Leonardo
Raritan Bay and Sandy Hook Bay, New Jersey
Coastal Storm Risk Management
Feasibility Study

Draft Environmental Assessment

March 2015

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

The U.S. Army Corps of Engineers, New York District proposes to implement the Leonardo, Raritan Bay and Sandy Hook Bay, New Jersey Coastal Storm Risk Management Project within Middletown Township, Monmouth County, New Jersey. The project involves the elevation and flood proofing of up to 25 structures.

Structural alternatives considered include various combinations of beach and or dune fill (with and without terminal groin), levees, floodwalls, closure gates, seawalls, and road rising. Nonstructural alternatives considered were buyout, relocation, site restoration, building elevation, building protective ring walls or berms, various types of dry flood proofing (direct treatment of affected buildings), and wet flood-proofing (protecting the integrity of certain buildings while allowing basements to flood).

Results of the analysis, large and small-scale structural and widespread non-structural alternatives do not warrant federal interest. Federal interest is warranted in the development of limited non-structural alternatives and is supported by the non-federal sponsor, the New Jersey Department of Environmental Protection.

In addition to meeting Benefit-Cost Ratio requirements, selection of this non-structural alternative eliminates all major negative environmental impacts. No wetlands will be affected nor will any other habitat be destroyed, since building elevation utilizes the same existing footprint and floodwaters will essentially be allowed to flow as they would under the no action (no protection of any kind) alternative. Since levees, floodwalls or any other structure would not be built, impacts to aquatic, wetland and upland habitat would be eliminated. For the same reasons, and because no historic buildings are included in the project, there will be no impact to cultural resources. Any other impacts, including the environmental impacts associated with building elevation, will be minor and temporary (e.g., temporary relocation of residents during construction). All federal, state, and local laws (including OSHA and CERCLA) and regulations will be followed for construction procedures including transport of debris, proper disposal of materials and environmental protection of the project area during the entire construction period.

Based on my review and evaluation of the environmental effects as presented in the environmental assessment, I have determined that the proposed project is not a major federal action significantly affecting the quality of the human environment. I have reviewed the proposed action in terms of overall public interest and found that the proposed action does not warrant the preparation of an Environmental Impact Statement (EIS).

_____

Paul E. Owen
Colonel, US Army
District Engineer

_____

Date

Table of Contents

List of Figures

List of Tables

Appendices

1.0 Purpose and Need of Action

The community of Leonardo located within Middletown Township in Monmouth County, New Jersey. Because of its location and topography, Leonardo is subject to recurrent flooding from the bay and associated tidal creeks. Damages from the recurrent flooding, as well as shore erosion and wave attack, threaten the resiliency of this bayshore community.

1.1 Background

The U.S. Army Corps of Engineers (USACE) North Atlantic Division (NAD), New York District (CENAN) prepared this draft Environmental Assessment (EA) for the Leonardo, Raritan Bay and Sandy Hook Bay, New Jersey Coastal Storm Risk Management Feasibility Study (Leonardo study). It includes input from the non-Federal study sponsor, local governments, natural resource agencies, non-governmental organizations, and the public.

1.2 Study Authorization

The Leonardo study was authorized by a resolution of the Committee on Public Works and Transportation of the U.S. House of Representatives adopted August 1, 1990:

> *Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Board of Engineers for Rivers and Harbors is requested to review the report of the Chief of Engineers on Raritan Bay and Sandy Hook Bay, New Jersey, published as House Document No. 464, Eighty-seventh Congress, Second Session, and other pertinent reports, to determine the advisability of modifications to the recommendations contained therein to provide erosion control and storm damage prevention for the Raritan Bay and Sandy Hook Bay.*

This study authority covered the Raritan Bay and Sandy Hook Bay area, from South Amboy at the entrance to the Raritan River at the western end to Highlands at the eastern end. In response to the study authority, the Raritan Bay and Sandy Hook Bay, New Jersey Combined Hurricane Storm Damage Reduction and Shore Protection Reconnaissance Study Report (1993) concluded that within the study area shoreline protection and flood control projects in Leonardo and five other communities appeared to be economically viable and were recommended for further investigation.

Leonardo and the other identified communities could proceed to interim feasibility studies after a pre-feasibility study was conducted. These studies were to demonstrate the extent of Federal interest in a considered site-specific plan and to provide a better basis for estimating the feasibility phase cost. The pre-feasibility study for Leonardo (1999) identified a potential plan that appeared economically and environmentally feasible. The Feasibility Cost Sharing Agreement (FCSA) with the New Jersey Department of Environmental Protection (NJDEP) for Leonardo was executed in 1999.

Prior to Hurricane Sandy, the Leonardo study was close to completion. The Leonardo study was included in Interim Report 2 in response to the Hurricane Sandy Disaster Relief Appropriations Act (P.L. 113-2), as a project under study to receive $1 million to complete the feasibility study. A

FCSA amendment for $1 million to complete the feasibility study was executed on 23 August 2013.

1.3 Project Area Description

The study area is the area within which project impacts may occur. The study area and its existing conditions are described in this section. The bayshore of the study area is approximately 6,500 ft long.

The Study area is located in Middletown Township, NJ, within the Raritan Bay and Sandy Hook Bay greater study area (Figure 1). Leonardo occupies a 0.5 square mile area of land, along the coast of Sandy Hook Bay, dominated by a +39 feet NAVD88 small knoll. The study area is defined by the Sandy Hook Bay to the north, Wagner Creek to the east, New Jersey State Route 36 to the south, and the U.S. Naval Weapons Station Earle to the west near Ware Creek. All creeks in the Study area flow north into Sandy Hook Bay.

The project area is the area in which measures will likely be built. Because the Tentatively Selected Plan is nonstructural, it encompasses the study area. A more detailed view of the study and project area is presented in Figure 2.

1.4 National Environmental Policy Act Requirements

This EA was prepared pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) Guidance Regarding NEPA Regulations, and the USACE's Procedures for Implementing NEPA (Engineering Regulation [ER]-200-2-2).

An EA is a concise public document prepared by the Federal agency to determine whether the proposed action has the potential to cause significant environmental effects (40 Code of Federal Regulations (CFR) 1508.9(a)). The purposes of an EA are to:

- provide evidence and analysis sufficient to determine whether an Environmental Impact Statement (EIS) is required;
- aid a federal agency's compliance with NEPA when no EIS is necessary;
- facilitate preparation of an EIS when one is necessary; and
- serve as the basis to justify a finding of no significant impact (FONSI).

The EA must discuss:

- the need for the proposed action;
- the proposed action and alternatives;
- the probable environmental impacts of the proposed action and alternatives; and the agencies and persons consulted during preparation of the EA.

NEPA requires federal agencies to integrate the environmental review into their planning and decision-making process. This integrated report is consistent with NEPA statutory requirements. The report reflects an integrated planning process, which avoids, minimizes, and mitigates adverse project effects associated with flood damage reduction actions.

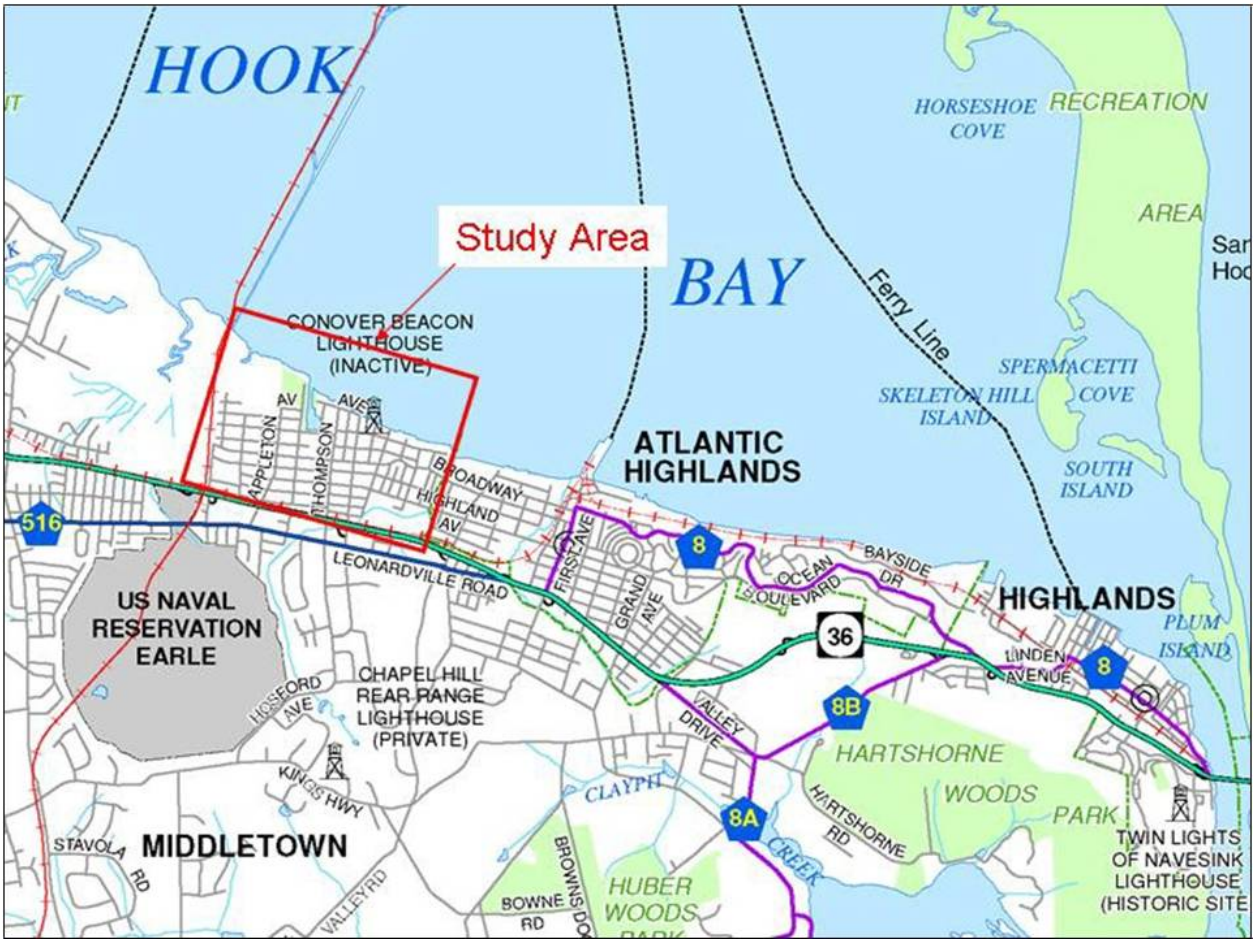

Figure 1: Study Area for Leonardo, NJ

Source: NJOIT, OGIS, New Jersey 2007 - 2008 High Resolution Orthophotography; NJDOT, Roads 2008

Figure 2: Project Area for Leonardo, NJ

2.0 Proposed Action and Alternatives

A total of twelve alternatives, including the No Action alternative, were considered. Of these, six were structural alternatives and five were nonstructural alternatives. The six structural alternatives were:

- Alternative S1 – Seawall with gate across the marina.
- Alternative S2 – Beach Fill with gate across the marina.
- Alternative S3 – Combination Beach Fill and Seawall with gate across the marina.
- Alternative S4 – Combination Beach Fill and Seawall with gate across the marina, coastal storm risk management provided only west of Brevent Avenue.
- Alternative S5 – Limited structural plan with no gate across the marina.
- Alternative S6 – Road raising.

Each of the six structural plans consisted of an alignment that would reduce storm inundation in low-lying developed areas. Beach fill and seawalls or both represent the most feasible alternatives to provide structural coastal storm risk management for Leonardo. Structural Plans S1 through S5 also require interior drainage improvements to avoid trapping runoff behind the alignment. For these alternatives, it was assumed that a series of small storm water pumps would meet the interior drainage needs. Alternatives S1-S4 also include flood proofing or elevating structures that lie outside of the alignment.

The five nonstructural alternatives, which assumed elevation of structures for a one percent flood (with the exception of N4), were:

- Alternative N1 – Structures in the 20 percent floodplain.
- Alternative N2 – Structures in the 4 percent floodplain.
- Alternative N3 – Structures in the 1 percent floodplain.
- Alternative N4 – Structures in the 20 percent floodplain, elevated to the level of a 10 percent flood.
- Alternative N5 – Structures with a main floor at or below +9.4 feet NAVD88 and ground elevation below +7.9 ft NAVD88

Alternatives N1 to N3 are variants of a general strategy to elevate buildings out of the one percent floodplain. The pool of buildings selected for treatment against the one percent flood is based on the frequency with which the buildings are affected by tidal inundation. The intent of Alternative N4 is to examine whether reduction of flood damages is more cost effective than elevating the structures out of the floodplain. Alternative 5 represents a different approach to forming the pool of structures, using the elevation of the main floor within the structures rather the associated ground elevation.

The 12 alternatives, including the No Action Alternative, are described below. For more detailed descriptions and figures, see the Feasibility Report and appendices.

2.1 No Action Alternative

This plan includes additional federal actions taken to provide for coastal storm risk management, namely, grants from the Federal Emergency Management Agency (FEMA) to support disaster recovery for homeowners and businesses. This plan fails to meet the USACE study objectives or needs for the majority of the project area. However, it provides the baseline against which project benefits are measured. The period of analysis is 2017-2067.

2.2 Structural Alternatives

All of the structural alternatives were developed to the one percent flood.

Alternative S1: Seawall

Alternative S1 would manage risk to t the entire area from the Weapons Station Pier, in the vicinity of Cedar Avenue to Wagner Creek with levees, floodwalls, closure gates, seawalls, a road raising, and by implementation of a nonstructural component. The main feature would be a long seawall extending from the state marina to Wagner Creek.

The alignment would start from high ground near Florence Avenue running east along the coast and tying back into high ground near Wagner Creek. The alignment would be made up of approximately 100 feet of levee, 2,100 feet of floodwall, 3.800 feet of seawall, and three closure gates, including two 30' x 8' vehicular swing gates allowing access to the end of Concord Avenue and to the marina boat ramp, and a 45-foot wide buoyant swing gate structure at the marina entrance. The fourth 40-foot wide by 5-foot high swing gate would allow access to the boatyard at Wagner Creek.

Four small below-grade pump chambers (50 CFS each) would collect and discharge any interior runoff from each of four sub-drainage basins behind the alignment. In addition, this alternative would include rising of the road at the intersection of Ocean Boulevard and Burlington Avenue by approximately 400 feet and would include elevating (flood proofing) approximately 50 buildings in the one percent floodplain that would not be included by the structural alignment.

