

**FIRE ISLAND INLET TO MORICHES INLET  
FIRE ISLAND EMERGENCY STABILIZATION PROJECT**

**EVALUATION OF A PLAN FOR STORM DAMAGE REDUCTION**

**404(B)1 EVALUATION REPORT  
ATTACHMENT F TO THE  
FINAL ENVIRONMENTAL ASSESSMENT**

**U.S. Army Corps of Engineers  
New York District**

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**ATTACHMENT F**  
404(B) (1) EVALUATION REPORT

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STABLIZATION PROJECT

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## **1.0 PROJECT DESCRIPTION**

The effect of Hurricane Sandy on the study area and Congress's subsequent Disaster Relief Appropriates bill has increased the urgency to implement coastal storm risk management measures within the study area.

The proposed project consists of stabilization measures focused on the Fire Island to Moriches Inlet (FIMI) section of Fire Island. The proposed FIMI consists of beach nourishment/beach fill and dune creation along a 19 mile stretch of the barrier island from Fire Island Inlet to Moriches Inlet. Plans illustrating the locations of proposed fill are included as Attachment A to the Environmental Assessment (EA).

### **1.1 Study Area**

The FIMI study area includes Fire Island which extends approximately 31 miles east from Fire Island Inlet to Moriches Inlet. Fire Island Inlet and Moriches Inlet are Federal navigation channels that connect the ocean and the bays. Beaches along the barrier island chain are generally characterized by a well-defined dune system with crest elevations ranging from +6 to +40 feet relative to the National Geodetic Vertical Datum (NGVD). Beach berm widths vary, ranging from approximately 0 feet to 150 feet, with average beach berm elevations of approximately +6 to +10 feet NGVD.

The FIMI Stabilization Project area includes portions of the Towns of Babylon, Islip and Brookhaven, as well as two incorporated Villages, and the entirety of Fire Island National Seashore (FIIS).

### **1.2 Study Authority**

The Fire Island Inlet to Montauk Point, New York, Combined Beach Erosion Control and Hurricane Protection Project was originally authorized by the River and Harbor Act of 14 July 1960, and subsequently modified in accordance with Section 103 of the River and Harbor Act of 12 October 1962, Section 31 of the Water Resources Development Act (WRDA) of 1974, and Sections 103, 502, and 934 of the WRDA of 1986 (P.L. 99-662).

The authorized project provides for beach erosion control and hurricane protection along five reaches of the Atlantic Coast of New York from Fire Island Inlet to Montauk Point. Most construction of the authorized plan performed since the 1960's have occurred from Moriches Inlet to Shinnecock Inlet. After several iterations of proceeding with and stopping construction or restudy since 1965, the New York District (District) resumed the efforts of the Reformulation Study in 1994. The District, as requested by Congressional and local interests, was charged to evaluate the feasibility of interim projects which could be implemented immediately following Hurricane Sandy in October 2012. The FIMI Stabilization Project addresses the Fire Island to Moriches Inlet portion of the overall FIMP project area as a one-time, stand-alone project and does not pre-suppose the outcome of the overall FIMP reformulation

This report is being prepared in response to Public Law (PL) 113-2 of January 29, 2013, Disaster Relief Appropriations Act in response to Hurricane Sandy.

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1 Public Law (P.L.) 113-2, January 29, 2013.

### 1.3 General Description of Fill Material

#### General Characteristics of Material:

The inner continental shelf south and offshore of the Study Area is characterized by ridge and swale morphology. Surficial sediments are predominantly fine to medium grained sands. Fine-grained sediment outcrops exist in isolated areas of the inner shelf and shoreface. The geology of this area is complex and is characterized by Holocene sediments of variable thickness. These sediments generally consist of either organic-rich muds (backbarrier deposits typically found in the sheltered waters leeward of a barrier island) or modern marine and inlet-filling sands. The area west of Moriches Inlet is typified by a seaward-sloping wedge-shaped deposit of backbarrier sediments underlying marine sand. The maximum thickness of these Holocene sediments is 10 feet along the western portion of Fire Island. This sedimentary layer thins towards Moriches Inlet.

Along the FIMP Study Area the grain size distribution of the beach material varies. Typically, grain size increases from west to east, with mean grain size of 0.39 mm at Robert Moses State Park to 0.52 mm at Montauk Point.

