for species with Fishery Management Plans (FMPs), and their important prey species. The National Marine Fisheries Service has identified EFH within 10 minute X 10 minute squares. The study areas contain EFH for various life stages for 24 species of managed fish and shellfish (Figure 4-1). Table 1 presents the managed species and their life stage that EFH is identified for within the corresponding 10 X 10 minute square that cover the study area. The habitat requirements for identified EFH species and their representative life stages are provided in Table 2.



10' x 10' Square Coordinates:

Boundary	North	East	South	West
Coordinate	39° 00.0 N	74° 50.0 W	38° 50.0 N	75° 00.0 W

Figure 4-1: Project area Essential Fish Habitat 10' x 10' Square (highlighted).

<u>Square Description:</u> Waters within the square 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 1: Essential Fish Habitat managed species and their life stages

Species	**Eggs**	**Larvae**	**Juveniles**	**Adults**
Atlantic cod *(Gadus morhua)*				X
haddock *(Melanogrammus aeglefinus)*				
pollock *(Pollachius virens)*				
whiting *(Merluccius bilinearis)*				
red hake *(Urophycis chuss)*	X	X	X	
white hake *(Urophycis tenuis)*				
redfish *(Sebastes fasciatus)*	n/a			
witch flounder *(Glyptocephalus cynoglossus)*				
winter flounder *(Pseudopleuronectes americanus)*	X	X	X	X
yellowtail flounder *(Limanda ferruginea)*				
windowpane flounder *(Scophthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*				
ocean pout *(Macrozoarces americanus)*				
Atlantic sea scallop *(Placopecten magellanicus)*				

Atlantic sea herring *(Clupea harengus)*			X	X
monkfish *(Lophius americanus)*	X	X		
bluefish *(Pomatomus saltatrix)*			X	X
long finned squid *(Loligo pealeii)*	n/a	n/a		
Atlantic butterfish *(Peprilus triacanthus)*		X	X	X
Atlantic mackerel *(Scomber scombrus)*				
summer flounder *(Paralichthys dentatus)*		X	X	X
scup *(Stenotomus chrysops)*	n/a	n/a	X	X
black sea bass *(Centropristis striata)*	n/a		X	X
surf clam *(Spisula solidissima)*	n/a	n/a		
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a		
tilefish *(Lopholatilus chamaeleonticeps)*				
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 *(Carcharias taurus)*		X		X
Atlantic angel shark *(Squatina dumerili)*		X	X	X
Atl. sharpnose shark *(Rhizopriondon terraenovae)*				X
dusky shark *(Carcharhinus obscurus)*		X		
sandbar shark *(Carcharhinus plumbeus)*		X	X	X

sandbar shark *(Carcharhinus plumbeus)*		HAPC	HAPC	HAPC
tiger shark *(Galeocerdo cuvieri)*		X		
scalloped hammerhead shark *(Sphyrna lewini)*			X	
clearnose skate (*Raja eglanteria*)			X	X
little skate (*Leucoraja erinacea*)			X	X
winter skate (*Leucoraja ocellata*)			X	X

Table 2: Habitat utilization of identified EFH species and summary of life history requirements for the 10'x10' square.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Atlantic cod *(Gadus morhua)* (Fahay, 1998)				**Habitat:** Bottom (rocks, pebbles, or gravel) winter for Mid-Atlantic **Prey:** shellfish, crabs, and other crustaceans (amphipods) and polychaetes, squid and fish (capelin redfish, herring, plaice, haddock).
Red hake *(Urophycis chuss)* (Steimle et al. 1998)	**Habitat:** Surface waters, May – Nov.	**Habitat:** Surface waters, May –Dec. Abundant in mid-and outer continental shelf of Mid-Atl. Bight. **Prey:** copepods and other 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).	
Winter Flounder (*Pseudopleuronectes americanus*) (Pereira et. al., 1998)	**Habitat:** Demersal, nearshore low energy (primarily inlets and coves) shallows with sand, muddy sand, mud and gravel bottoms.	**Habitat:** Demersal, nearshore low (primarily inlets and coves) energy shallows with sand, muddy sand, mud and gravel bottoms. **Prey:** Nauplii, invertebrate eggs, Protozoans, Polychaetes	**Habitat:** Young of the year (YOY) are demersal, nearshore low (primarily inlets and coves) energy shallows with sand, muddy sand, mud and gravel bottoms. **Prey:** YOY Amphipods and annelids JUV – Sand dollar, Bivalve siphons, Annelids,	**Habitat:** Demersal offshore (in spring) except when spawning where they are in shallow inshore waters (fall). **Prey:** Amphipods, Polychaetes, Bivalves or siphons, Capelin eggs, Crustaceans

Table 2: Habitat utilization of identified EFH species and summary of life history requirements for the 10'x10' square.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
			Amphipods	
Windowpane flounder *(Scopthalmus aquosus)* (Chang, 1998)	**Habitat:** Surface waters <70 m, Feb-July; Sept-Nov.	**Habitat:** Initially in pelagic waters, then bottom <70m,. May-July and Oct-Nov. **Prey:** copepods and other zooplankton	**Habitat:** Bottom (fine sands) 5-125m in depth, in nearshore bays and estuaries less than 75 m **Prey**: small crustaceans (mysids and decapod shrimp) polychaetes and various fish larvae	**Habitat:** Bottom (fine sands), peak spawning in May , in nearshore bays and estuaries less than 75 m **Prey**: small crustaceans (mysids and decapod shrimp) polychaetes and various fish larvae
Atlantic sea herring *(Clupea harengus)* (Reid et al., 1998)			**Habitat:** Pelagic waters and bottom, < 10 C and 15-130 m depths **Prey:** zooplankton (copepods, decapod larvae, cirriped larvae, cladocerans, and pelecypod larvae)	**Habitat:** Pelagic waters and bottom habitats; **Prey:** chaetognath, euphausiids, pteropods and copepods.
Monkfish *(Lophius americanus)* (Steimle et al., 1998)	**Habitat:** Surface waters, Mar. – Sept. peak in June in upper water column of inner to mid continental shelf	**Habitat:** Pelagic waters in depths of 15 – 1000 m along mid-shelf also found in surf zone **Prey:** zooplankton (copepods, crustacean larvae, chaetognaths)		
Bluefish *(Pomatomus saltatrix)* (Fahay *et al.*, 1999)			**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
Atlantic butterfish *(Peprilus tricanthus)* Cross *et al*., 1999)		**Habitat:** Pelagic waters greater than 33' deep	**Habitat:** Pelagic waters in 10 – 360 m	**Habitat:** Pelagic waters **Prey:** Jellyfish, crustaceans, worms, small fish
Summer flounder *(Paralicthys dentatus)* (Packer *et al.*, 1999)		**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)* (Steimle *et al.*, 1999)	n/a	n/a	**Habitat:** Demersal waters	**Habitat:** Demersal waters offshore from Nov – April **Prey:** Small benthic invertebrates
Black sea bass *(Centropristus striata)* (Drohan *et al.*, 2007)	n/a		**Habitat:** Demersal waters over rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas	**Habitat:** Demersal waters over structured habitats (natural and man-made), and sand and shell areas **Prey:** Benthic and near bottom inverts, small fish, squid
King mackerel *(Scomberomorus*	**Habitat:** Pelagic	**Habitat:** Pelagic	**Habitat:** Pelagic	**Habitat:** Pelagic waters