Alternative S2: Beach Fill

Similar to Alternative S1, Alternative S2 would manage risk to the entire area from the Weapons Station Pier in the vicinity of Cedar Avenue to Wagner Creek with beach fill, a levee, a floodwall, a seawall, a road raising, three closure gates, and a nonstructural component. The main feature would be the beach and dune segment.

The alignment would start from high ground near Florence Avenue running east along the coast and tying back into high ground near Wagner Creek. The components would include 100 feet of levee, 2,100 feet of concrete-encased steel sheet pile floodwall, 400 feet of seawall, 3,450 feet of beach and dune, and two 600-foot stone groins. Two 30' x 8' vehicular swing gates would allow for access to the end of Concord Avenue and to the marina boat ramp, and a 45-foot wide buoyant swing gate structure would cross the marina entrance.

Four small below-grade pump chambers (50 CFS each) would collect and discharge any interior runoff from each of four sub-drainage basins behind the alignment. In addition, this alternative

would include rising the road at the intersection of Ocean Boulevard and Burlington Avenue by approximately 400 feet and would include elevating (flood proofing) approximately 50 buildings in the one percent floodplain that would not be included by the structural alignment.

Alternative S3: Beach Fill and Seawall to Brevent Avenue
Alternative S3 would combine elements of alternatives S1 and S2 into a plan that would include both beach fill and seawall components. The extent of the alignment would be the same as for Alternatives S1 and S2 and include levees, floodwalls, seawalls, protective beaches, a dune with a terminal groin, four closure gates, road raising, and a non- structural component.

The alignment would start from high ground near Florence Avenue running east along the coast and tying back into high ground near Wagner Creek. The components would include 100 feet of levee, 2,100 feet of concrete-encased steel sheet pile floodwall, 2,700 feet of seawall, 1,150 feet of beach and dune, and a 600-foot stone groin. Two 30' x 8' vehicular swing gates would allow for access to the end of Concord Avenue and to the marina boat ramp, and a 45-foot wide buoyant swing gate structure would cross the marina entrance. The alignment would end at the boatyard near Wagner Creek and include a 40-foot wide by 5-foot high swing gate for boatyard access.

Four small below-grade pump chambers (50 CFS each) would collect and discharge any interior runoff from each of four sub-drainage basins behind the alignment. In addition, this alternative would include rising of road at the intersection of Ocean Boulevard and Burlington Avenue by approximately 400 feet and would include elevating (flood proofing) approximately 50 buildings in the one percent floodplain that would not be included by the structural alignment.

Alternative S4: Beach Fill and Seawall to Brevent Avenue
Alternative S4 would be similar to Alternative S3 but would not cover the area from Brevent Avenue to Wagner Creek, a distance of approximately 1,700 feet. This alternative would include construction of levees, floodwalls, and seawalls, a protective beach, and dune with terminal groins, road rising, and a nonstructural component. The western limit of the alignment would be at Florence Avenue near Ridgewood Avenue. The eastern limit of the alignment would tie into Brevent Avenue.

Similar to the previous alternatives, the alignment would start with a 100-foot earthen levee. The alignment would include 2,250 feet of concrete-encased steel sheet pile floodwall, 400 feet of seawall, and a beach and dune segment spanning 1,150 feet ending at a 600-foot long terminal stone groin. Two 30' x 8' vehicular swing gates would allow for access to the end of Concord Avenue and to the marina boat ramp, and a 45-foot wide buoyant swing gate structure would be located at the marina entrance.

Three small below-grade pump chambers (50 CFS each) would collect and discharge any interior runoff from each of four sub-drainage basins behind the alignment. In addition, this alternative would include approximately 400 feet of road rising at the intersection of Ocean Boulevard and

Burlington Avenue and would include elevating (flood proofing) approximately 30 buildings in the one percent floodplain that would not be included by the structural alignment.

Alternative S5: Limited Structural Plan
Alternative S5, with similar beach and dune fill and seawall as Alternative S4, includes an alignment from the area from the east side of the state marina to Brevent Avenue. This would include construction of a floodwall, beach, and seawall. The western limit of the alignment would be at Concord Avenue. The eastern limit of the alignment would tie into the north end of Brevent Avenue.

The shore alignment consists of 400 feet of stone seawall, followed by 1,150 feet of beach and dune, terminating at a 600-foot stone groin. The remaining alignment includes 900 feet of seawall to Brevent Avenue. The western tieback to high ground would consist of a 1,300 feet of concrete-encased steel sheetpile floodwall, terminating at a tie-off levee. Swing closure gates would provide access through the floodwall to the marina and parking lots. Two small below-grade pump chambers (50 CFS each) would collect and discharge any interior runoff from the sub-drainage basins behind the alignment.

Alternative S6: Limited Road Raising
This alternative would consist solely of raising the intersection of Ocean Boulevard and Burlington Avenue, for approximately 400 feet of roadway. This would prevent higher storm surges from entering low-lying areas landward of the Ocean Boulevard intersection with Burlington Avenue, while providing for the free flow of traffic at all times. Interior runoff trapped by the raised road would drain out through drop inlets connected to a drainpipe fitted with a flap gate. It was subsequently determined that the flooding problem addressed by this alternative was related to interior drainage rather than costal storms. S6 was not carried further but is included in this discussion to document the study history.

2.3 Nonstructural Alternatives

In general, all structures (except those included in plan N4) that required flood proofing in each floodplain were treated to one foot above the one percent flood in accordance with FEMA guidelines. Flood proofing and other nonstructural alternatives were only evaluated for residential structures. Residential buildings within the floodplains that already meet the design elevation requirements were excluded from the plans.

Alternative N1
Alternative N1 is a nonstructural plan for structures in the 20 percent floodplain where structures have a 20% chance of flooding in any given year. The 20 percent floodplain includes all structures that have ground elevations below +6.9 ft NAVD88. The structures would be elevated to the design elevation of +13.1 ft NAVD88 was used, which consisted of the one percent flood stillwater elevation in 2009 (+10.7 ft NAVD88) plus the historic sea level rise (.7 ft) plus 50% of the wave setup contribution (0.7 ft – the same for each structure in nonstructural alternatives) plus 1 ft of freeboard. Preliminary assessments indicated that 23 elevations would be required.

Alternative N2
Alternative N2 is a nonstructural plan for structures in the four percent floodplain where structures have a 4% chance of flooding in any given year. The four percent floodplain includes all structures that have ground elevations below +9.4 ft NAVD88. The structures would be elevated to the design elevation of +13.1 ft NAVD88 was used, which consisted of the one percent flood stillwater elevation in 2009 (+10.7 ft NAVD88) plus the historic sea level rise (.7 ft) plus 50% of the wave setup contribution (0.7 ft – the same for each structure in nonstructural alternatives) plus 1 ft of freeboard. Preliminary assessments indicated that 99 elevations would be required.

Alternative N3
Alternative N3 is a nonstructural plan for structures in the one percent floodplain where structures have a 1% chance of flooding in any given year. The one percent floodplain includes all structures that have ground elevations below +11.4 ft NAVD88. The structures would be elevated to the design elevation of +13.1 ft NAVD88 was used, which consisted of the one percent flood stillwater elevation in 2009 (+10.7 ft NAVD88) plus the historic sea level rise (0.7 ft) plus 50% of the wave setup contribution (0.7 ft – the same for each structure in nonstructural alternatives) plus 1 ft of freeboard. Preliminary assessments indicated that 160 elevations would be required.

Alternative N4
Alternative N4 is a nonstructural plan. Similar to Alternative N1, Alternative N4 manages risk to structures within the 20 percent floodplain. However, Alternative N4 has evaluated a lower level of flood risk management for structures in the 20 percent floodplain. Instead of treating individual structures to the one percent design elevation (as was the case for Alternatives N1, N2 and N3), this alternative (N4) would only provide coastal storm risk management to the 10 percent flood design elevation (+9.9 ft NAVD88). This alternative was developed to determine if nonstructural treatments to a lower level of performance would be more cost effective than treatment to bring these structures to a minimum of the one percent flood design elevation. It is important to note that even if the lower level of performance were more cost effective, such an alternative would carry high residual risks for the structures involved and would not be implementable as local building codes requiring elevation to one ft above base flood elevation would not be met. Preliminary assessments indicated that 18 elevations would be required.

Alternative N5
Alternatives N1 through N4 were developed based on the number of structures within a given floodplain. However, many structures in the study area have elevated main floors such that, while they may be located within an area that experiences frequent flooding, the structures themselves do not suffer significant recurring damages. Thus, an alternate approach was taken to identify structures for nonstructural treatment: structures were identified for nonstructural improvement by main floor elevation.

Alternative N5 is a nonstructural plan that includes treating structures with the main floor less than or equal to +9.4 ft NAVD88 (four percent flood). In order to identify those structures most

susceptible to damage, only those structures with a ground elevation less than +7.9 feet NAVD were considered. The structures included in this alternative would be elevated to manage risk against a one percent flood design elevation (+13.1 ft NAVD88). Structures with a main floor elevation above +9.4 ft NAVD88 would be expected to experience only limited damage up to the four percent flood. Preliminary assessments indicated that 25 elevations would be required.

Proposed Action

The Tentatively Selected Plan (TSP) provides for nonstructural treatment of up to 25 structures within the community of Leonardo to address damages from coastal storms (Figure 3). This number will undergo further refinement during plan optimization, which will result in between 10 to 25 structures to be recommended for treatment.

The recommended nonstructural treatment for the 25 structures is elevation of the structure out of the one percent floodplain, as determined by FEMA. After treatment, the final main floor elevation of elevated structures will range between +15.2 ft NAVD88 to +18.4 ft NAVD88, depending on the specific location of each structure. To achieve this height, structures will be raised anywhere between 1.8 ft to 10.6 ft from their existing elevations, dependent upon their current, individual main floor elevations.

The construction technique varies depending on the foundation type, which in Leonardo includes crawl space, slab on grade, and sub-grade basement. Existing basements would be filled in and compacted as part of the elevation of the structure and associated utilities. Slab on grade or crawl space structures would have their foundations extended into the ground for stability as part of elevation; the space between the elevated structure and ground surface may be enclosed or left open. Diagrams illustrating the construction technique for each foundation type can be found in the Engineering Appendix.

Due to the highly irregular nature of the floodplain in Leonardo, the selected structures are scattered throughout the study area. Although the study team considered comprehensive structural and nonstructural alternatives, they were not cost effective and were screened from further consideration

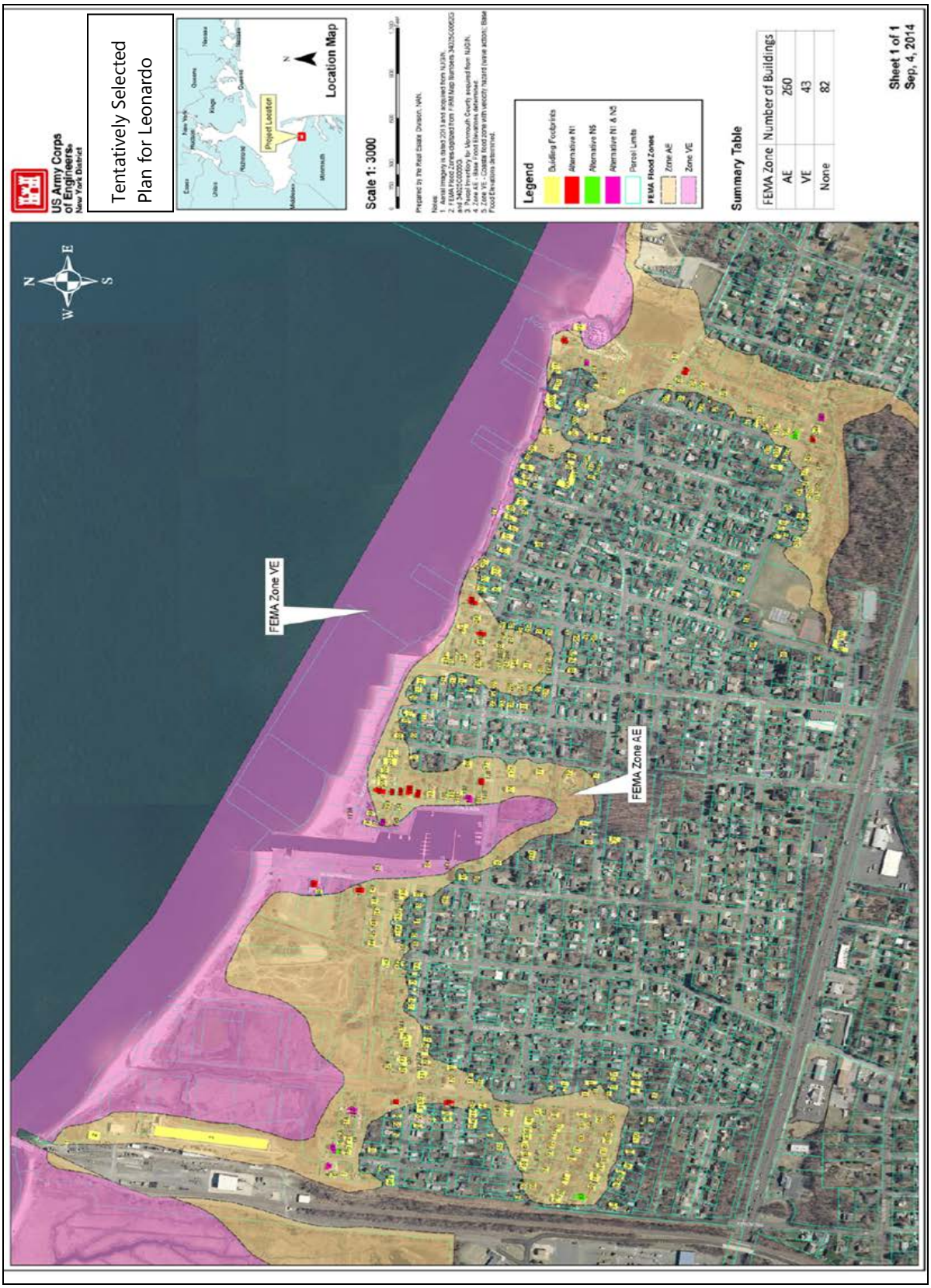

Figure3: Proposed Action/Tentatively Selected Plan for Leonardo, NJ.

3.0 Existing Environment

3.1 Water Resources

3.1.1 Groundwater

Leonardo is located directly above the New Jersey Coastal Plain Sole Source Aquifer System, which was designated under the authority of Section 1424(e) of the Safe Drinking Water Act (53 FR 23731, 1988). Sole Source Aquifer designation is one tool to protect drinking water supplies in areas with few or no alternative sources to the ground water resource, and where if contamination occurred, using an alternative source would be extremely expensive. The designation protects an area's ground water resource by requiring EPA to review all proposed projects within the designated area that will receive federal financial assistance.