#### Quantity of Material:

The total initial project fill volume is the sum of the design fill, advance fill, and overfill and contingency. The total initial fill volume for the initial construction increment is estimated at approximately 6,992,145 cubic yards (cy).

#### Source of Materials:

Borrow area 2C is located approximately 2 miles offshore of Point O' Woods and contains an estimated 9,000,000 cy of compatible sediment. In order to limit potential impacts to shoreface ridges containing modern Holocene sediments only the northeastern half of the borrow area will be dredged and utilized for the FIMI project. Sediment Suitability analyses were performed in 1998 and the texture of the material was found to be compatible with the native Fire Island sand (USACE 2014).

Borrow Area 4C area is located approximately 1.5 miles offshore of Pikes Beach and contains an estimated 2,000,000 cy of compatible sediment. However, after further investigation of the Sediment Suitability, it was found that only 700,000 cys (which reflects a 7' cut vs. a 20' cut) was found to be compatible with the native Fire Island sand.

Borrow Area 5B area is located approximately 6.5 miles offshore of Westhampton Beach and contains an estimated 9,500,000 cy of compatible sediment. Sediment Suitability analyses were performed in 1998 and the texture of the material was also found to be compatible with the native Fire Island sand.

### 1.4 General Description of Proposed Sites

#### Location:

The Fire Island to Moriches Inlet project, as mentioned above, includes initial beachfill placement along Fire Island. The selected plan includes beachfill at Robert Moses State Park, Fire Island Lighthouse Tract, and all of the communities outside of Federal Tracts, and Smith Point County Park.

#### Size:

The beach fill project is approximately 19 miles from Fire Island Inlet east to Moriches Inlet.

Description of Beachfill Methods:

The sand would be moved through a hydraulic pipeline that would extend from the dredging site across the inlet and nearshore area.

Types of Sites/Habitats:

The study area habitats include: offshore, ocean shoreline (nearshore, intertidal, beach, dune), inlets, barrier island (maritime forest, bayside beach, and terrestrial upland), back bay (intertidal, shoals/mudflats, tidal marsh, subtidal, submerged aquatic vegetation), and mainland upland. Of these, only nearshore and intertidal habitats are both regulated under the Clean Water Act Section 404 program and will receive fill placement.

Waters in the vicinity of the study area are class SA saline surface waters as designated by the New York State Department of Environmental Conservation (NYSDEC). This classification permits fishing and secondary recreational contact and shellfishing for marketing purposes.

Proposed Time and Duration of Construction:The proposed construction schedule below can be referenced to the attachments for construction dates in specific areas (MB-1A, GSB-1B, etc.):

Smith Point County Park

- Contract 1: Smith Point County Park (MB-1A, MB-1B, MB-2A): Contract 1: September 2014 to March 2015

Robert Moses Area

- Contract 2: Lonelyville to Robert Moses State Park (GSB-1A, GSB-1B, GSB-2A): November 2014 to March 2015

Communities

- Contract 3: Davis Park to Town Beach (GSB-2B, GSB-2C, GSB-2D, GSB-3A, GSB-3C, GSB-3E, GSB-3G): Contract 3: December 2014 to August 2015

## **2.0 FACTUAL DETERMINATION**

### **2.1 Physical Substrate Determination**

The borrow areas have been selected based on suitability of the available material for beach nourishment and dune creation. The material has been deemed compatible with the native Fire Island sand.

### **2.2 Water Circulation, Fluctuation, and Salinity Determinations**

#### Water:

*Salinity*- Not Applicable

*Water Chemistry*- No major impacts expected

*Clarity*-Temporary increases in turbidity will occur in the offshore borrow areas during hydraulic dredging and in the nearshore and intertidal areas during placement of sand on beaches. Minor impacts are expected since there is natural turbidity in the along shore zone. Impacts will be limited in spatial extent and duration.

*Color*- No major impacts are expected

*Odor*- No measurable odors are expected

*Taste*- Not applicable

*Dissolved Gas Levels*- Possible short-term variations may occur due to turbulence caused by dredging operations.

*Nutrients*-Potential short-term increase, but no long-term effects are expected.

*Eutrophication*- Not applicable

*Other*- Not applicable

#### Current Pattern and Circulation:

*Current Pattern and Flow*- Sediment transport at the placement areas is dominated by wave driven, long shore currents which tend to move sediment over much of the project length; this would continue.