Table 2: Habitat utilization of identified EFH species and summary of life history requirements for the 10'x10' square.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
cavalla)	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.	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	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	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 shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** Zooplankton, fish eggs	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** 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. 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
Sand tiger shark *(Odontaspis taurus)** *Candidate species for listing under Endangered Species Act		**Habitat:** Shallow coastal waters, bottom or demersal		**Habitat:** Shallow coastal waters, bottom or demersal **Prey**: Crabs, squid, small fish
Atlantic angel shark (*Squatina dumerili*)		**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters, bottom (sand or mud near reefs)
Atl. sharpnose shark (*Rhizopriondon terraenovae*)				**Habitat:** Shallow coastal waters
Dusky shark *(Charcharinus obscurus)*		**Habitat:** Shallow coastal waters		
Sandbar shark *(Charcharinus plumbeus)*		**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters
Tiger shark *(Galeocerdo cuvieri)*		**Habitat:** Shallow coastal waters		
Scalloped hammerhead shark (*Sphyrna lewini*)			**Habitat:** Shallow coastal waters	
Clearnose skate (*Raja eglanteria*) (Packer *et al.*, 2003)			**Habitat:** Shallow coastal waters in summer and fall.	Habitat: offshore. Rare in inshore waters during winter and spring. Prey: polychaetes, amphipods, shrimp, crabs, small fish.
Little skate ((*Leucoraja erinacea*)			**Habitat:** Shallow coastal waters in	**Habitat:** Shallow coastal waters in

Table 2: Habitat utilization of identified EFH species and summary of life history requirements for the 10'x10' square.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
(Packer *et al*., 2003)			summer, offshore > 300 m in winter.	summer, offshore up to 300 m in winter. **Prey:** crabs, shrimp, polychaetes, amphipods, ascidians, bivalves, squid, fishes.
winter skate (*Leucoraja ocellata*) Packer *et al*., 2003)			**Habitat:** Shallow coastal waters in summer, offshore up to 300 m in winter.	**Habitat:** Shallow coastal waters in summer, offshore up to 300 m in winter. **Prey:** crabs, shrimp, polychaetes, amphipods, ascidians, bivalves, squid, fishes

https://www.nefsc.noaa.gov/nefsc/habitat/efh/

4.3 Threatened and Endangered Species

The federally-listed (threatened) and state-listed (endangered) piping plover (*Charadrius melodus*) can currently be found nesting within the study area, according to NJDEP and U.S. Fish and Wildlife Service field surveys. Birds have nested in Cape May City since 1997 and along the Coast Guard beaches since at least 1988. The Meadows project area had supported nesting plovers since at least 1988 but in the last 3-4 years the number of nesting plovers has declined. Numbers of nesting plovers at the Cape May National Wildlife Refuge, the Cape May Coast Guard (LSU) station, and Training Center, the Nature Conservancy and Cape May Point State park are all likewise down in recent years to either 1 or no nesting pairs. Piping plovers nest above the high tide line on mainland coastal beaches, sand flats, and barrier island coastal beaches. Nesting sites are typically located on gently sloping foredunes, blowout areas behind primary dunes, washover areas cut into or between dunes, ends of sand spits, and on sites with deposits of suitable dredged or pumped sand. The nesting season usually begins in March when the birds arrive and can extend as late as the end of August. Shortly after hatching, the young leave the nest and begin foraging within the intertidal zone.

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. No extant occurrences of the seabeach amaranth are known within the proposed project area.

The red knot (*Calidris canutus rufa*) is a Federally-threatened shorebird species that

migrates into the area around Cape May during spring and fall. Some birds may also be found lingering in the area through the early winter. The red knot's spring migration to this area is timed with the release of horseshoe crab eggs. This generally abundant food supply helps the red knot to increase its body weight enough to be able to continue its migration to the red knot's arctic breeding grounds.

The National Marine Fisheries Service (NMFS) 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. The northern diamondback terrapin (*Malaclemys terrapin terrapin*) is a Federal Category 2 candidate species that occupies shallow bay waters, and nests on the sandy portions of bay islands as well as the barrier islands themselves. The diamondback terrapin is considered a candidate species, as its nesting habitat is dwindling.

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.

4.4 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 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, a cultural resource investigation was conducted in 1997. The findings of this investigation are found in the report titled, *Phase I Submerged and Shoreline Cultural Resources Investigations, Lower Cape May Meadows, Cape May City, Lower Township and the Borough of Cape May Point, Cape May County, New Jersey* prepared for the USACE by Dolan Research, Inc. and Hunter Research, Inc.

No evidence of prehistoric terrestrial archaeological resources was noted in the shoreline survey area, the offshore sand borrow areas or the nearshore sand placement area. By

"terrestrial archaeological resources" is meant resources that were originally formed on land. The potential for such remains is unclear, in part because of the difficulties of reconstructing the paleo-environment, but the prospect of significant archaeological survivals is probably quite limited owing to ongoing coastal erosion. If buried resources do indeed survive within the shoreline survey areas, the beach replenishment process should serve to enhance resource preservation and protection. No further survey-level investigation for these types of resources is recommended.

Comprehensive remote sensing of the nearshore area resulted in the identification of nine anomalies. None of the anomalies exhibited characteristics suggestive of submerged cultural resources; therefore, no further investigation is justified.

The largest group of historic remains identified by the terrestrial field survey are those associated with the World War II era fortifications and surface debris associated with the second Cape May Lighthouse site. These cultural resources are potentially eligible for listing in the National Register of Historic Places (NRHP); however, the deposition of sediments within the nearshore areas will not adversely impact these structures, but may serve to preserve them in place.

4.5 Air Quality and Noise

Cape May County, New Jersey where the proposed Federal action will take place, is classified as marginal nonattainment for 8-hour ozone (oxides of nitrogen [NOx] and volatile organic compounds [VOCs]). The project sites are within the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE nonattainment area. A nonattainment area is an area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national ambient air quality standard (NAAQS) for the pollutant.

Locally, the project area is comprised primarily of resort residential homes, marinas, and surrounding wildlife management areas. Air quality for Cape May Point is recorded as 97.14% good/2.86% moderate (for Jan-May 2017; www.homefacts.com).

5.0 ENVIRONMENTAL IMPACTS

The no action alternative would entail the continued practice of disposing of high quality clean sand in the upland CDF rather than retaining the sand within the intertidal/beach interface. The Lower Cape May Meadows – Cape May Point Environmental Restoration project would continue to receive periodic nourishments every four years for the life of the project. Potential impacts to the nearshore beach placement area are presented in USACE (1980 and 1998). Temporary elevated turbidity and impacts to benthic resources within the placement zone would continue to occur with each periodic placement in the absence of the beneficial use of sand. As a result of initial beachfill placement and subsequent nourishment cycles, piping plovers have nested fairly consistently along the beaches of Cape May City and The Meadows for the past several years. The supplemental sand from the Cape May Canal Entrance Channel, proposed for placement within the nearshore zone at Cape May Point (*i.e.* at the westernmost end of The Meadows authorized project), would supplement the beachfill project and pose no adverse impacts to piping plover habitat at the undeveloped portion of The Meadows Environmental Restoration project where plover feeding ponds were established behind the barrier beachfront.