The New Jersey Coastal Plain Aquifer System covers about 4,200 square miles. More than half of the land area is below an altitude of fifty feet (50') above sea level (NGVD). The area is largely surrounded by salty or brackish water and is bounded by the Delaware River on the west, Delaware Bay on the south, the Atlantic Ocean on the east, and Raritan Bay on the north.

The New Jersey Coastal Plain Aquifer discharges to the surface through streams, springs, and evapotranspiration. Many streams ultimately flow into bays or directly into the ocean. Development of the ground water reservoir as a water supply source constitutes another discharge component which today accounts for a significant portion of discharge from the overall system. In certain areas (e.g., along the Delaware River) heavy pumping has caused a reversal in the normal discharge from the aquifer (Raritan-Magothy) such that the surface stream (Delaware River) now recharges the aquifer. This phenomenon implies that, in addition to the New Jersey Coastal Plain Area, the Delaware River Basin within Delaware, New Jersey, Pennsylvania and New York must be regarded as a stream flow source zone (an upstream headwaters area which drains into a recharge zone), which flows into the Coastal Plain Area (USEPA 1988).

3.2 Surface Water

Leonardo is located in the Raritan and Sandy Hook Bay Complex, which is part of the Hudson-Estuary Complex. The project area is more specifically located within the Pews Creek to Shrewsbury River sub-watershed.

The Shrewsbury River is a wide tidal river surrounded by mostly residential development and separated from the Atlantic Ocean by developed barrier beaches. A few dredged material and salt marsh islands exist at the confluence of the river. Especially important are the many small tidal creeks entering Sandy Hook and Raritan Bays including, from east to west: Wagner Creek, Many Mind Creek, Ware Creek, Compton Creek, Pews Creek, East Creek, Flat Creek, Chingarora Creek, Matawan Creek, Whale Creek, Marquis Creek, and Cheesequake Creek (USFWS 1997).

The Pews Creek to Shrewsbury River sub-watershed is on the 2008 New Jersey List of Water Quality Limited Waters or the *303(d)* list. The sub-watershed is listed as having lower quality water that is not attaining one or more designated uses because it does not meet New Jersey

surface water quality standards and requires the development of Total Maximum Daily Loads (TMDLs) to meet those standards. The designated uses not attained at the Pews Creek to Shrewsbury sub-watershed are aquatic life (general), aquatic life (trout), fish consumption, and recreation uses. The pollutants causing non-attainment of the designated uses in the Pews Creek to Shrewsbury River sub-watershed are mercury, chlordane, PCB, DDT, DDD, and DDE; all are ranked as medium as their relative priority for TMDL development. All waters of Pews Creek and tributaries thereof are prohibited as shellfish growing waters (NJAC, 2008).

Four of the residential buildings considered in the proposed action flank Wagner Creek. At all locations the stream is visible water that appears as a natural stream course and is categorized as FW2-NT/SE1, meaning that the waterway has a salt water/freshwater interface and is a non-trout water (generally not suitable for trout because of physical, chemical or biological characteristics) (NJAC 2008).

3.3 Vegetation

3.3.1 Uplands

Upland plants are those typical in urban settings and include ornamental shrubs, grasses, and trees adjacent to houses.

3.3.2 Wetlands

The south shore of Raritan Bay - Sandy Hook Bay, from the confluence of the Shrewsbury and Navesink Rivers and Sandy Hook Bay in Highland, New Jersey, west to the mouth of the Raritan River, includes a narrow strip of bayshore marshes, creeks, beaches, dunes, and remnant forests. Intertidal and shallow subtidal mudflats and sandflats extend out an average of 1/4 mile offshore of these habitats. A total of 1,460 hectares (3,600 acres) of flats was mapped in the National Wetlands Inventory for this portion of shoreline. The salt marshes along this shoreline consist of high and low marsh cordgrass (*Spartina patens* and *Spartina alterniflora*) with lesser amounts of black grass (*Juncus gerardii*), marsh elder (*Iva frutescens*), and groundsel bush (*Baccharis halimifolia*) in the high tide zone, and common reed (*Phragmites australis*) is invasive in many places. The upland forests are composed primarily of oaks (*Quercus* spp.), black cherry *(Prunus serotina*), and tree-of-heaven *(Ailianthus altisima*), with an understory of mountain laurel (*Kalmia latifolia*) and arrowwood (*Viburnum* spp.) and lowland forests composed of cottonwood (*Populus heterophylla*) and sweet gum (*Liquidambar styraciflua*). These wetlands, uplands, and nearshore waters form a bayshore complex, which is critical for migratory and resident birds, and fish (USFWS 1997).

Most of the wetlands within Leonardo have been subjected to human-induced alterations, including soil removal; dredge spoil deposition, brick/asphalt/concrete waste fill, repeated burning, and ditching. Throughout the project area, development for residential and commercial uses has extended past the historic wetland/upland boundary and extensive development has occurred on fill material that has been placed in historic wetlands (USACE 2002).

Despite wetland losses and disturbance, a number of wetland communities remain in the project area. Approximately 19.5 acres of jurisdictional wetlands were delineated within the 390-acre survey area in 2001 (USACE 2002). Four vegetated wetlands communities were identified: estuarine intertidal emergent, estuarine intertidal emergent scrub/shrub, palustrine forest

broad-leaved deciduous, palustrine forest/scrub-shrub broad-leaved deciduous. The wetland communities are dominated by mono-specific stands of *P. australis* (8.2 acres) and palustrine forest/scrub-shrub (6.2 acres), which are dispersed throughout the northwest, central, and eastern sections of the project area. In addition, three non-jurisdictional wetland habitats covering approximately 22.6 acres (6%) of the project area were identified: estuarine subtidal open water, estuarine intertidal unconsolidated shore with sand substrate (i.e., beach), and estuarine intertidal unconsolidated bottom with mud substrate (i.e., mudflat) (USACE 2002).

Description of NJDEP wetland designations:
Saline marshes are coastal marshes. Coastal marshes are associated with the tidal portions of the Delaware River system and the tidal portions of the watercourses draining into the Atlantic Ocean. This cover type is predominantly vegetated by herbaceous plants adapted to the varied environmental conditions imposed by the tidal environment: water level fluctuations, salinity, and sediment deposition. Also included are those non-tidal areas closely associated with adjacent coastal wetlands such as salt marsh transition zones and coastal vegetated dunes.

Deciduous wooded wetlands are considered interior wetlands. Interior wetlands are generally found in non-tidal lowlands associated with primary, secondary and tertiary watercourses, and isolated wetlands. Included under this heading are all forested wetland (regardless of tidal influences) dominated by deciduous and coniferous trees, and non-tidal herbaceous marshes and savannas.

Description of wetland types from 2001 delineation:
Intertidal-emergent wetland types were the most common in the project area. They are represented by two distinct wetland communities in Leonardo, monotypic stands of *P. australis* and communities dominated by *S. patens*. These communities were most prevalent along ditches and low areas that are influenced by both tidal flow and sporadic freshwater runoff from residential areas. Wetland complexes in the northwest, central, and northeast sections of the project area represent typical mono-specific stands of *P. australis* found in Leonardo. These stands are approximately 75-90 percent dominated with *P. australis* and are very densely vegetated. However, relative to *P. australis* communities found elsewhere in New Jersey, *P. australis* in Leonardo is typically stunted with an average height of less than five feet. Tidal creeks, with saline input from Sandy Hook Bay, are the predominant source of hydrology into these communities. *P. australis* dominated communities become less dense, and less abundant as the distance from Sandy Hook Bay increases.

Intertidal Emergent/Scrub-Shrub are dominated by *P. australis* and groundsel tree (*Baccharis halimifolia*). In addition, these communities often have a minor vegetative component comprised of red maple (*Acer reubrum*) and sweetgum (*Liquidambar styraciflua*) saplings, multiflora rose (*Rosa rugosum*), Japanese honeysuckle (*Lonicera japonica*), and an herbaceous layer dominated by skunk cabbage (*Symplocarpus foetidus*). This community was typically found along the perimeter of mono-typic stands of *P. australis*, and along tidal ditches. This wetland type represents the transitional zone from a *P. australis* wetland to an adjacent upland community.

Forested/Scrub-Shrub broad-leaved deciduous. These wetland communities are located primarily in the central and southeastern sections of the project area, along the edges of the floodplains near the transition from wetland into upland. The wetlands were typically dominated by red maple, sweetgum, and willow (*Salix* spp.) trees and saplings, shrub height multiflora rose and Japanese honeysuckle, arrow-wood (*Viburnum detatum*) and an herbaceous component dominated by skunk cabbage and ostrich fern (*Matteuccia struthiopteris*).

3.4 Wildlife

3.4.1 Amphibians and Reptiles

Amphibians possibly occurring within the project area include Northern Spring Peeper (*Pseudacris crucifer crucifer*) and American Bullfrog (*Rana catesbeiana*). Reptiles possibly occurring include Red-eared Slider (*Trachemys scripta elegans*), Eastern Painted Turtle (*Chrysemys picta picta*), Common Snapping Turtle (*Chelydra serpentina*), and Eastern Box Turtle (*Terrapene carolina carolina*).

3.4.2 Birds

The North American Breeding Bird Survey conducts a route in nearby Keyport, NJ. Species observed in the Keyport route would likely be observed in Leonardo. Bird species observed were typical of an urban setting. These species include Herring Gull (*Larus argentatus*), Double-crested Cormorant (*Phalacrocorax auritus*), Canada Goose (*Branta canadensis*), Killdeer (*Charadrius vociferous*), Rock Pigeon (*Columba livia*), Mourning Dove (*Zenaida macroura*), Turkey Vulture (*Cathartes aura*), Hairy Woodpecker (*Picoides villosus*), Downy Woodpecker (*Picoides pubescens*), Blue Jay (*Cyanocitta cristata*), American Crow (*Corvus brachyrhynchos*), European Starling (*Sturnus vulgaris*), Brown-headed Cowbird (*Molothrus ater*), Red-winged Blackbird (*Agelaius phoeniceus*), Common Grackle (*Quiscalus quiscula*), House Finch (*Carpodacus mexicanus*), Song Sparrow (*Melospiza melodia*), Eastern Towhee (*Pipilo erythrophthalmus*), Northern Cardinal (*Cardinalis cardinalis*), House Sparrow (*Passer domesticus*), Northern Mockingbird (*Mimus polyglottos*), Gray Catbird (*Dumetella carolinensis*), American Robin (*Turdus migratorius*), Mallard (*Anas platyrhynchos*), Great Blue Heron (*Ardea herodias*), and Red-tailed Hawk (*Buteo jamaicensis*).

3.4.3 Mammals

Mammals within the project area are presumed to be those typically found in urban settings. These species include opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and muskrat (*Ondatra zibethica*), gray squirrel *Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*), Norway rat (*Rattus norvegicus*), skunk (*Conepauts mesoleucus*), and woodchuck (*Marmota monax*).

3.5 Threatened and Endangered Species

As outlined in the U.S. Fish and Wildlife review (Appendix A, Pertinent Correspondence) there are two known federally listed threatened species within the vicinity of the project area, the piping plover and the seabeach amaranth. A known nesting site of the federally listed (threatened) piping plover (*Charadrius melodus*) is located within 3.5 miles of the project area.

These small, territorial shorebirds are present on the New Jersey shore between March and August. Piping plovers nest above the high tide line, usually on sandy ocean beaches and barrier islands, but also on gently sloping foredunes, blowout areas behind primary dunes, washover areas cut into or between dunes, the ends of sandpits, and deposits of suitable dredged or pumped sand. Although piping plovers normally nest on high-energy, ocean beaches, there have been instances of nesting on low-energy, bay beaches. Piping plover adults and chicks feed on marine invertebrates such as worms, fly, larvae, beetles, and crustaceans. Feeding areas include intertidal zone of ocean beaches, ocean washover areas, mudflats, sandflats, wrack lines (organic material left by high tide), and the shorelines of coastal ponds, lagoons, and salt marshes. Threats to the piping plover include habitat loss, human disturbance of nesting birds, predation, and oil spills and other contaminants.

There is also a known occurrence of the federally listed (threatened) plant seabeach amaranth (*Amaranthus pumilus*) located within 3.5 miles of the project area. Seabeach amaranth is an annual plant endemic to the Atlantic Coast beaches and barrier islands, and usually grows on a pure sand substrate. Seabeach amaranth occupies a terrestrial upper beach habitat, between 8 inches and 5 feet above mean high tide. The plant is intolerant of even occasional flooding during its growing season, May through late fall. The habitat of seabeach amaranth is sparsely vegetated with annual herbs and, less commonly, perennial herbs (mostly grasses) and scattered shrubs. However, seabeach amaranth is intolerant of competition and does not occur on well-vegetated areas. Seabeach amaranth is often associated with beaches managed for protection of beach nesting birds. Threats to seabeach amaranth include beach stabilization projects (particularly the use of beach armoring, such as sea walls and riprap), intensive recreational use, and herbivory by webworm.

3.6 Cultural Resources

As a federal agency, the District has certain responsibilities for the identification, protection and preservation of cultural resources that may be located within the area of potential project effect (APE) associated with the proposed project. Present statutes and regulations governing the identification, protection and preservation of these resources include the National Historic Preservation Act of 1966 (NHPA), as amended; the National Environmental Policy Act of 1969; Executive Order 11593; and the regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties, August 2004). Significant cultural resources include any material remains of human activity eligible for inclusion on the National Register of Historic Places (NRHP).). There are no previously identified cultural resources within the project area.

The 19 structures proposed to be elevated through the original plan were surveyed and it was determined that none of the structures were historically significant. The Corps also determined that, as the proposed work to elevate the structures would be centered on the existing disturbed footprint of the building no archaeological studies would be conducted. The New Jersey Historic Preservation Office (NJHPO) concurred with the District's findings.

Of the current 25 structures understudy as Alternatives N1 and N5, seven were included in the previously selected 19 structures that were determined not eligible for the NRHP. The District project archaeologist met with NJHPO staff in July 2014 to determine if the other structures within Alternatives N1 and N5 were included in the FEMA windshield survey database. This database was developed following Hurricane Sandy to allow FEMA a rapid assessment of selected properties. All structures are within the windshield survey area and none were flagged as potential historic properties.

3.7 Coastal Zone Management

Pursuant to the Coastal Zone Management Act of 1972 and the Coastal Zone Reauthorization Act Amendments of 1990, New Jersey has defined its coastal zone boundaries and developed policies to be utilized to evaluate and issue permits for activities located within the designated coastal zone, as set forth in New Jersey's Rules on Coastal Zone Management (NJAC 7:7, NJAC 7:7E).