*Velocity*- No changes are expected due to fill placement operations.

*Stratification*- Not applicable

#### Normal Water Level Fluctuations:

The project will shift the high-water line offshore from its present location, but will not alter the water level or tidal range.

Salinity Gradients:

Not Applicable

Actions Taken to Minimize Impacts:

Fill locations, areas, profiles and quantities are the minimum necessary to provide the desired level of coastal storm risk management.

**2.3** Suspended Particulate/Turbidity Determination

Expected Changes in Suspended Particles and Turbidity Levels in Vicinity of Disposal

Site(s):

Temporary increases in turbidity due to hydraulic pumping are expected. However, the existing environment at the placement area is turbid, and therefore, any increase in turbidity will not be noticeable and would be short term and should not extend much beyond the placement area.

Effects on Chemical and Physical Properties of the Water Column:

*Light Penetration* - Particles will settle fairly rapidly. Minor short term impacts are anticipated.

*Dissolved Oxygen* - Possible short-term reduction at the borrow areas.

*Toxic Metals and Organics* - No toxic metals or organic compounds are anticipated to be encountered.

*Pathogens* - Not applicable.

*Aesthetics* - Temporary short-term increase in turbidity are expected, but the water is naturally turbid at the sand placement areas.

*Others* - Not applicable.

Effects on Biota:

*Primary Production, Photosynthesis* - Minor short-term impacts at the borrow areas are anticipated. No significant impacts are expected.

*Suspension/Filter Feeders* - Minor short-term impacts are anticipated. Non-motile forms at placement site would be buried, but would recolonize shortly. At the borrow site, recolonization is also expected.

*Sight Feeders* - Fishes and motile invertebrates generally can avoid or leave areas where dredging and fill placement are being conducted. No significant impacts are expected.

### Actions taken to Minimize Impacts:

The depth of borrow area excavation is being limited to avoid deep stratified pits. Dredging and material placement in the nearshore and intertidal zones will be staggered over the proposed 15 month construction schedule, thereby affording opportunity for biota to re-establish gradually over the length of the project area.

#### **2.4 Contamination Determination**

All beach fill placed must have a sand content of 90% or greater, with any object (rock, rubble, debris) greater than .75 inches in diameter being held back by the discharge end screening device and disposed of.

With respect to other water quality concerns, since sediments beneath navigable waters proposed for dredging are considered as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action or if they are part of the National Priority List (NPL) site under CERCLA, no preliminary assessment for HTRW at the borrow area was necessary.

Sand from the borrow area is predominantly sand and gravel mixtures (> 90%); as such, it lacks affinity for binding of contaminants. The extremely low organic carbon and clay content of the borrow area sediments makes the presences of contaminants, at other than trace levels, extremely unlikely. Silicon particles are believed to have no substantial chemical attraction to heavy metals and organics, and under ocean disposal testing guidance "Green Book" - USACOE & EPA, 1991, it is assumed to be contaminant free and therefore, testing of the sediments has not been done.

Also, the borrow area is geographically removed from the direct influence of any known point source of contaminants and from any historical disposal area.

#### **2.5 Aquatic Ecosystem and Organism Determination**

##### Effects on Plankton

No major impacts are anticipated as the dredging area is comparatively small and only minor short term localized increases in turbidity are expected.

##### Effects on Nekton

No major impacts are anticipated as the dredging area is comparatively small and only minor short term localized increases in turbidity are expected.



### Effects on Benthos

Benthos in the borrow area are likely to experience direct mortality, unless they can vacate the area. Likewise, non-motile benthic species at the placement site would be buried.

### Effects on Aquatic Food Web

Long-term effects are not anticipated as the benthic communities are expected to re-establish within a relatively short time period.

### Effects on Special Aquatic Sites:

*Sanctuaries and Refuges* - Not applicable

*Wetlands* - Not applicable – no fill material will be placed in vegetated wetlands

*Mud Flat* - Not applicable.

*Vegetated Shallows* - Not applicable

*Coral Reefs* - Not applicable

*Riffle and Pool Complexes* -Not applicable

### Threatened and Endangered Species:

The proposed project has the potential to adversely affect two federally listed threatened species: piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). The USACE has prepared a Biological Assessment (BA) that describes the potential direct and indirect impacts on these two species. Coordination is and appropriate measures will be incorporated to ensure that the project is implemented in such a way as to minimize adverse impacts to these species and comply with the Endangered Species Act.