The environmental impacts associated with modifying the current disposal plan for the Cape May Canal maintenance dredged sand focus primarily on the inshore shallow water area, the beach, and the species that inhabit these areas. No impacts are anticipated to occur to interior wetlands, scrub shrub or forested habitats. The Cape May Canal was constructed in 1942 and has been dredged approximately annually to the authorized depth of 12 feet mlw, where shoaling occurs. Impacts resulting from the proposed placement at the alternative sites, including the No Action alternative (*i.e.* continued upland CDF disposal) are evaluated below.

5.1 Terrestrial

Minimal adverse impacts to terrestrial flora and fauna will occur under the No Action alternative at the upland CDF to continue the existing disposal plan for maintenance dredge material. The site is predominantly sand with little to no vegetation. The majority of species that would be expected to occur in the CDF are transient visitors, such as small mammals and reptiles. Beach nesting birds, such as terns and oyster catchers favor sites with little to no vegetation however none have been observed congregating or nesting within the upland CDF. The No Action alternative would not provide any benefit to nearby beach habitat. No adverse impacts to terrestrial flora and fauna are expected to occur with the proposal to modify the current disposal plan and place dredged sand in the nearshore area of any of the alternative locations (*i.e.* The Villas, Higbee Beach or the preferred plan The Meadows).

For the TSP, the deposition of high quality sand in the nearshore zone of Cape May Point would serve as a supplemental source of sand for the beachfill project. Due to placement within shallow water, most of the sand will remain in the nearshore zone with minimal natural dispersion by currents. Existing adjacent dune vegetation, adjacent scrub shrub,

interior wetlands, or maritime forest, would not be disturbed by the inshore placement activities and may benefit from the additional sand supply to beaches for additional storm protection.

5.2 Aquatic

5.2.1 Water Quality

Maintenance dredging of the entrance channel will result is temporary minor localized turbidity that will be quickly dispersed by currents and tidal flow in and out of the canal. There would be no impacts to water quality at the placement site under the No Action plan to continue to place dredged material in the upland CDF. The dredged slurry is contained within the upland CDF and sediments settle within the confines of the CDF prior to release of the effluent through a sluice gate back to the canal. The impacts associated with beneficial use dredged sand with placement within the nearshore zone of the proposed alternatives is a minor localized and short-term increase in turbidity within the nearshore zone. The quantity to be placed is small (5,000-10,000 cy) and is large grained sand material that settles quickly. The placement zone is within the swash zone where natural turbidity is elevated due to cresting waves. Tidal currents and circulation would negate any impacts from turbidity. Best Management Practices (BMPs) would be used, including nosing the hopper dredge as close into the beach as depths allow, thereby shortening the water column load fall and minimizing turbidity. No long-term adverse impacts are anticipated.

At the alternative placement sites evaluated, there is concern that longshore transport within this area has not been evaluated at the nearshore zone of Higbee Beach and may result in interference of circulation at the Pond Creek inlet. Placement within the nearshore zone at the Villas was eliminated as an alternative site due to its distance from the canal, adding time and cost to the annual maintenance program.

5.2.2 Sediment Quality

No impacts would result from the No Action alternative. The dredged clean sand would continue to be placed in the contained upland CDF with controlled drainage. Materials with large grain sizes (>90% sand) are typically not contaminated and chemical testing is not required. The 1998 Inland Testing Manual (EPA-823-B-98-004) provides national guidance on the evaluation of dredged material under the Clean Water Act. It states that no chemical analysis is required if there is a "*reasonable assurance that the proposed discharge material is not a carrier of contaminants…. For example, dredged material is most likely to be free of contaminants if the material is composed primarily of sand, gravel, or other inert material and is found in areas of high current or wave energy* [230.60(a)].

Placement of clean dredged sand within the nearshore zone of The Meadows authorized beachfill project or the alternative beach sites would not be expected to pose any impacts

to sediment quality or the environment based on the results of recent grain size sediment testing (Tetra Tech, unpublished data 2014, 2017).

5.2.3 Macroinvertebrates

Under the No Action alternative of continued placement of maintenance dredged material into the upland CDF, there will be no impacts to marine invertebrate organisms. Potential minor impacts to benthic organisms under the alternative placement sites, including the preferred site, would occur in the nearshore and intertidal zones. The nearshore and intertidal zone is highly dynamic, harsh, and is characterized by great variations in various abiotic factors. Fauna of the intertidal zone are highly mobile and respond to stress by displaying large diurnal, tidal, and seasonal fluctuations in population density (Reilly *et al.* 1983). Given the small quantities of sand material placed with each hopper dredge load (250-300 cy), it is unlikely that intertidal benthic fauna that are resilient in high energy environments will be smothered by the sand placements within the shallow water area. Most nearshore macroinvertebrates in the turbulent nearshore zone can migrate through the surface sand layers and is resilient to this type of disturbance (Parr *et al.*, 1978). Smothering and mortality may occur in lesser mobile species (*e.g.* amphipods and polychaetes) within the small area of placement. Given the shallow water depths of the placement area, the large grain size of the sediment and the small size of the hopper load, the material will settle quickly (*i.e.* minutes) within the interval periods of dredging and transiting time between each deposit. Recovery of the macrofaunal community may occur within one or two seasons when the placed sand is compatible with the natural beach sediments (Reilly *et al.*, 1978). Macrofauna recover quickly due to their short life cycles, high reproductive potential, and planktonic recruitment from unaffected areas (Hurme and Pullen, 1988).

Primary production in phytoplankton and/or benthic algae may become inhibited from turbidity. Reilly *et.al.* (1983) determined that high turbidity could inhibit recruitment by pelagic larval stocks. Midwater nekton like finfish and mobile benthic invertebrates may migrate outside of the area where turbidity and deposition occur. The nearshore environment is a naturally turbid area due to cresting waves. Organisms in the surf zone are less likely to suffer adverse effects from turbidity because they have already adapted to these conditions. The amount of turbidity and the duration of its settlement period will be short due to the large grain size of the material.

5.2.4 Fish

Under the No Action alternative, no fish would be impacted by continued placement of dredged material into the Cape May Canal CDF. Under the alternative nearshore placement alternative sites, including the preferred alternative site, adverse impacts through burial are unlikely as the majority of fish are highly mobile and able to avoid the sand deposition area turbidity plume. Impacts to fish egg and larval stages may result in the immediate area of the sand placement sites due to the temporary turbidity levels within the nearshore water column. Fish eggs and larvae are widespread throughout the Mid-Atlantic Bight and not expected to be concentrated in the littoral shallow water zone

of the alternative beaches (Grosslein and Azarovitz, 1982). The primary impact to fisheries will be felt from the disturbance of benthic and epibenthic communities. The loss of benthos and epibenthos smothered during the placement operations will occur in a small area of placement. This effect is expected to be temporary as these areas become rapidly recolonized by pioneering benthic and epibenthic species.