The NJDEP administers the coastal permit program through the Coastal Area Facility Review Act (CAFRA, New Jersey State Act 13:19-1 et seq.), the Wetlands Act of 1970 (NJSA 13:9A-1 et seq.), and the Waterfront Development Law (NJSA 12:5-3). Each of these acts provides a slightly different definition of the coastal zone; therefore, the designated coastal zone consists of the cumulative total of these three definitions.

The coastal zone boundary defined by CAFRA includes the area of the proposed action. The Waterfront Development Law defines the coastal zone as any tidal waterway within the coastal area as defined by CAFRA, up to and including the high water line. Based on these definitions, the entire area of the proposed action is located within the designated coastal zone. Therefore, a Federal consistency determination would be required for this project.

3.8 Hazardous, Toxic, and Radioactive Wastes

Subsurface soil samples were collected to identify potential Hazardous, Toxic, and Radiological Waste (HTRW) concerns associated with the subsoil. To characterize the sub-surface chemical environment in the project area, five 8-foot borings were taken and the sediments were analyzed (USACE 2001). Results of data analysis indicate that no Target Compound List (TCL) volatile organic or semi-volatile organic compounds, pesticides, or PCB's were detected in subsurface soils at concentrations in excess of NJDEP Soil Cleanup Criteria (SCC). With one exception (arsenic at 23.8 mg/kg), Resource Conservation and Recovery Act (RCRA) listed metals were not detected at concentrations in excess of NJDEP SCC. This sample location was not near any of the proposed structures.

3.9 Air Quality

The Federal Clean Air Act requires the United States Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These commonly found air pollutants (also known as criteria pollutants) are particle pollution (often referred to as particulate matter), ground-level ozone, carbon monoxide (CO), sulfur oxides (SO2), nitrogen oxides (NOx), and lead. The USEPA calls these pollutants criteria air pollutants

because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. Limits based on human health are called primary standards. The USEPA also can establish a second set of limits intended to prevent environmental and property damage, which are referred to as secondary standards. In every case except for SO2, the secondary standards established by the USEPA for the criteria pollutants are identical in level and form to their respective primary standards.

When a NAAQS is established or revised, the USEPA goes through a formal process to designate all areas of the country as either in attainment or in nonattainment. The Federal Clean Air Act further classifies ozone, carbon monoxide, and some particulate matter nonattainment areas based on the magnitude of an area's problem. Nonattainment classifications may be used to specify what air pollution reduction measures an area must adopt, and when the area must reach attainment. The technical details underlying these classifications are discussed in the Code of Federal Regulations, Part 81 (40 CFR 81).

States with areas designated as nonattainment for any criteria pollutant must develop plans that show how they will bring those areas into attainment of the standard by their designated attainment dates. Once an area meets its attainment date, it can be re-designated to attainment, but states must submit maintenance plans for these areas to the USEPA to insure continued attainment of the areas over a period of 10 years. These re-designated areas are referred to as maintenance areas.

Currently, Monmouth County is located within the NY-NJ-CT nonattainment area for annual PM2.5 and 24 hour (daily) PM 2.5 NAAQS and within the NY-NJ-CT moderate nonattainment area for 8-hour ozone.

3.10 Aesthetics and Scenic Resources

The Middletown Township Parks and Recreation Plan emphasizes the necessity of tracts for open space purposes that will contribute to and enhance the scenic and aesthetic quality of neighborhoods (Township of Middletown 2008). As outlined in the Township's 2004 Master Plan, Middletown established an Open Space Committee to develop and Open Space Preservation Plan geared towards the preservation of natural areas, wetlands, steep slopes and woodlands, water access, farmland, and historic areas. The Open Space, Recreation, and Conservation Element of the Township of Middletown Master Plan identifies coastal open space in Leonardo as potential for undeveloped, public access to natural areas.

3.11 Recreation

Middletown Township's Parks & Recreation Department offers more than 48 parks spread out over 42 square miles including many park locations that offer tennis and basketball courts, playground equipment, athletic fields, and/or picnic areas. The Township of Middletown provides Leonardo Beach and Kunkel Memorial Park near the project area. Located on Beach Avenue, Leonardo Beach is a 1.2-acre outdoor aquatic facility. Located on Brevent Avenue, Kunkel Memorial Park is a 21-acre neighborhood park with three tennis courts, one baseball/softball field, two basketball courts, one playground, and one roller hockey rink.

The State of New Jersey operates Leonardo State Marina, four blocks off Route 36 in Leonardo. By water, it is due southwest of Sandy Hook and is the closest marina to the Sandy Hook Bay entrance. The Leonardo State Marina's proximity to the east of the Earle Naval Pier makes it easily identifiable upon entrance of the bay from either New York Bay or the Atlantic Ocean. The Marina offers 176 berths with a maximum length of 50 feet and a draft of 6 feet. Services on the dockside include water, electricity, and telephone hookups.

3.12 Noise

The Code of the Township of Middletown, Chapter 182, Article I prohibits noise disturbance due to construction and landscaping activities between the hours of 9:00 pm to 7:00 am on weekdays and 9:00 pm to 8:00 am on Saturdays, Sundays, and Federal holidays.

3.13 Infrastructure

3.13.1 Natural Gas

New Jersey Natural Gas (NJNG) is the principal subsidiary of New Jersey Resources and provides natural gas to the project area. NJNG is one of the fastest-growing local distribution companies in the United States, serving more than 450,000 customers in New Jersey's Monmouth, Ocean, Middlesex, and Morris counties.

3.13.2 Electricity

Jersey Central Power & Light/First Energy supplies electricity to nearly one million commercial and residential customers in New Jersey. Its parent company, GPU Incorporated, is one of the largest investor-owned electric utilities with annual revenues of nearly $4 billion. GPU Energy also provides a variety of services, free of charge, to assist companies with relocation and expansion. Services include a computerized listing of available commercial and industrial sites, community profiles and statistics, and data on government regulations and financing options. Along with technical assistance, GPU Energy can calculate potential power needs, and suggest programs for optimum efficiency and reduced power costs.

3.13.3 Water

New Jersey-American Water, a subsidiary of American Water Works provides water service. The service area extends through 120 square miles of Monmouth County, including numerous residential and commercial centers and tourism destinations. The majority of the county's water is provided from surface sources and processed at two large facilities: the Swimming River Reservoir and Treatment Plant in Colts Neck, and the Jumping Brook Treatment Plant in Neptune.

3.13.4 Sewage

The Township of Middletown formed the Township of Middletown Sewerage Authority (TOMSA) in 1966 for meeting the wastewater collection and treatment needs of the township. The TOMSA Board of Commissioners oversees the township's centralized wastewater collection system and treatment plant, located in Belford. The Belford Sewage Treatment Plant operates under New Jersey Pollution Discharge Elimination System (NJPDES) permit number NJ0025356.

3.13.5 Stormwater

The Township of Middletown adopted the applicable design and performance standards for stormwater management measures as outlined in NJAC 7:8-5 to reduce the negative impact of stormwater runoff on water quality and quantity, and loss of groundwater recharge in receiving waterbodies. The Township of Middletown Planning and Development regulations include the stormwater management ordinance in Chapter 16, Article 10.

Leonardo has experienced tidal flooding associated with storm surges, along the banks of Wagner Creek. Ten existing storm water outfalls discharge directly into Wagner Creek. Wagner Creek additionally accepts drainage from upland areas to the south of Leonardo.

3.14 Land Use and Zoning

Leonardo is a fully developed, permanent year round residential community characterized by single-family residences. The shoreline includes a mix of public and private land. The western shoreline (Beach Avenue and areas further west) is characterized by narrow beaches while the eastern area (east of Beach Avenue) contains a mixture of private bulkheads.

All parcels considered in the proposed action are located in an urban land use zone (residential, single unit, medium density). Two of the properties are subject to New Jersey tidelands claims of title: the parcels at 3 Center Avenue and at 8 Clement Avenue. The State of New Jersey owns, in fee, all lands naturally flowed by the mean high tide within its borders. It also owns those lands once under tidal waters and since artificially filled. The current tidal lands are presumptively privately owned, but are still burdened with the state's claim. Once a claim has been identified, the state agency that must be contacted to clear title is the Tidelands Resource Council, through its staff at the Bureau of Tidelands Management in Trenton (Andersen 2005).

3.15 Socioeconomics

The Monmouth County American Community Survey for 2008-2012 income data indicates that Leonardo, a census-designated place (CDP) in Middletown Township, has lower median household income and per capita income than Monmouth County and the state of New Jersey. Borough median household income is $60,486 and per capita income is $35,806, in comparison to $84,526 and $42,749 for Monmouth County and $71,629 and $36,027 for the State. Within the Borough, 8% of families live below the poverty level. This exceeds the State's 7.9% and is almost double the 5.1% in Monmouth County. Approximately 19% of household incomes are less than $35,000 while 62% are greater than or equal to $50,000.

The population in Monmouth County increased by 171,000 between 1970 and 2010 from 459,379 to 630,378. This represents a 37% increase in 40 years, and the recent trend – 9% between 1970 and 1980, 10% between 1980 and 1990, and 11% between 1990 and 2000 – suggests the county's growth rate stabilized between 1970 and 2000. According to the year 2010 Census, the population of Leonardo was 2,757 persons. This represents a decrease of 2.3% between 2000 and 2010, less than the decrease of 25.5% between 1990 and 2000, suggesting that Leonardo's population decay is slowing. The median age in Leonardo was 40.2 years. According to the year 2008-2012 American Community Survey, the population of Leonardo was 2,316 persons. Of these, 1,885 (81.4%) were of working age (16 years or older), and 1,407 (60.7%) were in the labor force.

The total number of housing units in Leonardo is 1,055; of these, approximately 190 structures and properties are subject to damages resulting from a 1% chance (100-year) storm. According to the Census Bureau, the median value of all owner occupied units is $320,400. The total depreciated structure value in the study area is approximately $47 million at October 2013 price levels.

The majority of land in the immediate project area contains residential development with commercial development concentrated along Route 36. The majority of land development within Leonardo is more than 40 years old. Structures were mostly constructed prior to the implementation of the National Flood Insurance Program and adoption of the associated Floodplain Management Regulations.

Historically, the Bayshore played a role as a market and distribution center for the agricultural goods produced on the fertile soils of the County's interior. The Bayshore's local commercial resources were developed circa 1886. These included shellfish, clay (used in brick and tile manufacturing), and the waterfront as a tourist attraction.

The economy of Monmouth County has undergone extensive growth until recent years with much of the development concentrated along the major transportation routes. The majority of non-residential development has been for office and research facilities, probably due to the availability of comparatively inexpensive land with good access to the Northern New Jersey – New York City markets. Until recently, sectors of the above markets have been experiencing sustained growth. Although detailed data regarding the local impact of the recent economic downturn is not available, it is likely that the local conditions will parallel the regional and national trends regarding recession or recovery.

3.16 Environmental Justice

There is no disproportionately high and adverse human health or environmental effects on minority populations and low-income populations within the project. However, Leonardo has a lower median household income and per capita income than Monmouth County and the state of New Jersey. As well, within the Borough, 8.8% of families live below the poverty level. This exceeds the State's 7.4% and is almost double the 4.8% in Monmouth County

4.0 Environmental Consequences

4.1 Water Resources

4.1.1 Groundwater

No significant impacts to groundwater resources are expected as a result of implementation of the proposed project since construction activities will be limited to the immediate areas of the individual structure foundations. Foundations will not be built any deeper than they are at present, thus groundwater flow will not be affected.

4.1.2 Surface Water

No significant impacts to surface water resources are expected as a result of implementation of the proposed project since building elevations will be on the footprint of the existing buildings.

4.2 Vegetation

4.2.1 Uplands

Implementation of the proposed action would affect vegetation on the properties under consideration since they would be removed to provide safe access for construction equipment when necessary. However, subsequent post-construction landscaping would mitigate the impact of vegetation loss.

4.2.2 Wetlands

Some of the structures are located near wetlands. Since all construction activities will occur within the current footprint of the structure, there will be no impacts to the wetlands. Best management practices will be utilized during construction activities to avoid any encroachment into the wetlands.

4.3 Wildlife

There are no wildlife resources located within the footprint of the proposed structures. Construction staging areas would be located on streets or parking lots, and since noise and dust generation would be extremely limited in space and time, no significant impacts are anticipated due to the proposed action. Any wildlife near the construction activities would be able to relocate.

4.3.1 Amphibians and Reptiles

There are no amphibians and reptiles located within the footprint of proposed structures. Construction staging areas would be located on streets or parking lots, and since noise and dust generation would be extremely limited in space and time, no significant impacts are anticipated due to the proposed action. Any amphibians and reptiles near the construction activities would be able to relocate.

4.3.2 Birds

There are no birds located within the footprint of proposed structures. Construction staging areas would be located on streets or parking lots, and since noise and dust generation would be extremely limited in space and time, no significant impacts are anticipated due to the proposed action. Any birds near the construction activities would be able to relocate.

4.3.3 Mammals

There are no mammals located within the footprint of proposed structures. Construction staging areas would be located on streets or parking lots, and since noise and dust generation would be extremely limited in space and time, no significant impacts are anticipated due to the proposed action. Any mammals near the construction activities would be able to relocate.

4.4 Threatened and Endangered Species

The proposed action lies outside of beach habitat and outside of areas suitable for threatened and endangered species, to include the piping plover and seabeach amaranth. Therefore, there would be no impacts to threatened or endangered species as a result of the implementation of the proposed project (Appendix A).

4.5 Cultural Resources

None of the structures proposed to be elevated under Alternatives N1 and N5 are historically significant. The District maintains the opinion that no archaeological testing will be conducted as work is anticipated to remain in the disturbed footprint resulting from the structure's original construction. Should this assessment change as plans are developed the District will coordinate such modifications with NJHPO. It is the District's opinion that the Leonardo TSP as presently proposed will have no effect on historic properties and no further cultural resources studies will be conducted unless proposed plans are modified. The NJHPO, the Delaware Nation, and the Delaware Tribe of Indians concurred with this opinion (Appendix A).

4.6 Coastal Zone Management

No significant impacts are anticipated on coastal zone regulations as a result of implementation of the proposed project. The on-site raising of structures would be coordinated with the NJDEP, at least one year in advance of construction, to provide ample time to comply with coastal zone regulations. See Appendix B for the New Jersey Coastal Zone Act Consistency Statement.

4.7 Hazardous, Toxic, and Radioactive Wastes

Assuming that the test locations investigated are representative of conditions within the project area (USACE 2001), no significant impact to the environment from HTRW is expected as a result of implementation of the proposed action. Products used in construction activities that are potentially toxic would be handled according to proper procedures and/or disposed of appropriately.