Roseate terns (*Sterna dougallii*; endangered), are also likely to be seasonally present in the project area. As detailed in the EA, the overall impact of the FIMI TSP on roseate tern is unclear.

No adverse impacts to occasionally occurring transient federally listed sea turtles or marine mammals are expected.

Additional state listed species may also be present in the project area. The EA provides an assessment of potential project impact on these species; however, no significant impacts were identified.

Other Wildlife:

Adverse impacts to other terrestrial wildlife are not anticipated; these species will avoid the sand placement area during construction and will benefit in the long term from the created beach and dune habitat and stabilized conditions on the barrier island.

Actions to Minimize Impacts:

The placement of sand would be controlled and scheduled to prevent interference with bird breeding and nesting seasons.

**2.6 Proposed Beachfill Site Determination**

Mixing Zone Determination:

Because of the short-term duration of the effects and the existing water depth in the sand placement area, the vertical and horizontal mixing zones are negligible.

Determination of Compliance with Applicable Water Quality Standards:

The NYS DEC classifies waters in the study area as SA, saline surface waters. State water quality standards are not expected to be exceeded by the proposed FIMI Stabilization Project.

Potential Effects on Human Characteristic:

*Municipal and Private Water Supply* - Not applicable.

*Recreational and Commercial Fisheries* – Work would be in sections to minimize impacts to recreation and swimming. Minimal adverse impacts to sport fishery are expected; these impacts would be short term and limited to the construction period.

*Water-Related Recreation* - New and additional recreational opportunities are expected due to expanded beach areas.

*Aesthetics* - The beach would be returned to a width which is generally considered to be aesthetically pleasing. *Parks, National and Historical National Seashores, Wilderness Research Sites, and Similar Preserves* - No adverse effects are expected; the project will provide erosion protection to these areas.

## **2.7** Determination of Cumulative Effects on the Ecosystem

The cumulative effect of the proposed discharge would be to reduce storm damage by restoring a functional beach berm and dune system. In so doing, historical littoral drift patterns will be recreated. The proposed project would protect the shores from beach erosion with no serious disadvantage to water quality or the aquatic ecosystem. Impacts associated with hydraulic dredging and placement are anticipated to be short-term. The Reformulation Study for the overall authorized Atlantic Coast of Long Island, Fire Island Inlet to Montauk Point, New York Federal Beach Erosion and Hurricane Protection Project will address cumulative impacts for the 83-mile study area.

## **2.8** Determination of Secondary Effects on the Ecosystem

The potential secondary impacts of the proposed placement activity include impacts resulting from dredging the proposed offshore borrow areas. Potential impacts include changes in bathymetry, sediment type, water circulation and current patterns, turbidity, benthos and epibenthos community characteristics. Borrow area design has incorporated these concerns to minimize physical and biological impacts. The proposed limit on dredging depth (maximum 20-feet) would limit changes in bathymetry to minimize possible circulation and sedimentation impacts. Borrow area benthic populations are expected to reestablish fairly quickly.

Increase in recreational use of the shoreline would be another secondary impact, but the existing infrastructure is adequate to accommodate the increased activity without any significant adverse effects.

### **3.0 FINDING OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE**

- No significant adaptations of the guidelines were made relative to this evaluation
- Two to the alleviation of the coastal storm risk management problem in the study area were considered. There are no practicable alternatives under the jurisdiction of Section 404 (b) (1) guidelines.
- The proposed action would not cause violations of applicable state water quality standards or effluent standards.
- The proposed dredged material placement would not cause violations of the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- Presently, formal coordination with the USFWS-LIFO under Section 7 of the Endangered Species Act of 1973, to insure the safety of piping plover and seabeach amaranth populations that are present. Formal consultation with the NMFS regarding the protection of the four threatened and endangered sea turtles and three endangered whales is completed.
- The proposal would have no impact on marine sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.
- The proposed discharge of dredged material would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on aquatic ecosystem diversity, productivity and stability are not expected. Impacts to recreational, aesthetic and economic values will be for the most part beneficial.
- Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems include good engineering practices and the use of dredged material which is compatible with the sediments on the receiving shores.
- On the basis of the guidelines, the proposed discharge site for dredged or fill material is specified as complying with the requirements of these guidelines.