5.2.5 Essential Fish Habitat (EFH)

As presented in Section 4.2.5, there are a number of Federally-managed fish species where essential fish habitat (EFH) was identified for one or more life stages within the alternative 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 will result in a very limited area within the littoral zone of the placement site. EFH can be adversely impacted temporarily through water quality impacts such as increased turbidity and decreased dissolved oxygen content in the water column, although the littoral zone is typically turbid. These impacts would subside upon cessation of placement activities. The placement of sand compatible with natural materials is not expected to result in physical, chemical or compositional changes to bottom habitat, sediment substrate or prey item benthic species recolonization.

Also, seasonal abundances of fish species are highly variable, as many species are highly migratory. For most of the fish species in this region of Delaware Bay and Atlantic Ocean, no adverse effect is anticipated on adults and juveniles because both stages can move away from the project impact area. Minimal adverse effect on eggs and larvae is expected as they are demersal at these life stages. The placement of compatible sand within a sandy bottom habitat would not permanently degrade or destroy the EFH for any of the managed species. Table 3 provides a description of potential impacts to managed fish species.

Table 3: Direct and indirect impacts on Federally managed species and Essential Fish Habitat in 10'x10' square (EFH) IN 10 min. x 10 min. square (NOAA, 1999)

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
1. Atlantic cod *(Gadus morhua)*				Impact to physical habitat at placement areas is temporary and similar to pre-placement conditions. Potential for temporary disruption of benthic food prey organisms.
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.	Impact to physical habitat at placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.	
3. Winter flounder (Pseudop*leuronectes americanus*)	Eggs are demersal in very shallow waters of coves and inlets in Spring. Placement areas are in high energy nearshore areas where eggs are not likely to be highly concentrated.	Larvae are initially planktonic, but become more bottom-oriented as they develop. Placement areas are primarily in high energy inshore areas where larvae are not likely to be highly concentrated.	Impact to physical habitat in placement areas is temporary. These should remain basically similar to pre-placement conditions. Temporary disruption of benthic food prey organisms	Impact to physical habitat at placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.
4. 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.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.
5. Atlantic sea herring *(Clupea harengus)*			Occur in pelagic and near bottom. Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. None, prey items are planktonic	Occur in pelagic and near bottom. Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. None, prey items are primarily planktonic
6. 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.		
7. Bluefish *(Pomatomus saltatrix)*			Juvenile bluefish are pelagic species. No significant direct effects anticipated. Likely to leave the area of placement. Temporary disruption of benthic food prey organisms.	Adult bluefish are pelagic species. No significant direct effects anticipated. Likely to leave the area of placement. Temporary disruption of benthic food prey organisms.
8. Atlantic butterfish *(Peprilus tricanthus)*		Larvae occur in pelagic waters. No impacts are expected.	Juvenile butterfish are pelagic species. No significant direct effects anticipated.	Adult butterfish are pelagic species. No significant direct effects anticipated.

Table 3: Direct and indirect impacts on Federally managed species and Essential Fish Habitat in 10'x10' square (EFH) IN 10 min. x 10 min. square (NOAA, 1999)

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
			Temporary disruption of benthic food prey organisms.	Temporary disruption of benthic food prey organisms.
9. Summer flounder *(Paralicthys dentatus)*		Larvae occur in pelagic waters; therefore, no direct or indirect effects are expected.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.
10. Scup *(Stenotomus chrysops)*			Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Temporary disruption of benthic food prey organisms.
11. Black sea bass *(Centropristus striata)*			Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles prefer offshore habitat with structure. The placement sites are sandy bottom habitat. Temporary disruption of benthic food prey organisms.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults prefer offshore habitat with structure. Placement sites are sandy bottom habitat. Temporary disruption of benthic food prey organisms.
12. King mackerel *(Scomberomorus cavalla)*	Eggs are pelagic, therefore no adverse impacts are anticipated. .	Larvae are pelagic, therefore no adverse impacts are anticipated.	Juveniles are pelagic, therefore no adverse impacts are anticipated. Juveniles are not likely to feed in the placement areas. No effects on prey items. Mackerel are highly migratory.	Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. Adults are not expected to occur in the littoral zone. No effects on prey items.
13. Spanish mackerel *(Scomberomorus maculatus)*	Eggs are pelagic, therefore no adverse impacts are anticipated.	Larvae are pelagic, therefore no adverse impacts are anticipated.	Juveniles are pelagic, therefore no adverse impacts are anticipated. Juveniles are not likely to feed in the placement areas. No effects on prey items. Mackerel are highly migratory	Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. Adults are not likely to feed in the placement areas. No effects on prey items. Mackerel are highly migratory.
14. Cobia *(Rachycentron canadum)*	Eggs are pelagic, therefore no adverse impacts are anticipated.	Larvae are pelagic, therefore no adverse impacts are anticipated.	Cobia are pelagic and migratory species. No significant direct effects anticipated. Juveniles are not likely to feed in the placement areas. No effects on prey items.	Cobia are pelagic and migratory species. No significant direct effects anticipated. Adults are not likely to feed in the placement areas. No effects on prey items.
15. Sand tiger shark (*Odontaspis taurus*)		Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Neonates are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.		Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement.

Table 3: Direct and indirect impacts on Federally managed species and Essential Fish Habitat in 10'x10' square (EFH) IN 10 min. x 10 min. square (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
16. Atlantic angel shark (*Squatina dumerilli*)		Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Neonates are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites. .	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.
17. Atlantic sharpnose shark (*Rhizopriondon terraenovae*)				Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adultss are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.
18. Dusky shark *(Charcharinus obscurus)*		Present during summer months. Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Neonates are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.		
19. Sandbar shark *(Charcharinus plumbeus)*		Present during summer months. Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Neonates are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites
20. Tiger shark *(Galeocerdo cuvieri)*		Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.		
21. Scalloped hammerhead shark			Impact to physical habitat in placement	

Table 3: Direct and indirect impacts on Federally managed species and Essential Fish Habitat in 10'x10' square (EFH) IN 10 min. x 10 min. square (NOAA, 1999)				
MANAGED SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
(*Sphyrna lewini*)			areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites.	
22. Clearnose skate (*Raja eglanteria*)			Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites
23. Little skate (*Leucoraja erinacea*)			Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites
24. Winter skate (*Leucoraja ocellata*)			Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Juveniles are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites	Impact to physical habitat in placement areas is temporary and similar to pre-placement conditions. Adults are expected to vacate the area of placement Temporary disruption of benthic food prey organisms at placement sites

https://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/delaware/38507450.html
https://www.greateratlantic.fisheries.noaa.gov/hcd/skateefhmaps.htm

5.3 Threatened and Endangered Species

The piping plover, which is State listed as endangered and Federally-listed as threatened, is a frequent inhabitant of New Jersey's sandy beaches. Plovers have nested in Cape May and The Meadows for at least the past 11 years although the number of nesting plovers in the project area have dropped significantly. However, it is expected that plovers will continue to nest in these areas, especially following beach restoration activities. Plovers are not known to frequent the upland CDF and would not be expected to incur adverse impacts under the No Action alternative. Currently, the USACE is conducting plover monitoring on Cape May beaches, through the New Jersey Department of Environmental Protection, Division of Fish and Wildlife and the U.S. Fish and Wildlife Service. This practice will continue throughout the life of Cape May City beach restoration project, or until such time as the duty is handed over to the local municipalities. Similar monitoring efforts are taking place, in conjunction with NJDEP and The Nature Conservancy, at The Meadows project area. In addition, protection measures laid out by NJDEP, Division of Fish and Wildlife and the U.S. Fish and Wildlife Service will be followed during all renourishment activities in order to protect the piping plovers from being disturbed. These measures may include establishing a buffer zone around the nest, and limiting construction to be conducted outside of the nesting period (15 March - 15 August). The proposed nearshore bottom placement of dredged sand is not scheduled to occur during this seasonal nesting period nor is expected to cause indirect impacts to beach foraging at any of the alternative nearshore sites.