4.8 Air Quality

There would be no significant impact to the quality of the air due to the proposed action (Appendix C). The proposed action has undergone an emission inventory to evaluate the applicability of the General Conformity regulations of 40 CFR 93 Subpart B. The calculated emissions of Nitrogen Oxides (NO_x), Volatile Organic Compounds (VOC), and Carbon Monoxide (CO) for the project are less than the 100 ton-per-year conformity threshold for each pollutant as established by 40 CFR 93.153 (b). Each of the three above pollutants is calculated at less than 1 ton per year. The proposed action is not considered regionally significant under 40 CFR 93.153 (i). Any fugitive dust generated due to construction activities would be contained according to proper standards and procedures.

4.9 Aesthetics and Scenic Resources

Implementation of the proposed action may cause disruption of loss of bay views for some residents. Any visual impacts associated with elevating structures would be mitigated through proper design and construction, while conforming to local and state building codes. However,

some views may be permanently lost. Some vegetation on the affected properties would be removed to provide construction access. However, construction will involve landscaping that will mitigate the impacts.

4.10 Recreation

Implementation of the proposed action would cause disruption or loss of bay views and waterfront access, particularly along Beach Avenue and Burlington Avenue. Any visual impacts associated with elevating one or more structures would be mitigated through proper design and construction, while conforming to local and state building codes.

4.11 Noise

There would be no significant impacts from noise disturbances due to the proposed action. Construction activities related to the proposed action would be limited to day time hours, out of the noise disturbance prohibitions required by the Township of Middletown (no noise disturbance between the hours of 9:00 pm to 7:00 am on weekdays and 9:00 pm to 8:00 am on Saturdays, Sundays, and Federal holidays).

4.12 Infrastructure

There would be no significant impact on infrastructure as a result of the proposed action. Electric power and other utilities would be temporarily shut down during construction periods at individual building sites for construction worker safety and fire prevention. Utilities would be returned to normal working conditions as soon as possible after construction completion at each of the proposed buildings. There are no infrastructure facilities in close proximity to any of the proposed structures.

4.13 Land Use and Zoning

Land use zoning would remain the same and all parcels would continue to be used as residential properties. There would be no significant impact as a result of implementation of the proposed project on land use within the project area.

4.14 Socioeconomics

There would be no significant impact on the economy of the project area as a result of implementation of the proposed project. Economic conditions would improve since the recurrent cost to affected residents of cleaning up and rebuilding after floods would be alleviated.

4.15 Environmental Justice

There are no significant environmental impacts on the residents of the borough. Directly affected residents, as well as the surrounding community would be helped both economically as well as socially by implementation of the proposed project. The decision to raise/rebuild these particular structures was made on technical merit without regard to the income of any affected resident.

5.0 CUMULATIVE IMPACTS

No cumulative impacts are expected as a result of implementation of the proposed action. There is no increase in footprint size of these structures and therefore does not change floodplain characteristics. Other District projects currently in study or construction phase in the Bayshore area include Port Monmouth, Union Beach, Highlands, and Shrewsbury. The minimal scale of this project in relation to the Bayshore landscape would not contribute significant cumulative impacts.

6.0 Unavoidable Adverse Impacts

The unavoidable adverse impacts of implementation of this project are as follows:

- Temporary relocation of residents during construction.
- Disruption of community and personal lives due to temporary business interruptions and relocations
- Temporary construction staging areas (most likely on roads and/or parking lots) would be utilized resulting in a local inconvenience to drivers.
- Temporary noise and air emissions during construction activity at the construction sites.

7.0 Coordination and Compliance with Environmental Requirements

A public notice announcing the availability of the Environmental Assessment for public review was placed on the New York District's Website.

The District has coordinated with NJ Historic Preservation Office in April 2008 and July 2014.

A letter in July 2010 was sent to the U.S. Fish and Wildlife Service (USFWS) requesting their determination on federally listed threatened and endangered species. The USFWS responded in August 2010 stating that the project is outside of beach habitat and not within areas suitable for threatened and endangered species. The USFWS concurred that the Leonardo project has no effect on piping plovers and seabeach amaranth.

Table 1: Summary of Primary Federal Laws and Regulations Applicable to the Proposed Project

Legislative Title	U. S. Code/Other	Compliance
Clean Air Act	42 U.S.C. §§ 7401-7671g	A General Conformity Rule determination and analyses and a final Statement of Conformity are included in Appendix C.
Clean Water Act	33 U.S.C. §§ 1251 et seq.	The District produced an evaluation complying with the Clean Water Act in Appendix D.
Coastal Zone Management Act	16 U.S.C. §§ 1451-1464 N.J.A.C. 7:7 and N.J.A.C. 7:7E	A CZM Determination was prepared and is located in Appendix B.
Endangered Species Act of 1973	16 U.S.C. §§ 1531 et seq.	The District has completed Section 7 Coordination the Service regarding endangered species and located in Appendix A.
Environmental Justice in Minority and Low Income Populations	Executive Order 12898	The District performed an analysis and has determined that a disproportionate negative impact on minority or low-income groups in the community is not anticipated and a full evaluation of Environmental Justice issues is not required.
Fish and Wildlife Coordination Act	16 U.S.C. § 661 et seq.	The District coordinated with the USFWS and determined no FWCA report is necessary.
National Environmental Policy Act of 1969	42 U.S.C. §§ 4321-4347	The preparation and circulation of this EA provides compliance.
National Historic Preservation Act of 1966	16 U.S.C. §§ 470 et seq.	The District coordinated with the State Historic Preservation Office to fulfill requirements of this act (Appendix A).
Executive Order 11990, Protection of Wetlands	May 24, 1977	Circulation of this report for public and agency review fulfills the requirements of this order.
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	April 21, 1997	Circulation of this report for public and agency review fulfills the requirements of this order.

Table 2: List of Report Preparers

Individual	Responsibility
Matthew Voisine	Biologist; NEPA
Lynn Rakos	Archeologist: NEPA, SEC. 106
Richard Dabal	Environmental Scientist: HTRW, NEPA

8.0 References

Andersen, William E. December 2005. *Top 10 Tips on Handling Tidelands Applications*. New Jersey Lawyer Magazine, No. 237.

New Jersey Administrative Code (NJAC) 7:7. April 2008. Coastal Permit Program Rules.

Township of Middletown, New Jersey. 2008. Middletown Parks, Recreation, and Open Space Master Plan.

U.S. Army Corps of Engineers. 2010. Leonardo, NJ Feasibility Study, Alternative Formulation Briefing Technical Memorandum, New York District, Planning Division, Plan Formulation Branch.

U. S. Army Corps of Engineers. June 2002. Wetland Delineation Report. Raritan Bay and Sandy Hook Bay Hurricane and Storm Damage Reduction Study, Leonardo, New Jersey.

U. S. Army Corps of Engineers. 2001. Final HTRW Investigation, Monmouth County, NJ. NY District, Planning Division, Environmental Analysis Branch. Prepared for U.S. Army Corps of Engineers, New York District, by AMEC Earth & Environmental. Contract Number DACW51-97-D-0010, Delivery Order 0098.

U.S. Army Corps of Engineers. 1999. *Raritan Bay and Sandy Hook Bay, Leonardo, New Jersey, Pre-Feasibility Report for Hurricane Storm Damage Reduction and Erosion Control.* New York District.

U.S. Army Corps of Engineers. 1993. *Raritan Bay and Sandy Hook Bay, New Jersey, Reconnaissance Report for Hurricane Storm Damage Reduction and Shore Protection.* New York District.

U.S. Environmental Protection Agency (USEPA) May 1988. U.S. EPA Region 2: New Jersey Coastal Plain Aquifer [Online]. Available: http://www.epa.gov/region02/water/aquifer/coast/coastpln.htm [Accessed August 17, 2010].

U.S. Fish and Wildlife Service (USFWS). November 1997. Significant Habitats and Habitat Complexes of the New York Bight Watershed [On-line]. Available: http://library.fws.gov/pubs5/begin.htm. [Accessed August 20, 2010].

APPENDIX A

PERTINENT CORRESPONDENCE

The Delaware Nation
Cultural Preservation Office
P.O. Box 825 - 31064 State Highway 281- Anadarko, OK 73005
Phone: 405/247-2448 – Fax: 405/247-8905

NAGPRA ext. 1403
Section 106 ext. 1181
Museum ext. 1181
Library ext. 1196
Clerk ext. 1182

December 10, 2014

RE: U.S. Army Corps of Engineers, New York District (Corps) is proceeding with the Leonardo, Raritan Bay and Sandy Hook Bay, NJ, Coastal Storm Risk Management Feasibility Study (Leonardo), Middletown Township, Monmouth County, NJ

Ms. Rakos,

The Delaware Nation Cultural Preservation Department received correspondence regarding the above referenced project. Our office is committed to protecting sites important to tribal heritage, culture and religion. Furthermore, the tribe is particularly concerned with archaeological sites that may contain human burials or remains, and associated funerary objects.

As described in your correspondence and upon research of our database(s) and files, we find that the Lenape people occupied this area either prehistorically or historically. However, the location of the project does not endanger cultural or religious sites of interest to the Delaware Nation. Please continue with the project as planned. However, should this project inadvertently uncover an archaeological site or object(s), we request that you halt all construction and ground disturbance activities and immediately contact the appropriate state agencies, as well as our office (within 24 hours).

Please Note the Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Band of Mohican Indians are the only Federally Recognized Delaware/Lenape entities in the United States and consultation must be made only with designated staff of these three tribes. We appreciate your cooperation in contacting the Delaware Nation Cultural Preservation Office to conduct proper Section 106 consultation. Should you have any questions regarding this email or future consultation feel free to contact our offices at 405-247-2448 or by email nalligood@delawarenation.com.

Sincerely,

Nekole Alligood

Nekole Alligood
Director

Delaware Tribe Historic Preservation Representatives
Department of Anthropology
Gladfelter Hall
Temple University
1115 W. Polett Walk
Philadelphia, PA 19122
temple@delawaretribe.org

December 4, 2014

Department of the Army
Attn: Lynn Rakos
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, N.Y. 10278

Re: Leonardo, Raritan Bay and Sandy Hook Bay, NJ, Coastal Storm Risk Management Feasibility Study

Dear Lynn Rakos,

Thank you for notifying the Delaware Tribe of the above referenced project. We have no objection to the proposed project as long as work remains within the footprint of the house and all heavy machinery operates from previously disturbed areas. We understand that any potential resources located within the surrounding areas will not be impacted as long as the contractors remain within the original footprint of the buildings.

We ask that if any archaeological remains (artifacts, subsurface features, etc.) are discovered during the construction process that construction be halted until an archaeologist can view and assess the finds. Furthermore, we ask that if any human remains are accidentally unearthed during the course of the project that you cease development immediately and inform the Delaware Tribe of Indians of the inadvertent discovery. If you have any questions, feel free to contact this office by phone at (609) 220-1047 or by e-mail at temple@delawaretribe.org.

Sincerely,

Blair Fink

Blair Fink
Delaware Tribe Historic Preservation Representatives
Department of Anthropology
Gladfelter Hall
Temple University
1115 W. Polett Walk
Philadelphia, PA 19122

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, NY 10278-0090

REPLY TO
ATTENTION OF

July 27, 2010

Planning Division, Environmental Branch

Ron Popowski
927 N. Main Street
Heritage Square, Building D
Pleasantville, New Jersey 08232

RE: ES-01/315, Leonardo Combined Erosion Control and Storm Damage Prevention Project
Middletown Township, Monmouth County, New Jersey

Dear Mr. Popowski;

The US Army Corps of Engineers, New York District (Corps) would like to update the USFWS on the status of the above mentioned project that was previously coordinated with you in 2001. During our last correspondence in 2001, this project was scoped to involve the construction of a protective dune and berm, periodic renourishment of the beach along the Raritan Bay shoreline, and construction of a bulkhead and floodwalls along the Leonardo State Marina inlet. However, since that time the USACE has continued to analyze alternatives based on economic, engineering, and environmental considerations. The resulting preferred selection is a non-structural alternative that has the concurrence of the local sponsor, the New Jersey Department of Environmental Protection (NJDEP). The revised scope of this project involves the elevation of 18 residential buildings and the relocation of one residential building in the 5-year floodplain in Leonardo, Middletown Township, Monmouth County, New Jersey due to significant flooding.

The addresses of the affected residential buildings, all in the 07737 zip code, are listed below. One residential building, listed as number 13 below, will be relocated within the same parcel. All the other residential buildings will be raised in elevation within their existing footprint.

1. 227 Bay Avenue
2. 229 Bay Avenue
3. 230 Beach Avenue
4. 5 Benton Avenue
5. 6 Benton Avenue
6. 18 Benton Avenue
7. 20 Benton Avenue
8. 22 Benton Avenue
9. 24 Benton Avenue
10. 29 Burlington Avenue
11. 57 Burlington Avenue

12. 403 Cedar Avenue
13. 3 Center Street
14. 8 Clement Street
15. 2 Highland Avenue
16. 4 Highland Avenue
17. 10 North Leonard Avenue
18. 18 North Leonard Avenue
19. 1 Roop Avenue

The Corps requests the reconsideration of your previous determination with respect to federally listed or proposed threatened or endangered flora and fauna under USFWS jurisdiction since the project status has changed. A copy of your previous letters, a map showing the locations of the affected land parcels, and the preliminary draft plans for the relocation of the one residential building are enclosed for your information. Please provide a response with the status of your consideration by August 31 to ensure we remain within the anticipated project schedule. If you have any questions, please contact the Project Biologist, Hibba Wahbeh at (917) 790-8709.

Sincerely,

Jenine Gallo
Chief, Estuary Section,
Environmental Analysis Branch

Enclosures Previous correspondence on ES-01/315
Preliminary draft plans for the relocation of residential building at 3 Center Street
Map of affected parcel locations

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://www.fws.gov/northeast/njfieldoffice

In Reply Refer to:
10-CPA-0211

AUG 24 2010

Jenine Gallo, Chief, Estuary Section
Environmental Analysis Branch
U.S. Army Corps of Engineers, New York District
26 Federal Plaza
New York, New York 10278-0090
Attn: Hibba Wahbeh

Dear Ms. Gallo:

The U.S. Fish and Wildlife Service (Service) has reviewed your July 27, 2010 letter regarding the update on the status of the U.S. Army Corps of Engineers' (Corps) Leonardo Combined Erosion Control and Storm Damage Prevention Project (Leonardo Project) located in Middletown Township, Monmouth County, New Jersey. In addition, the Corps requested the Service reconsider its previous determination. During our last correspondence in 2001, this project was scoped to involve the construction of a protective dune and berm, periodic renourishment of the beach along the Raritan Bay shoreline, and construction of a bulkhead and floodwalls along the Leonardo State Marina Inlet. However, since that time the Corps has continued to analyze alternatives based on economic, engineering, and environmental considerations. The resulting preferred selection is a non-structural alternative that has the concurrence of local sponsor, the New Jersey Department of Environmental Protection (NJDEP). The revised scope of this project involves the elevation of 18 residential buildings and the relocation of one residential building in the 5-year floodplain in Leonardo due to significant flooding, tentatively scheduled to begin ground work in the fall of 2011.