Likewise, the Federally threatened *rufa* subspecies of the red knot (*Calidris canutus*) is not expected to incur adverse impacts as a result of either the No Action alternative or any of the alternative nearshore aquatic placements. Like piping plovers, red knots forage along the water's edge on beaches and are not expected to be in the area during the proposed placement operations (late September). If any birds are present, they will easily be able to move away from hopper dredge located in the littoral zone to another portion of the beach where they will not be disturbed.

The nearshore placement alternatives may pose an indirect impact that entails a temporary reduction in the quality of forage habitat for piping plover, red knots, and other shorebirds within the shallow water area and intertidal zone until the area becomes recolonized by benthic fauna such as polychaete worms, mollusks, and crustaceans. This impact may be short-lived as the area could become recolonized as early as a few days after placement through recruitment from adjacent areas and prior to the return of the birds during the following spring migration.

Although the species has not been identified on beaches in the vicinity of the alternative nearshore placement areas, the Federally-listed threatened plant, seabeach amaranth colonizes on sandy overwash flats and accreting ends of coastal barrier beaches and lower foredunes of non-eroding beaches. It is possible that seabeach amaranth may become naturally established within the project area since the USACE's beachfill projects within the vicinity of Cape May City and The Meadows creates habitat for the

seabeach amaranth. To address these issues, the USACE 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. Formal consultation by the USACE with the USFWS occurs for every beach nourishment project and was conducted with respect to the proposed in-water sand placement plan. It is anticipated, that the proposed plan to place 5,000-10,000 cy of sand in the nearshore zone at any of the alternative sites outside of the migratory and nesting periods will not impact threatened or endangered species.

From June through November, New Jersey's coastal waters may be inhabited by transient sea turtles, especially the loggerhead (Federally listed threatened) and the Kemp's ridley (Federally listed endangered). Endangered whales, such as the highly endangered Right whale, may also be transient visitors within the project area but are not likely to occur in the shallow nearshore zone where the placement activities will take place. The harbor porpoise (*Phocoena phocoena*), the bottlenose dolphin (*Tursiops truncatus*) and all marine mammals including the harbor seal (*Phoca vitulina concolor*) that visit the area, are protected under the Marine Mammal Protection Act. The northern diamondback terrapin (*Malaclemys terrapin terrapin*), considered a "species of special concern", occurs in the study area. The diamondback terrapin occupies brackish tidal marshes and nests on sandy bay beaches.

As with all large vessels, there is a potential for entrainment or collision of the Currituck with a sea turtle. Coordination with the National Marine Fisheries Service (NMFS) in accordance with Section 7 of the Endangered Species Act has been undertaken on all Philadelphia District Corps of Engineers dredging projects that may have impacts to Federally-threatened or endangered marine species. In accordance with Section 7 of the Endangered Species Act, a Biological Opinion was provided by the NMFS in November of 1996 and more recently in 2016. As a term and condition of the incidental take statement included in this opinion, the NMFS is requiring monitoring of all hopper dredge operations in areas where sea turtles are present between June and November by trained endangered species observers. Adherence to the findings of the Biological Opinion will insure compliance with Section 7 of the Endangered Species Act. Observers inspect the hopper, skimmer, and draghead after each load looking for signs of interaction with endangered or threatened species.

For beach nourishment projects using offshore borrow areas, the Philadelphia District requires dredges to have munition screens on the dragarms. These screens are designed to keep potentially dangerous ordnance off of public beaches. The Currituck is a small hopper dredge that works in inlets and the nearshore zone and is not likely to encounter unexploded ordnance in its operations of a maintained navigation channel. The Currituck is equipped with intake screens on the draghead. These screens make it more difficult to monitor the impacts to sea turtles as a result of the dredging operations. For this reason, NMFS has indicated that turtle monitors will no longer be required for dredging jobs

were munitions screens are being used. The Currituck has personnel that are trained in identifying marine listed species and will have an observer present during operations. Based on the available information, it has been determined that the proposed project is not likely to adversely affect the above listed threatened and endangered species. This determination has been coordinated with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

5.4 Cultural Resources

As a result of our review the District has determined that the implementation of the selected plan, as detailed in this EA, will have *No Adverse Effect* on historic properties eligible for or listed on the NRHP pursuant to 36CFR800.5.a.3.b.

5.5 Air Quality and Noise

Minimal impacts to air and noise quality would result from the No Action alternative-continued maintenance dredging of the Cape May Canal entrance channel. Minor short-term impacts to air quality and noise levels would result the Currituck dredging and transiting to the placement site (*i.e.* for about 3-4 days). These noises would be partially masked by the background levels of the surf and coastal winds or dissipated by distance. Ambient air quality would also be temporarily degraded during operations, and no long-term impacts are anticipated from the evaluated alternatives. A maintenance dredging operation is exempt from a General Conformity determination requirement. The project is not considered regionally significant under 40 CFR 93.153 (i).

5.6 Environmental Justice

All of the alternatives identified in this document, including the No Action alternative, are expected to comply with Executive Order 12989 – Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994. The regulation requires that "each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations." The proposed plan is not located in close proximity to a minority or low-income community, and no impacts are expected to occur to any minority or low-income communities in the area.

5.7 Cumulative Impacts

Cumulative impacts of modifying the disposal plan for the nearshore placement alternatives are expected to be similar to the No Action plan. Along the Atlantic Coast of New Jersey, several existing Federal, state, and local municipal beach replenishment projects have occurred in the recent past or are currently active. Two such ongoing active Federal projects are located on the lower Cape May peninsula: Lower Cape May Meadows-Cape May Point Environmental Restoration and Cape May Inlet to Lower Township. Further up the ocean coast, the state of New Jersey has conducted several

beach nourishment projects in the municipalities of Avalon, Stone Harbor, Sea Isle City, Strathmere, Southern Ocean City, and Brigantine. These beach nourishment projects utilize offshore sand sources or inlet ebb shoals, resulting in temporary impacts to marine bottom habitats. These areas would be impacted incrementally over their 50-year project life with each periodic nourishment cycle. For the preferred placement location, The Meadows CSRM/environmental restoration beachfill project is periodically nourished every four years. Benthic invertebrate species recolonize impacted sites. The Cape May Canal is dredged approximately annually. Benthic recolonization in dynamic marine nearshore zones are typically characterized by invertebrate species that maximize reproductive capacity (r-selected species) with short lifespans.