AUTHORITY

The following comments on the proposed activity have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*) and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

A known nesting site of the federally listed (threatened) piping plover (*Charadrius melodus*) is located within 3.5 miles of the project area. These small, territorial shorebirds are present on the

New Jersey shore between March and August. Piping plovers nest above the high tide line, usually on sandy ocean beaches and barrier islands, but also on gently sloping foredunes, blowout areas behind primary dunes, washover areas cut into or between dunes, the ends of sandpits, and deposits of suitable dredged or pumped sand. Although piping plovers normally nest on high-energy, ocean beaches, there have been instances of nesting on low-energy, bay beaches. Piping plover adults and chicks feed on marine invertebrates such as worms, fly, larvae, beetles, and crustaceans. Feeding areas include intertidal zone of ocean beaches, ocean washover areas, mudflats, sandflats, wrack lines (organic ocean material left by high tide), and the shorelines of coastal ponds, lagoons, and salt marshes. Threats to the piping plover include habitat loss, human disturbance of nesting birds, predation, and oil spills and other contaminants.

There is also a known occurrence of the federally listed (threatened) plant seabeach amaranth (*Amaranthus pumilus*) located within 3.5 miles of the project area. Seabeach amaranth is an annual plant endemic to Atlantic Coast beaches and barrier islands, and usually grows on a pure sand substrate. Seabeach amaranth occupies a terrestrial upper beach habitat, between 8 inches and 5 feet above mean high tide. The plant is intolerant of even occasional flooding during its growing season, May through late fall. The habitat of seabeach amaranth is sparsely vegetated with annual herbs and, less commonly, perennial herbs (mostly grasses) and scattered shrubs. However, seabeach amaranth is intolerant of competition and does not occur on well-vegetated areas. Seabeach amaranth is often associated with beaches managed for protection of beach nesting birds. Threats to seabeach amaranth include beach stabilization projects (particularly the use of beach armoring, such as sea walls and rip rap), intensive recreational use, and herbivory by webworm.

SERVICE REVIEW

The Service prefers non-structural alternatives involving elevation of 18 residential buildings and the relocation of one residential building. The revised project activities will be outside of beach habitat and not within areas suitable for threatened and endangered species. Based on the current project description and location changes, the Service concurs that Leonardo Project has no effect on piping plovers and seabeach amaranth.

Should you have any questions, please contact Ron Popowski by e-mail at Ron_Popowski@fws.gov.

Sincerely,

Timothy Hall

Acting Supervisor

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO THE ATTENTION OF
Environmental Analysis Branch

30 April, 2008

ATTN: Carissa Scarpa
08-1324-1 DF
HPO E2008-181

Ms. Dorothy P. Guzzo
Deputy State Historic Preservation Officer
Historic Preservation Office
New Jersey Department of Environmental Protection
CN 404
Trenton, New Jersey 08625-0404

Dear Ms. Guzzo:

The United States Army Corps of Engineers would like to inform you of the Leonardo, New Jersey Combined Erosion and Storm Damage Prevention Project. The project will provide 100-year level flood protection to 19 residential structures within the town of Leonardo. To achieve the desired level of protection, the selected structures will be raised to 14.2 feet NGVD. Included with this letter please find a map identifying the project area, a map identifying the individual structures within the project area, and photographs of the selected structures (Attachments 1-3). Based on an initial assessment it has been determined that none of the selected structures are eligible for the National Register of Historic Places. It has also been determined that the group of houses is not eligible as a historic district on the National Register of Historic Places. Furthermore, the anticipated level of ground disturbance from raising activities is expected to be centered around the existing foundations and therefore is not expected to have the potential to adversely impact archaeological deposits. Therefore, it is the Corps opinion that further study, consisting of historic map research, additional documentary research, and intensive field survey, is not necessary at this time.

When the project plans are developed, further consultation will be carried out with your office to present the plans and address any potential changes to the plan or disturbances to areas outside the original house foundations. In accordance with Section 106 of the National Historic Preservation Act of 1966, as Amended, please provide your concurrence or comment within 30 days of receipt of this letter. If you have any questions please contact the Project Archaeologist, Carissa Scarpa at 917 790 8612.

I concur with your finding that there are no historic properties affected within the project's area of potential effects. Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106 consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13. (NP)

Enclosure

5-23-2008
Date

Deputy State Historic Preservation Officer

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

HPO-L2014-176
15-0939-1
RECEIVED

NOV 17 2014

HISTORIC PRESERVATION OFFICE

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278-0090

13 November 2014

Environmental Assessment Section
Environmental Analysis Branch

Mr. Daniel Saunders
Deputy State Historic Preservation Officer
Historic Preservation Office
New Jersey Department of Environmental Protection
PO Box 404
Trenton, New Jersey 08625-0404

Dear Mr. Saunders:

The U.S. Army Corps of Engineers, New York District (Corps) is proceeding with the Leonardo, Raritan Bay and Sandy Hook Bay, NJ, Coastal Storm Risk Management Feasibility Study (Leonardo). The Leonardo study area is in Middletown Township, Monmouth County, New Jersey (Enclosure 1). Prior to Hurricane Sandy, in October 2012, the Leonardo feasibility study was nearing completion. The alternative then proposed was a non-structural solution achieved through elevating 19 structures. As a result of Hurricane Sandy, a majority of the structures (12 out of 19) sustained significant flood damages and have since been either raised or elevated. Due to damages sustained by the previously identified 19 structures and given additional damages in the Leonardo area the Corps is reassessing the project and has received funding to complete the feasibility study under the Hurricane Sandy Disaster Relief Appropriations Bill (P.L. 113-2).

The current Tentatively Selected Plan (TSP) consists of a total of 25 structures that will be subject to non-structural measures which for this project entails elevating them to reduce risk of damages from future flood events. This plan is combination of two alternatives, N1 and N5. Alternative N1 includes 24 structures that are in the 5-year flood plain. Alternative N5 includes 11 structures with a main floor at or below 9.4 feet North American Vertical Datum (NAVD) and ground elevation lower than 7.9 ft NAVD. Eight structures are common to both alternatives (Enclosures 2 - 6). Seven of the structures currently under study were amongst the original 19 selected for non-structural measures prior to Hurricane Sandy (Enclosure 7).

The original plan of elevating 19 structures was coordinated with your office. The Corps had determined that none of the structures were historically significant. The Corps also determined that as the proposed work to elevate the structures would be centered on the existing disturbed footprint of the building no archaeological studies would be conducted. Your office concurred with the Corps' findings (Enclosure 8).

On 9 July 2104 Lynn Rakos of my staff met with Michelle Hughes at your office to determine if the structures within Alternatives N1 and N5 were included in the FEMA windshield survey database. All structures are within the windshield survey area and none were flagged as potential historic properties.

The Corps maintains the opinion that no archaeological testing will be conducted as work is anticipated to remain in the disturbed footprint resulting from the structure's original construction. Should this assessment change as plans are developed we will coordinate such modifications with your office.

It is the Corps opinion that the Leonardo TSP as presently proposed will have no effect on historic properties. No further cultural resources studies will be conducted unless proposed plans are modified. Please review the enclosed material and provide Section 106 comments pursuant to 36 CFR 800.5. If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (917) 790-8629.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures

CC (w/ Enclosures):
Blair Fink, Delaware Tribe Historic Preservation Representative
Jason Ross, Delaware Nation, Section 106 Manager

CONCUR

Daniel D. Saunders
DEPUTY STATE HISTORIC PRESERVATION OFFICER

12/10/14
DATE

From: Popowski, Ron
To: Voisine, Matthew NAN02
Subject: Re: [EXTERNAL] Re: (UNCLASSIFIED)
Date: Friday, 08 November, 2013 12:52:04 PM
Attachments: Leonardo.pdf

Hi Matthew,

Attached is a copy of our August 24, 2010 letter responding to your July 27, 2010 request. If there's no changes as proposed in your July 27, 2010 letter, our August 2010 letter should wrap this up. Please let me know if there's any changes.

Thanks,

On Wed, Nov 6, 2013 at 11:32 AM, Voisine, Matthew NAN02 <Matthew.Voisine@usace.army.mil> wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Ron
>
> I forgot that you asked for the EA also. It is attached
>
> Matthew Voisine
> Biologist
> USACE- NY District
> 26 Federal Plaza
> Room 2151
> NY, NY 10278
> 917.790.8718 voice
> 702.271.0496 mobile
> 212.264.0961 fax
>
> -----Original Message-----
> From: Popowski, Ron [mailto:ron_popowski@fws.gov]
> Sent: Wednesday, November 06, 2013 9:35 AM
> To: Voisine, Matthew NAN02
> Subject: [EXTERNAL] Re: (UNCLASSIFIED)
>
> Got it, thanks...
>
> On Wed, Nov 6, 2013 at 9:06 AM, Voisine, Matthew NAN02 <Matthew.Voisine@usace.army.mil> wrote:
>
> > Classification: UNCLASSIFIED
> > Caveats: NONE

Ron

Attached is the 2001 Leonardo Planning Aid Letter

Thank you

Matthew Voisine

Biologist

USACE- NY District

26 Federal Plaza

Room 2151

NY, NY 10278

917.790.8718 voice

702.271.0496 mobile

212.264.0961 fax

Classification: UNCLASSIFIED
Caveats: NONE

--
Ron Popowski
Asst. Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
Ecological Services
927 N. Main Street, Bldg. D
Pleasantville, New Jersey 08232

609.241.7065
609.646.0352 FAX

Celebrate the 40th anniversary of the Endangered Species Act!
<http://www.fws.gov/endangered/ESA40/index.html>

Classification: UNCLASSIFIED

Caveats: NONE

--
Ron Popowski
Asst. Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
Ecological Services
927 N. Main Street, Bldg. D
Pleasantville, New Jersey 08232

609.241.7065
609.646.0352 FAX

Celebrate the 40th anniversary of the Endangered Species Act!
<http://www.fws.gov/endangered/ESA40/index.html>

APPENDIX B

NEW JERSEY COASTAL ZONE ACT CONSISTENCY STATEMENT

NEW JERSEY COASTAL ZONE MANAGEMENT EVALUATION
FLOOD RISK MANAGEMENT PROJECT LEONARDO, NEW JERSEY

INTRODUCTION

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. §§1451-1466) was enacted by Congress in an effort to balance the often competing demands of growth and development with the protection of coastal resources. Its stated purpose is to "…preserve, protect, and develop, where possible, to restore or enhance the resources of the nation's coastal zone…" The Act established the framework for achieving this balance by encouraging the states to develop coastal zone management programs, consistent with minimum federal standards, designed to regulate land use activities that could impact coastal resources. The Coastal Zone Act Reauthorization Act Amendments of 1990 further strengthened the act by requiring the state programs to focus more on controlling land use activities and the cumulative effects of activities within designated coastal zones.

The State of New Jersey administers its federally approved coastal zone program through the Department of Environmental Protection, Land Use Regulation Program (LURP). Pursuant to the Federal CZMA, New Jersey has defined its coastal zone boundaries and developed policies to be utilized to evaluate projects within the designated coastal zone, as set forth in New Jersey's Rules on Coastal Zone Management (CZM) (N.J.A.C. 7:7, 7:7E, dated January 7, 2003). The Waterfront Development Law (N.J.S.A. 12:5-3) and related requirements (N.J.A.C. 7:7-3) provide the authority for issuance of permits for, among other activities the reconstruction (with or without expansion) of single-family homes.

The State's Land Use Regulation Program in the review of permit applications and coastal decision-making employs New Jersey's rules on Coastal Zone Management; they address issues of location, use, and resources. New Jersey's rules provide for a balance between economic development, and coastal resource protection, recognizing that coastal management involves explicit consideration of a broad range of concerns, in contrast to other resource management programs that have a more limited scope of concern.

The proposed project is for flood risk management, located within the designated coastal zone of New Jersey, in Leonardo, Monmouth County. The following assessment identified the coastal zone management policies relevant to the proposed project.

DISCUSSION OF NEW JERSEY COASTAL ZONE MANAGEMENT POLICIES APPLICABLE TO THE PROPOSED PROJECT

The following section identifies the New Jersey CZM policies, identifies how they are applicable to the proposed project, and discusses the project issues relevant to each.

SUBCHAPTER 3 – SPECIAL AREAS

7:7E-3.2 SHELLFISH HABITAT

This policy generally limits disturbance of shellfish habitat.

The proposed project is not located in shellfish habitat would not contaminate surface water; therefore this policy would not be applicable to the proposed project.

7:7E-3.3 SURF CLAM AREAS

This policy prohibits development that would destroy or contaminate surf clam areas.

The proposed project is not located in a surf clam area nor would it contaminate surface water, therefore this policy would not be applicable to the proposed project.

7:7E-3.4 PRIME FISHING AREAS

This policy prohibits sand or gravel submarine mining in prime fishing areas.

The proposed project does not involve submarine mining nor is it affecting tidal water areas and water‘s edge areas, which have a demonstrable history of supporting a significant local intensity of recreational or commercial fishing activity; therefore this policy would not be applicable to the proposed project.

7:7E-3.5 FINFISH MIGRATORY PATHWAYS

This policy prohibits development such as dams, dikes, spillways, channelization, tide gates, and intake pipes that would create physical barriers to migratory fish or degrade water quality such that it interferes with fish movement.

The proposed project would not create permanent physical barriers to migratory fish nor would it degrade water quality; therefore this policy would not be applicable to the proposed project.

7:7E-3.6 SUBMERGED VEGETATION HABITAT

This policy prohibits or restricts development at or near submerged vegetation habitats unless compensation efforts establish self-sustaining habitat for the appropriate species.

This policy would not be applicable since the proposed project is not located in water areas supporting or documented as previously supporting rooted, submerged vascular plants.

7:7E-3.7 NAVIGATION CHANNELS

This policy prohibits construction that would extend into a navigation channel or would result in the loss of navigability. This policy discourages the placement of structures within 50 feet of any authorized navigation channel, unless it can be demonstrated that the proposed structure will not hinder navigation. This policy requires appropriate mitigation measures for development, which would cause terrestrial soil and shoreline erosion and siltation in navigation channels.

This policy would not be applicable since the project is not located on or near navigation channels.

7:7E-3.8 CANALS

This policy prohibits actions that would interfere with boat traffic in canals used for navigation, defined as navigation channels for boat traffic through land areas, which are created by cutting and dredging or other human construction technique sometimes enlarging existing natural surface water channels.

This policy would not be applicable because the proposed project does not involve or affect navigation channels used for boat traffic through land areas.

7:7E-3.9 INLETS

This policy prohibits filling and discourages submerged infrastructure in inlets, which are natural channels through barrier islands allowing movement of fresh and salt water between the ocean and the back bay system.

This policy would not be applicable because the proposed project is not located in an inlet.

7:7E-3.10 MARINA MOORINGS

This policy prohibits non-water dependent development in marina mooring areas and discourages any use that would detract from existing or proposed recreational boating use in marina mooring areas.

This policy would not be applicable since the proposed project does not involve development in any marina mooring areas nor does it detract from existing or proposed recreational boating use in marina mooring areas.

7:7E-3.11 PORTS

This policy prohibits actions that would preempt or interfere with port uses. Ports are water areas having, or lying immediately adjacent to, concentrations of shoreside marine terminals and transfer facilities for the movement of waterborne cargo (including fluids), and including facilities for loading, unloading and temporary storage.

This policy would not be applicable since the proposed project is not located in a port.

7:7E-3.12 SUBMERGED INFRASTRUCTURE ROUTES

This policy prohibits any activity that would increase the likelihood of submerged infrastructure damage or breakage, or interfere with maintenance operations.

This policy would not be applicable since the proposed project is not in an area with submerged infrastructure routes.

7:7E-3.13 SHIPWRECK AND ARTIFICIAL REEF HABITATS

This policy restricts the use of areas with shipwrecks and artificial reefs that would adversely affect the usefulness of the area as a fisheries resource.

This policy would not be applicable since there are no shipwrecks or artificial reef habitats in the proposed project area.

7:7E-3.14 WET BORROW PITS

This policy restricts the use and filling or wet borrow pits.

This policy would not be applicable since the proposed project does not contain nor will make use of any wet borrow pits.

7:7E-3.15 INTERTIDAL AND SUBTIDAL SHALLOWS

This policy discourages disturbance of shallow water areas (all permanently or temporarily submerged areas from the spring high water line to a depth of four feet below mean low water).

This policy would not be applicable since the proposed project is not located on or near intertidal or subtidal shallows.

7:7E-3.16 DUNES

This policy prohibits development on dunes and removal of vegetation from dunes.

This policy would not be applicable since the proposed project is not located on or near dunes.

7:7E-3.17 OVERWASH AREAS

This policy restricts development in overwash areas, an area subject to accumulation of sediment, usually sand, that is deposited landward of the beach or dune by the rush of water over the crest of the beach berm, a dune or a structure.

This policy would not be applicable since the proposed project is not located on overwash areas.

7:7E-3.18 COASTAL HIGH HAZARD AREAS

This policy restricts development in coastal high hazard areas, flood prone areas subject to high velocity waters as delineated on FEMA maps. The coastal high hazard area is identified as Zone V on Flood Insurance Rate Maps (FIRMs).

A portion of the proposed project is located in coastal high hazard areas. The proposed project will increase protection to and will meet the standards of the housing use rules (§ 7:7E-7.2) in the Coastal High Hazard Areas, therefore this project would be consistent with this policy.

7:7E-3.19 EROSION HAZARD AREAS

This policy prohibits development in erosion hazard areas under most circumstances, to protect public safety. Erosion hazard areas are shoreline areas that are eroding and/or have a history of erosion, causing them to be highly susceptible to further erosion, and damage from storms.

This policy would not be applicable since the proposed project is not located on shoreline areas.

7:7E-3.20 BARRIER ISLAND CORRIDOR

This policy restricts new development on barrier islands. Barrier island corridors are the interior portions of oceanfront barrier islands, spits, and peninsulas.

This policy would not be applicable because the proposed project is not located on a barrier island corridor.

7:7E-3.21 BAY ISLANDS

This policy restricts development on bay islands, islands or filled areas surrounded by tidal waters, wetlands, beaches, or dunes, lying between the mainland and barrier island.

This policy would not be applicable since the proposed project is not located on bay islands.

7:7E-3.22 BEACHES

This policy restricts development on beach areas.

This policy would not be applicable since the proposed project is not located on any beaches.

7:7E-3.23 FILLED WATER'S EDGE

This policy seeks to promote water dependent uses at areas along the waterfront that have been previously filled.

This policy would not be applicable since there are no areas of filled water's edge in the proposed project area.

7:7E-3.24 EXISTING LAGOON EDGES

This policy restricts development at lagoon edges.

This policy would not be applicable since the proposed project is not located along any lagoon edges.

7:7E-3.25 FLOOD HAZARD AREAS

This policy is designed to restrict development in flood hazard areas to ensure that the waterfront is not pre-empted by uses that could function equally at inland locations. The goal of this rule is to reduce losses of life and property resulting from unwise development of flood hazard areas, and allow uses compatible with periodic flooding.

The proposed project would involve elevating/re-locating residential buildings in flood hazard areas to minimize flood damage. The proposed project would conform to the applicable design and construction standards; therefore, the proposed project would be compatible with this policy.

7:7E-3.26 RIPARIAN ZONES

This policy restricts development in riparian zones around regulated waters.

The proposed project would conform to the requirements of flood hazard area permits and therefore would be compatible with this policy.

7:7E-3.27 WETLANDS

This policy restricts disturbance in wetland areas and requires mitigation if wetlands are destroyed or disturbed.

A few of the proposed project areas fall near wetlands. The proposed project will not permanently alter any wetlands. Any disturbances to wetlands will be temporary and returned to the previous state. Where applicable, the proposed project would abide by the Freshwater Wetlands Protection Act Rules. Therefore, the proposed project would be compatible with this policy.

7:7E-3.28 WETLAND BUFFERS

This policy restricts development in wetland buffer areas in order to protect wetlands.

The proposed project would not impact wetland buffers as all construction will occur on current building footprints.

7:7E-3.29 (RESERVED)

7:7E-3.30 (RESERVED)

7:7E-3.31 COASTAL BLUFFS

This policy restricts development on coastal bluffs.

This policy would not be applicable since the proposed project is not located along any coastal bluffs.

7:7E-3.32 INTERMITTENT STREAM CORRIDORS

This policy restricts actions in intermittent stream corridors.

This policy would not be applicable since the proposed project is not located in intermittent stream corridors.

7:7E-3.33 FARMLAND CONSERVATION AREAS

This policy seeks to maintain and protect large parcels of land used for farming for farming or farm dependent uses.
This policy would not be applicable since the proposed project is not located near or on farmland conservation areas.

7:7E-3.34 STEEP SLOPES

This policy seeks to preserve steep slopes by restricting development in such areas.

This policy would not be applicable since the proposed project is not located on steep slopes.

7:7E-3.35 DRY BORROW PITS

This policy restricts the use and provides maintenance of dry borrow pits within acceptable limits.

This policy would not be applicable since the proposed project is not located near nor would it make use of dry borrow pit areas.

7:7E-3.36 HISTORIC AND ARCHAEOLOGICAL RESOURCES

This policy protects the value of historic and archaeological resources and may require cultural resource surveys and other protective measures.

Based on the initial cultural resources assessment, none of the selected individual structures, or group of structures, is eligible for the National Register of Historic Places (NRHP) and there are no previously recorded NRHP eligible or listed sites within the project area. he anticipated level of ground disturbance from elevating the structures is expected to be centered around the existing foundations and within the same boundaries of prior disturbance and therefore is not expected to adversely impact archaeological remains. Therefore, this policy would not be applicable since the proposed project does not include historic and/or cultural resources.

7:7E-3.37 SPECIMAN TREES

This policy seeks to protect specimen trees.

This policy would not be applicable since the proposed project does not contain any known specimen trees.

7:7E-3.38 ENDANGERED OR THREATENED WILDLIFE OR PLANT SPECIES HABITATS

This policy restricts development in endangered or threatened wildlife or vegetation species habitat areas.

A known nesting site of the federally listed (threatened) piping plover (*Charadrius melodus*) is located within 3.5 miles of the proposed project area. There is also a known occurrence of the federally listed (threatened) plant seabeach amaranth (*Amaranthus pumilus*) located within 3.5 miles of the proposed project area. The proposed project activities will be outside of beach habitat and not within areas suitable for threatened and endangered species. USFWS review resulted with the conclusion that the proposed project has no effect on piping plovers and seabeach amaranth.

7:7E-3.39 CRITICAL WILDLIFE HABITATS

This policy discourages development that would adversely affect critical wildlife habitat.

The proposed project would not affect any critical wildlife habitats.

7:7E-3.40 PUBLIC OPEN SPACE

This policy encourages new public open spaces and discourages development that might adversely affect existing public open space.

This policy would not be applicable since the proposed project does not affect public open space.

7:7E-3.41 SPECIAL HAZARD AREAS

This policy discourages development in hazard areas.

This policy would not be applicable since the proposed project does not affect special hazard areas.

7:7E-3.42 EXCLUDED FEDERAL LANDS

Federal lands are beyond the jurisdiction of the New Jersey Coastal Zone. New Jersey has the authority to review activities on Federal lands if impacts may occur in New Jersey's Coastal Zone.

This policy would not be applicable since the proposed project is not on the list of Excluded Federal Lands.

7:7E-3.43 SPECIAL URBAN AREAS

This policy seeks to encourage development that would help to restore the economic and social viability of certain municipalities that receive state aid.

This policy would not be applicable since the proposed project is not located in special urban areas.

7:7E-3.44 PINELANDS NATIONAL RESERVE AND PINELANDS PROTECTION AREA

This policy allows the Pinelands Commission to serve as the reviewing agency for actions within the Pinelands National Reserve.

This policy would not be applicable since the proposed project is not within the Pinelands National Reserve.

7:7E-3.45 HACKENSACK MEADOWLANDS DISTRICT

This policy allows the Hackensack Meadowlands Development Commission to serve as the reviewing agency for actions within the Hackensack Meadowlands District.

This policy would not be applicable since the proposed project is not within the Hackensack Meadowlands District.

7:7E-3.46 WILD AND SCENIC RIVER CORRIDORS

This policy recognizes the outstanding value of certain rivers in New Jersey by restricting development to compatible uses.

This policy would not be applicable since the proposed project is not located in any Wild and Scenic River Corridor.

7:7E-3.47 GEODETIC CONTROL REFERENCE MARKS

This policy discourages the disturbance of geodetic control reference marks.

This policy would not be applicable since the proposed project area does not contain any known geodetic control reference marks.

7:7E-3.48 HUDSON RIVER WATERFRONT AREA

This policy restricts development along the Hudson River Waterfront and requires development, maintenance, and management of a section of the Hudson Waterfront Walkway coincident with the shoreline of the development property.

This policy would not be applicable since the proposed project is not located in the Hudson River Waterfront Area.

7:7E-3.49 ATLANTIC CITY

This policy restricts development within the municipal boundary of the City of Atlantic City.

This policy would not be applicable since the proposed project is not located in Atlantic City.

7:7E-3.50 LANDS AND WATERS SUBJECT TO PUBLIC TRUST RIGHTS

This policy restricts development that adversely affects lands and waters subject to public trust rights.

This policy would not be applicable since the proposed project is not located on lands and waters subject to public trust rights.

SUBCHAPTER 3A – STANDARDS FOR BEACH AND DUNE ACTIVITIES

7:7E-3A.1 STANDARDS APPLICABLE TO ROUTINE BEACH MAINTENANCE

This policy sets standards for routine beach maintenance to include debris removal and clean-up; mechanical sifting and raking; maintenance of accessways; removal of sand from street ends, boardwalks/promenades and residential properties; the repair or reconstruction of existing boardwalks, gazebos and dune walkover structures; and limited sand transfers from the lower beach to the upper beach or alongshore (shore parallel).

This policy would not be applicable since the proposed project would not involve routine beach maintenance.

7:7E-3A.2 STANDARDS APPLICABLE TO EMERGENCY POST-STORM BEACH RESTORATION

This policy sets standards for beach restoration activities, as part of an emergency post-storm recovery.

This policy would not be applicable since the proposed project would not involve any form of beach restoration.

7:7-3A.3 STANDARDS APPLICABLE TO DUNE CREATION AND MAINTENANCE

This policy sets standards and restrictions for dune creation and maintenance projects.

This policy would not be applicable since the proposed project would not involve dune creation and maintenance.

7:7E-3A.4 STANDARDS APPLICABLE TO THE CONSTRUCTION OF BOARDWALKS

This policy sets standards for boardwalk construction to address engineering concerns.

This policy would not be applicable because boardwalks would not be constructed as part of the proposed project.

SUBCHAPTER 3B – WETLAND MITIGATION PROPOSALS

7-7E-3B.1 MITIGATION PROPOSAL REQUIREMENTS

This section details the requirements of a wetland mitigation proposal.

This policy would not be applicable because the proposed project would not impact

wetlands, and therefore does not require any wetland mitigation.

SUBCHAPTER 3C – IMPACT ASSESSMENT FOR ENDANGERED AND THREATENED WILDLIFE

This section details the performance and reporting standards for impact assessments for endangered and threatened wildlife species. If required, based on updated relevant agency correspondence, habitat/impact assessments for endangered and threatened species will conform to the performance and reporting standards listed.

A known nesting site of the federally listed (threatened) piping plover (*Charadrius melodus*) is located within 3.5 miles of the proposed project area. There is also a known occurrence of the federally listed (threatened) plant seabeach amaranth (*Amaranthus pumilus*) located within 3.5 miles of the proposed project area. The proposed project activities will be outside of beach habitat and not within areas suitable for threatened and endangered species. The USFWS review resulted with the conclusion that the proposed project has no effect on piping plovers and seabeach amaranth.

The anticipated level of ground disturbance from elevating the structures would be centered around the existing foundations and within the same boundaries of prior disturbance and therefore would not adversely impact habitat, either directly or through secondary impacts on the relevant site or in the surrounding area. The rebuilding of one residential building would be contained within the property parcel and would minimize disturbance to surrounding vegetation.

SUBCHAPTER 4 – GENERAL WATER AREAS

7:7E-4.2 to 4.22 ACCEPTABILITY CONDITIONS FOR USES

This section set forth the requirements for specific types of development within General Water Areas, which are located below either the spring high water line or the normal water level of non-tidal water.

This policy does not apply since the proposed project would not involve any of the specific types of development listed.