The current proposal to modify the disposal plan to place sand in the nearshore zone at Cape May Point (The Meadows project) involves sand dredged from an authorized navigation channel. The aerial extent of the dredged area (1.5 acres) and similarly sized placement location utilizing a small hopper dredge to place a small quantity (5,000 – 10,000 cy) in small loads (250-300 cy) of high quality sand in shallow nearshore water is not expected to pose any significant impacts to the environment. Placement operations can be optimized based on the conditions at the time the work is completed.

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 alternative placement sites do not contain prominent shoal habitat features, wrecks or reefs, or any known hard bottom features that would add heterogeneity to the flat sandy bottom. Some minor and temporary impacts would result in a loss of food source in the affected areas. This impact would affect demersal or bottom-feeding EFH species such as summer flounder and windowpane flounder. Coordination with the NMFS has taken place and the USACE has agreed to delay operations until after September 15th to minimize impacts to sandbar shark habitat.

The proposed modification to a navigation channel dredged material disposal plan from an upland CDF to the nearshore and intertidal area of a Federal beach restoration project serves as a beneficial use by providing a supplemental sand source to the littoral zone of the beachfill zone of closure. Cumulatively, beach restoration projects along the New Jersey coast result in temporary and minor impacts 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.

The proposed modification to the disposal plan is not expected to have a cumulative impact to the Federally-listed piping plover, red knot, or seabeach amaranth. Due to the ability to schedule these efforts during time periods of the year when the species are not likely to be present, no additional impacts will occur. Through the implementation of plover management plans and the monitoring program, impacts related to human activities near 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 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.

As a nonmobile species that occurs along the dune toe, no impacts are expected for the seabeach amaranth. The species has a very patchy distribution within southern New Jersey. The protection measures in place, in coordination with the USFWS, should ensure that impacts are avoided and not jeopardize the species.

6.0 COORDINATION

Pubic coordination for the proposed disposal plan modification has been coordinated with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the New Jersey Department of Environmental Regulation. This EA was as a draft document to the aforementioned agencies. In addition, the public was notified of the availability of this document for public review via a public notice, which was distributed to interested individuals, organization, and media outlets listed on the Philadelphia District's coastal New Jersey mailing list.

7.0 COMPLIANCE WITH ENVIRONMENTAL STATUTES

Compliance with environmental quality protection statutes and other environmental review requirements is ongoing. Table 4 provides a listing of compliance with environmental statutes. The project requires State approval pursuant to Section 401 of the Clean Water Act, Section 307 of the Coastal Zone Management Act and Section 106 of the National Historic Preservation Act. The USACE has applied for these approvals. All approvals will be obtained prior to initiation of construction.

The proposed plan presented in this EA has been coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service regarding issues related to Section 7 of the Endangered Species Act of 1977 (16 U.S. C. 1531 et seq.). This Environmental Assessment has been provided to the natural resource agencies for review and comment. Based on the analysis completed, the USACE has concluded that any effects to listed species will be insignificant or discountable and the proposed modification to the placement area is not likely to adversely affect any listed species. The USACE has requested concurrence from the USFWS and NMFS.

The project has also been coordinated with NMFS regarding Essential Fish Habitat pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (1996 amendments). The USACE has agreed to postpone operations until after September 15th, as requested by the NMFS.

This EA concludes that the proposed modification to the existing maintenance dredged material placement operations for the Cape May Canal is not a major Federal action

significantly affecting the human environment. Therefore, it has been determined that preparation of an Environmental Impact Statement is not warranted for the project as identified herein, and a Finding of No Significant Impact (FONSI) for the proposed project is appropriate.

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. Coordination with regard to the Coastal Zone Management Act has been conducted. A Section 404(b)(1) evaluation in compliance with Section 404 of the Clean Water Act was prepared (Section 9).

Table 4: Compliance with environmental quality protection statutes and Executive Orders.	
FEDERAL STATUTES	**COMPLIANCE W/PROPOSED PLAN**
Archeological - Resources Protection Act of 1979, as amended	Full
Clean Air Act, as amended	Full
Clean Water Act of 1977	partial
Coastal Barrier Resources Act	N/A
Coastal Zone Management Act of 1972, as amended	partial
Endangered Species Act of 1973, as amended	partial
Estuary Protection Act	Full
Federal Water Project Recreation Act, as amended	N/A
Fish and Wildlife Coordination Act	partial
Land and Water Conservation Fund Act, as amended	N/A
Marine Protection, Research and Sanctuaries Act	Full
Magnuson-Stevens Fishery Conservation and Management Act	partial
National Historic Preservation Act of 1966, as amended	partial
National Environmental Policy Act, as amended	partial
Rivers and Harbors Act	Full
Watershed Protection and Flood Prevention Act	N/A
Wild and Scenic River Act	N/A
Executive Orders, Memorandums, etc.	
EO 11988, Floodplain Management	Full
EO 11990, Protection of Wetlands	Full
EO12114, Environmental Effects of Major Federal Actions	Full
EO 12989, Environmental Justice in Minority Populations and Low-Income Populations	Full
County Land Use Plan	Full

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

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U.S. Army Corps of Engineers, 2008. Final Environmental Assessment (EA), Alternate Offshore Borrow Area 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.

9.0 Clean Water Act Section 404(b)(1) Evaluation

This evaluation involves the aquatic placement of sand material dredged from the Cape May Canal, Cape May County, New Jersey. Material possessing >90% sand will be beneficially used to supplement sand resources within the nearshore depth of closure zone for the Lower Cape May Meadows-Cape May Point CSRM/Environmental Restoration project (The Meadows). Previous 404(b)1 evaluations for the placement of sand at The Meadows project are presented in USACE (1980, 1998, and 2002).

I. PROJECT DESCRIPTION

A. Location

The project location is the Cape May Canal, the southernmost section of the New Jersey Intracoastal Waterway (NJIWW) in Cape May County, New Jersey. The proposed placement area is located approximately 1.8 miles south of the Cape May Canal Entrance Channel at Cape May Point within the depth of closure of the Coastal Storm Risk Management (CSRM) and environmental restoration project at the Lower Cape May Meadows (The Meadows)-Cape May Point.

B. General Description

As part of the authorized NJIWW project, the USACE conducts maintenance dredging operations of the Cape May Canal annually to maintain needed depths for navigation. The purpose of The Meadows environmental restoration project is to restore the beach berm to provide both storm erosion protection to both the community of Cape May Point and to natural habitat and restored freshwater wetlands at Cape May Meadows.

C. Authority and Purpose

The New Jersey Intracoastal Waterway (NJIWW) is a sea-level inland waterway constructed in 1942 that extends along the New Jersey coast about 117 miles from the Atlantic Ocean at Manasquan Inlet to the Cape May Canal to the Delaware Bay, about 3 miles north of Cape May Point. It is maintained to a depth of up to 12 feet mean low water (mlw). The NJIWW project was adopted in 1939 (HD 76-133, 1st session). The NJIWW provides a safe, reliable and operational inland navigation channel for commercial, recreational fishing vessels, the Cape May Lewes ferry service, and nine U.S. Coast Guard stations.

The Lower Cape May Meadows-Cape May Point Environmental Restoration project was authorized for construction by Title I, Section 101 (a)(25) of WRDA 1999. The selected plan for this project included constructing a protective beach dune and berm restoration along the shoreline extending from the 3rd Avenue terminal groin in Cape May City to the Central Avenue groin in Cape May Point. Periodic nourishment occurs every four years. Initial dune and beach construction was completed in 2007 with the placement of

1,406,000 cubic yards (cy) of sand. The sand sources were obtained from offshore borrow areas.

D. General Description of Dredged or Fill Material

1. General Characteristics of Material. The proposed borrow material is large grained sand. Grain size analyses have demonstrated that the borrow material is comparable to the native beach sand. As such, the borrow material is considered ideal for berm and dune restoration.

2. Quantity of Material. The estimated quantity of >90% sand to be removed is 5,000 – 10,000 cy.

3. Source of Material. Cape May Canal Entrance Channel.

E. Description of the Proposed Discharge Site

1. Location. The proposed beachfill discharge location is the littoral zone at the westernmost portion of The Meadows environmental restoration project at Cape May Point within the depth of closure in approximately 10-12 feet MLW.

2. Size. The quantity is approximately 5,000 – 10,000 cy of sand.

3. Type of Site. The proposed discharge area is the nearshore zone of The Meadows beachfill project area.

4.

5. Type(s) of Habitat. The habitat type is marine nearshore open water.

5. Timing and Duration of Discharge.

Placement operations will not begin prior to September 15. No nesting piping plovers or spawning horseshoe crabs will be present in fall.

F. Description of Discharge Method

A split-hull small hopper dredge would be used to excavate the sandy material from the entrance channel, transit the 1.8 miles to the nearshore placement location and deposit the material (250-300 cy/load).

II. FACTUAL DETERMINATION

A. Physical Substrate Determinations

1. The sand will be placed in the water in depths of about 10-12 feet MLW. Currents will naturally disperse the material within the littoral zone.

2. **Sediment Type.** The sediment type involved would be sandy beachfill material (90% or greater of fine, medium and coarse sands and gravels).

3. **Dredged/Fill Material Movement.** The material will be naturally dispersed within the nearshore swash zone by currents.

4. **Physical Effects on Benthos.** The proposed marine placement of dredged sand in 250-300 cy loads may result in initial burial of some nearshore benthic organisms. Substrate is composed of material that is similar to existing substrate, which is expected to become recolonized by the same type of benthos through recruitment from adjacent areas. Maintenance dredging of the Cape May Canal is conducted approximately annually to maintain the 12 foot authorized depth. Dredging will result in the removal of the benthic community. Most invertebrate species are adapted to the high energy environment within both the inlet and nearshore placement zone where waves break and are capable of migrating through the surficial layers of sand. Species will rapidly recolonize the area following dredging.

5. **Other Effects.** Other effects would include a temporary increase in turbidity but is expected to be minimal due to the short water column of the placement site. Bathymetric changes in the placement site are unlikely given the small amount of material to be placed.

6. **Actions Taken to Minimize Impacts.** Actions taken to minimize impacts include selection of only fill material that is >90% sand and similar in nature to the existing substrate and conducting the dredging outside of important beach bird nesting, foraging and horseshoe crab spawning periods.

B. <u>Water Circulation, Fluctuation, and Salinity Determinations</u>

1. Water. Consider effects on:

- **a.** **Salinity** - No effect.
- **b.** **Water chemistry** - No significant effect.
- **c.** **Clarity** - Minor short-term increase in turbidity during construction.
- **d.** **Color** - No effect.
- **e.** **Odor** - No significant effect.
- **f.** **Taste** - No effect.
- **g.** **Dissolved gas levels** - No significant effect.
- **h.** **Nutrients** - Minor effect.
- **i.** **Eutrophication** - No effect.
- **j.** **Others as appropriate** - None.

2. Current patterns and circulation

a. **Current patterns and flow** – Minor to no impacts to circulation patterns and flow in the nearshore where the existing circulation pattern will disperse sediments to a natural configuration in the swash zone.

b. **Velocity** - No effects on tidal velocity and longshore current velocity regimes.

c. **Stratification** - Thermal stratification normally occurs beyond the mixing region created by the surf zone. The normal pattern should continue after construction of the proposed project.

d. **Hydrologic regime** - The regime is largely tidal marine and oceanic. This will remain the case following construction of the proposed project.

3. **Normal water level fluctuations** - The tides are semidiurnal. The mean tide range is reported to be 4.1 feet in the Tide Tables published annually by the National Oceanic and Atmospheric Administration (NOAA). The spring tide range is reported as 5.0 feet. Placement operations within the nearshore zone would not affect the tidal regime.

4. **Salinity gradients** - There should be no significant effect on the existing salinity gradients.

5. **Actions that will be taken to minimize impacts**- None are required as the proposed construction will occur outside of important environmental windows.

C. <u>Suspended Particulate/Turbidity Determinations</u>

1. **Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the nearshore placement site** - There would be a short-term elevation of suspended particulate concentrations during placement and in the vicinity of the dredging.

2. **Effects (degree and duration) on Chemical and Physical Properties of the Water Column** -

a. **Light penetration** - Short-term, limited reductions would be expected at the dredge site and discharge site.

b. **Dissolved oxygen** - There is a potential for a temporary decrease in dissolved oxygen levels but the anticipated low levels of

organics in the borrow material should not generate a high, if any, oxygen demand.

c. **Toxic metals and organics** - Because the borrow material is 90% or more sand, and originates from areas where no known sources of significant contamination exist, the material is expected to be free of any significant contamination in accordance with 40 CFR 227.13(b).

d. **Pathogens** - Pathogenic organisms are not known or expected to be a problem in the borrow areas. Therefore, nearshore placement is not expected to significantly increase indicator bacteria levels above normal conditions.

e. **Aesthetics** - Construction activities associated with the sand placement site would result in a minor, short-term degradation of aesthetics. This is due to the temporary impacts to noise, sight, and smell associated with the dredge.

3. **Effects on Biota**

a. **Primary production, photosynthesis** - Minor, short-term effects related to turbidity.

b. **Suspension/filter feeders** - Minor, short-term effects related to suspended particulates outside the immediate deposition zone. Sessile organisms would be subject to burial if within the deposition area.

c. **Sight feeders** - Minor, short-term effects related to turbidity.

4. **Actions taken to minimize impacts** include the beneficial use placement of clean sand with a small fine grain component and a low organic content. Standard construction practices would also be employed to minimize turbidity (*e.g.* nosing the hopper dredge in close to shore to reduce the water column height and load fall).

D. Contaminant Determinations

The discharge material is not expected to introduce, relocate, or increase contaminant levels at either the dredging or placement site. This is assumed based on the characteristics of the sediment dredged nearly annually and no proximity to sources of contamination, the area's hydrodynamic regime, and existing water quality. In accordance with 40 CFR 227.13(b), the dredged material is not expected to contain any significant contamination.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton - The effects on plankton should be minor and mostly related to light level reduction due to turbidity. Significant dissolved oxygen level reductions are not anticipated.

2. Effects on Benthos – Removal of benthic invertebrates will occur in the entrance channel dredging area. The area undergoes maintenance dredging nearly annually to maintain the authorized -12 foot depth (mlw). The losses of benthic organisms are somewhat offset by the expected rapid opportunistic recolonization from adjacent areas that would occur following cessation of dredging. Some loss of benthic organisms will also occur at the nearshore placement area. However, sand is placed in 250-300 cy loads in between transit and dredging periods and some benthic organisms are capable of horizontal migration. Pelagic larval recruitment will also contribute to recolonization in the nearshore zone.

3. Effects on Nekton - Only a temporary displacement is expected, as the nekton would probably avoid the active work area.

4. Effects on Aquatic Food Web – Localized minor impacts in the affected areasdue to loss of benthos as a food source through burial at the nearshore site and removal at the dredging site. This is expected to be short-term as highly dynamic coastal nearshore areas recolonize by benthos within a few days or weeks and the borrow areas within a few months following the impact.

5. Effects on Special Aquatic Sites - No special aquatic sites such as sanctuaries and refuges, mud flats, vegetated shallows, coral reefs and riffle and pool complexes are present within the project area.

7. Threatened and Endangered Species - The piping plover (*Charadrius melodus*), a Federal threatened and State endangered species may potentially utilize adjacent sandy beach habitat in the spring following fall placement operations, but haven't since 2014. Monitoring to determine the presence of piping plover nesting behavior prior to placement operations occurs annually by the NJDEP to insure that the piping plovers are not impacted by placement activities.

The red knot (*Calidris canutus rufa* ssp.) may occur in the project vicinity. Although red knots can reside along New Jersey's coast and backbay areas year-round, they typical migrate through the area in spring and fall. The District will coordinate with the NJDEP Endangered Nongame Species Program prior to placement activities.

Although not currently present, it is possible that the Federally-threatened seabeach amaranth (*Amaranthus pumilus*) could become established within the vicinity of placement operations. The plant is typically found at the dune toe and will not be impacted by nearshore sand placement operations.

Several species of threatened and endangered sea turtles may be migrating through the area. Sea turtles have been known to become entrained by suction hopper dredges. Use of a hopper dredge during a time of high likely presence (June – November) in the area could potentially entrain and destroy a sea turtle(s). Dredges are required to be equipped with intake screens and the hopper dredge crew possesses a trained observer onboard at all times between June-November.

7. Other Wildlife - The proposed plan would not significantly affect other wildlife.

8. Actions to minimize impacts - Impacts to benthic resources will be minimized at the nearshore placement site through use of the small split-hull hopper dredge that releases the sand load in smaller quantities (250-300 cy). Dredging and transit time allows for currents to distribute the material in the nearshore zone and benthic organisms to migrate horizontally and out of the deposited sand. Since the Currituck hopper dredge will be used at the Cape May Canal entrance channel between June and November, measures to avoid or minimize impacts to sea turtles and other listed species will include UXO screening on the dredge intakes and a turtle monitor (bridge watch) knowledgeable in listed species identification. The draghead should not be engaged for dredging until it is resting on the bottom.

F. <u>Proposed Disposal/Discharge (Beachfill Placement) Site Determinations</u>

1. Mixing Zone Determination

a. Depth of water - 6 to-20 feet mean low water
b. Current velocity - Generally less than 3 feet per second
c. Degree of turbulence - Moderate to high
d. Stratification - None
e. Discharge vessel speed and direction - Not applicable
f. Rate of discharge – N/A (250 – 300 cy per load)
g. Dredged material characteristics – medium to coarse sands
h. Number of discharge actions per unit time – approximately 10/ per day for about 4 days depending on weather and equipment delays.

2. Determination of compliance with applicable water quality standards

A Section 401 Water Quality Certificate and consistency concurrence with the State's Coastal Zone Management Program will be received from the State of New Jersey.

3. Potential Effects on Human Use Characteristics -

a. Municipal and private water supply - No effect

b. Recreational and commercial fisheries - Short-term effect during construction; there would be a temporary loss of benthic prey items in a small area within the nearshore zone and dredging area (1.5 acres). No restrictions to beach access for recreational purposes during construction. No restrictions of canal access during dredging.

c. Water related recreation - Short-term effect during construction due to localized elevated turbidity.

d. Aesthetics - Short-term adverse effects to noise sight and smell during construction are anticipated.

e. Parks, national and historic monuments, national seashores, wilderness areas, research sites and similar preserves – The dredging and fill placement is a beneficial use project that will not adversely impact any national sites.

G. **Determination of Cumulative Effects on the Aquatic Ecosystem**- Impacts on benthos and the aquatic ecosystem in general are considered to be temporary and do not represent a significant loss of habitat. This project, in concert with other existing or proposed similar actions, may produce measurable temporary cumulative impacts to benthic resources. However these impacts are short-term. The project provides a beneficial use of dredged material.

H. **Determination of Secondary Effects on the Aquatic Ecosystem** – Secondary impacts such as turbidity on aquatic organisms or temporary loss of food sources through the burial or removal of the benthos are considered to be of short duration.

III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

A. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation. No significant adaptation of the Section 404(b)(1) Guidelines were made relative to this evaluation.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site, Which Would Have Less Adverse Impact on the Aquatic Ecosystem. The alternative measures considered for accomplishing the project objectives present differing placement locations for beneficial use of dredged sand and would result in similar anticipated effects, as described in Section 5 of this Environmental Assessment. The No Action alternative would entail placement of

high quality sand in an upland confined disposal area and would not result in impacts to the proposed nearshore beneficial use placement site.

C. Compliance with Applicable State Water Quality Standards. This action is not expected to violate State of New Jersey Water Quality Standards. A Section 401 water quality certificate has been requested from the New Jersey Department of Environmental Protection and construction will not proceed until it is received.

D. Compliance with Applicable Toxic Effluent Standards or Prohibition Under Section 307 of the Clean Water Act. The proposed action is not expected to violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

E. Compliance with Endangered Species Act. The proposed action will comply with the Endangered Species Act of 1973 in accordance with the U.S. Fish and Wildlife Service's Biological Opinion issued in December 2005, and further Tier II consultation specific to the proposed plan prior to operations. Formal Section 7 coordination procedures have been completed with respect to the use of hopper dredges during June – November for the Lower Cape May Meadows – Cape May Point Environmental Restoration project and the potential effects on threatened and endangered sea turtles. Procedures with respect to the Biological Opinion (NMFS, 1996) and subsequent project-specific NLAA verification consultation will be followed to be in compliance with the Endangered Species Act.

F. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972. The proposed action will not violate the protective measures for any Marine Sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

G. Evaluation of Extent of Degradation of the Waters of the United States. The proposed action is not expected to result in permanent significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on life stages of aquatic life and other wildlife dependent on aquatic ecosystems; aquatic ecosystem diversity, productivity, and stability; and recreational, aesthetic, and economic values are not expected to occur or have long-term effects on impacted resources.

H. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem. Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems include placement of only high quality sand (>90%) and in small increments/load (300 cy). The material is not expected to be contaminated.

I. On the basis of the guidelines, the proposed placement sites evaluated as alternatives comply with the requirements of these guidelines, with the inclusion

of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.