SUBCHAPTER 5 – GENERAL LAND AREAS

This policy sets forth requirements for impervious cover and vegetative cover on sites in the upland waterfront development area and CAFRA areas.

The proposed project would be located in an area designated as CAFRA Urban Lands. The elevation of the structures would remain within the existing footprint of the development. The proposed project is compatible with this policy.

SUBCHAPTER 6 – GENERAL LOCATION RULES

7:7E-6.1 LOCATION OF LINEAR DEVELOPMENT

This policy sets conditions for acceptability of linear development (e.g., roads, walkways, pipelines).

This policy would not be applicable since there is no linear development associated with the proposed project.

7:7E-6.2 BASIC LOCATION

This policy states that the NJDEP may reject or conditionally approve a project for safety, protection of certain property, or preservation of the environment.

The proposed project would involve protecting private property through a non-structural engineering alternative.

7:7E-6.3 SECONDARY IMPACTS

This policy sets the requirements for secondary impact analysis from the effects of additional development likely to be constructed as a result of the approval of a particular proposal.

This policy would not be applicable because the proposed project would not involve additional development.

SUBCHAPTER 7- USE RULES

7:7E-7.2 HOUSING USE

This policy sets standards for housing construction in coastal areas.

The proposed project involves the elevation of residential buildings on the existing footprint. The proposed project would not include new construction or expansion of the existing footprint. The proposed project is compatible with this policy.

7:7E-7.3 RESORT/RECREATIONAL USE

This policy sets standards for resort and recreational uses in the coastal area.

This policy would not be applicable because the proposed project does not involve resort or recreational uses.

7:7E-7.3A MARINA DEVELOPMENT

This policy sets standards for marina development in the coastal area.

This policy would not be applicable since the proposed project does not include marina development.

7:7E-7.4 ENERGY USE

This policy sets standards for energy uses in coastal areas.

This policy would not be applicable because the proposed project does not involve new construction that would require long-term energy use.

7:7E-7.5 TRANSPORTATION USE

This policy sets standards for roads, public transportation, footpaths, and parking facilities in coastal areas.

This policy would not be applicable since the proposed project does not involve construction of roads, public transportation, footpaths, and/or parking facilities.

7:7E-7.6 PUBLIC FACILITY USE

This policy sets standards for public facilities (e.g., solid waste facilities) in coastal areas.

This policy would not be applicable since the proposed project does not involve construction of a public facility.

7:7E-7.7 INDUSTRY USE
This policy sets standards for industrial uses in coastal areas.

This policy would not be applicable because the proposed project does not involve construction of industrial facilities.

7:7E-7.8 MINING USE

This policy sets standards for mining in coastal areas.

This policy would not be applicable because the proposed project does not involve mining.

7:7E-7.9 PORT USE

This policy sets standards for port uses and port-related development.

This policy would not be applicable because the proposed project does not involve port use or the construction of a port.

7:7E-7.10 COMMERCIAL FACILITY USE

This policy sets standards for commercial facilities such as hotels, and other retail services in the coastal zone.

This policy would not be applicable since the proposed project does not involve construction of commercial facilities.

7:7E-7.11 COASTAL ENGINEERING

This policy sets standards to protect the shoreline, maintain dunes, and provide beach nourishment.

This policy would not be applicable because the proposed project is a non-structural alternative that involves the elevation of residential buildings; the proposed project does not involve coastal engineering. This policy would not be applicable to the proposed project.

7:7E-7.12 DREDGED MATERIAL PLACEMENT ON LAND

This policy sets standards for disposal of dredged materials.

This policy would not be applicable since the proposed project does not involve any dredged material placement.

7:7E-7.13 NATIONAL DEFENSE FACILITIES USE

This policy sets standards for the location of defense facilities in the coastal zone.

This policy would not be applicable since the proposed project does not involve national defense facilities.

7:7E-7.14 HIGH RISE STRUCTURES

This policy sets standards for high-rise structures in the coastal zone.

This policy would not be applicable because the proposed project does not involve high-rise structures.

SUBCHAPTER 8 – RESOURCE RULES

7:7E-8.2 MARINE FISH AND FISHERIES

This policy sets standards of acceptability so as to cause minimal feasible interference with the reproductive and migratory fish patterns of estuarine and marine species of finfish and shellfish.

This policy would not be applicable because the proposed project would be limited to the residential property parcels and therefore would have no adverse impact on the natural functioning of marine fish or any New Jersey based marine fisheries.

7:7E-8.3 (RESERVED)

7:7E-8.4 WATER QUALITY

This policy sets standards for coastal development to limit effects on water quality.

Short-term water quality impacts resulting from construction activities are expected and are anticipated to be localized to the vicinity of the residential buildings. No long-term impacts to the offshore or nearshore water quality are anticipated as a result of the proposed project.

7:7E-8.5 SURFACE WATER USE

This policy sets standards for coastal development so as to limit effects on surface water.

Short-term water quality impacts resulting from construction activities are expected and are anticipated to be localized proximal to the footprints of the residential buildings.

7:7E-8.6 GROUNDWATER USE

This policy sets standards for coastal development so as to limit effects on groundwater supplies.

This policy would not be applicable because the proposed project does not involve or effect future use of groundwater supplies.

7:7E-8.7 STORMWATER MANAGEMENT

This policy sets standards for coastal development so as to limit effects of stormwater runoff.

The proposed project would not involve or effect future stormwater management.

7:7E-8.8 VEGETATION

This policy sets standards for coastal development while protecting native vegetation.

The proposed project would preserve, to the maximum extent practicable, existing vegetation within the proposed project area.

7:7E-8.9 (RESERVED)

7:7E-8.10 AIR QUALITY

This policy sets standards for coastal development with requirements that projects must meet applicable air quality standards.

Emissions to construct the proposed project do not exceed threshold levels for any emission variable. As a result, a Clean Air Act “Finding of Non-Applicability” has been assembled. The proposed project would be consistent with this policy since it is not anticipated to increase air emissions above existing levels.

7:7E-8.11 PUBLIC ACCESS TO THE WATERFRONT

This policy requires that coastal development adjacent to the waterfront provide perpendicular and linear access to the waterfront to the extent practicable, including both visual and physical access.

The proposed project involves the elevation of residential buildings within the same existing property lines. The proposed project would not impede public access to the waterfront; therefore, the proposed project is consistent with this policy.

7:7E-8.12 SCENIC RESOURCES AND DESIGN

This policy sets standards that new coastal development be visually compatible with its surroundings.

The proposed project would not affect views of the natural and/or built landscape; therefore, the proposed project is consistent with this policy.

7:7E-8.13 BUFFERS AND COMPATABILITY OF USES

This policy sets standards for adequate buffers between compatible land uses.

The proposed project is compatible with adjacent land uses; therefore, it would be consistent with this policy.

7:7E-8.14 TRAFFIC

This policy sets standards that restrict coastal development that would disturb traffic systems.

The proposed project would make every effort possible to mitigate temporary impacts on traffic during construction. The proposed project would have no permanent effects on traffic; therefore, it is consistent with this policy.

7:7E-8.15 THROUGH 8.20 (RESERVED)

7:7E-8.21 SUBSURFACE SEWAGE DISPOSAL SYSTEMS

This policy sets standards for subsurface sewage disposal systems in the coastal zone.

This policy is not applicable because the proposed project does not involve sewage disposal.

7:7E-8.22 SOLID AND HAZARDOUS WASTE

This policy sets standards for handling and disposal of solid and hazardous waste.

This policy is not applicable because the proposed project does not involve solid and hazardous waste.

APPENDIX C

CLEAN AIR ACT RECORD OF NON-APPLICABILITY

Environmental Analysis Branch
(CENAN-PL-E)

March 2, 2015

RECORD OF NON-APPLICABILITY (RONA)

Project Name: Leonardo, Raritan Bay and Sandy Hook Bay, New Jersey Coastal Storm Risk Management Feasibility Study
Reference: Equipment list and schedule provided by Matthew Voisine (23 Feb 15) to Jenine Gallo via email

Project/Action Point of Contact: Matthew Voisine, 917.790.8718

Begin Date: October 2016

End Date: July 2017

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

2. The requirements of this rule do not apply because the total direct and indirect emissions from this project are significantly less than the 100 tons trigger levels for NO_x, VOC, $PM_{2.5}$, or CO for each project year (40CFR§93.153(b)(1) & (2)). The estimated total NO_x emissions for the project are 23.7 tons for 2016 and 51.3 tons for 2017. VOC, $PM_{2.5,}$ and, CO are significantly lower than the NO_x emission estimates as NO_x is the primary mass criteria pollutant from diesel equipment.

3. The project is presumed to conform with the General Conformity requirements and is exempted from Subpart B under 40CFR§93.153(c)(1).

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

Encl

Emissions have been estimated using project planning information developed by the New York District, consisting of anticipated equipment types and estimates of the horsepower and operating hours of the diesel engines powering the equipment. In addition to this planning information, conservative factors have been used to represent the average level of engine load of operating engines (load factors) and the average emissions of typical engines used to power the equipment (emission factors). The basic emission estimating equation is the following:

$$\mathbf{E = hrs \times LF \times EF}$$

Where:

E = Emissions per period of time such as a year or the entire project.
hrs = Number of operating hours in the period of time (e.g., hours per year, hours per project).
LF = Load factor, an estimate of the average percentage of full load an engine is run at in its usual operating mode.
EF = Emission factor, an estimate of the amount of a pollutant (such as NO_x) that an engine emits while performing a defined amount of work.

In these estimates, the emission factors are in units of grams of pollutant per horsepower hour (g/hphr). For each piece of equipment, the number of horsepower hours (hphr) is calculated by multiplying the engine's horsepower by the load factor assigned to the type of equipment and the number of hours that piece of equipment is anticipated to work during the year or during the project. For example, a crane with a 250-horsepower engine would have a load factor of 0.43 (meaning on average the crane's engine operates at 43% of its maximum rated power output). If the crane were anticipated to operate 1,000 hours during the course of the project, the horsepower hours would be calculated by:

250 horsepower x 0.43 x 1,000 hours = 107,500 hphr

The emissions from diesel engines vary with the age of an engine and, most importantly, with when it was built. Newer engines of a given size and function typically emit lower levels of pollutants than older engines. The NO_x emission factors used in these calculations assume that the equipment pre-dates most emission control requirements (known as Tier 0 engines in most cases), to provide a reasonable "upper bound" to the emission estimates. If newer engines are actually used in the work, then emissions will be lower than estimated for the same amount of work. In the example of the crane engine, a NO_x emission factor of 9.5 g/hphr would be used to estimate emissions from this crane on the project by the following equation:

$$\frac{\mathbf{107{,}500\ hphr \times 9.5\ g\ NO_x/hphr}}{\mathbf{453.59\ g/lb \times 2{,}000\ lbs/ton}} = \mathbf{1.1\ tons\ of\ NO_x}$$

As noted above, information on the equipment types, horsepower, and hours of operation associated with the project have been obtained from the project's plans and represent current best estimates of the equipment and work that will be required. Load factors have been obtained from various sources depending on the type of equipment. Marine engine load factors are primarily from a document associated with the New York and New Jersey Harbor Deepening Project (HDP): "Marine and Land-Based Mobile Source Emission Estimates for the Consolidated Schedule of 50-Foot Deepening Project, January 2004," and from EPA's 1998 Regulatory Impact Analysis (RIA): "EPA Regulatory Impact Analysis: Control of Commercial Marine Vessels." Land-side nonroad equipment load factors are from the documentation for EPA's NONROAD emission estimating model, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA420-P-04-005, April 2004."

Emission factors have also been sourced from a variety of documents and other sources depending on engine type and pollutant. The NO_x emission factors for marine engines have been developed primarily from EPA documentation for the Category 1 and 2 standards (RIA, "Control of Emission from Marine Engines, November 1999) and are consistent with emission factors used in documenting emissions from the HDP, while the VOC emission factors for marine engines are from the Port Authority of New York and New Jersey's "2010 Multi-Facility Emissions Inventory" which represent the range of marine engines operating in the New Jersey harbor and coastal region in terms of age and regulatory tier level. Nonroad equipment NO_x emission factors have been derived from EPA emission standards and documentation, while the nonroad VOC emission factors have been based on EPA's Diesel Emissions Quantifier (DEQ, accessed at: *www.epa.gov/cleandiesel/quantifier/*), run for moderately old equipment (model year 1995). On-road vehicle emission factors have also been developed from the DEQ, assuming a mixture of Class 8, Class 6, and Class 5 (the smallest covered by the DEQ) on-road trucks.

As noted above, the emission factors have been chosen to be moderately conservative so as not to underestimate project emissions. Actual project emissions will be estimated and tracked during the course of the project and will be based on the characteristics and operating hours of the specific equipment chosen by the contractor to do the work.

The following pages summarize the estimated emissions of pollutants relevant to General Conformity, NO_x, VOC, $PM_{2.5}$, SO_2, and CO in sum for the project and by calendar year based on the schedule information also presented (in terms of operating months per year). Following this summary information are project details including the anticipated equipment and engine information developed by the New York District, the load factors and emission factors as discussed above, and the estimated emissions for the project by piece of equipment.

USACE - New York District
Leonardo Project
Equipment Emission Summary
25 February 2015
DRAFT

Emission Source Type	tons NO_x	VOC	SO_x	$PM_{2.5}$	CO
Emissions per Structure					
Off-road equipment emissions	0.58	0.01	0.0003	0.01	0.07
On-road vehicle emissions	2.42	0.13	0.0020	0.12	0.74
Total emissions per structure	3.00	0.15	0.0023	0.13	0.81
Emissions for 25 Structures					
Off-road equipment emissions	14.5	0.3	0.008	0.2	1.8
On-road vehicle emissions	60.5	3.4	0.050	3.1	18.4
Total emissions per 25 structures	**75.0**	**3.7**	**0.058**	**3.3**	**20.2**
Emissions per Calendar Year					
Emissions in CY 2016	23.7	1.2	0.018	1.0	6.4
Emissions in CY 2017	51.3	2.5	0.040	2.3	13.8
Total emissions per 25 structures	**75.00**	**3.7**	**0.058**	**3.3**	**20.2**

Based on:

Schedule dated Jan. 2015	Duration
Project Start Oct 2016	3.0 months
Project Complete July 2017	6.5 months
Total Duration	9.5 months

USACE - New York District
Leonardo Project
Equipment Emission Estimates
25 February 2015
DRAFT

Description, off-road equipment	Category	Horsepower (approx.)	Load Factor	Hours	hphrs	grams per hphr* NO$_x$	grams per hphr* VOC	grams per hphr* SO$_x$	grams per hphr* PM$_{2.5}$	grams per hphr* CO	tons NO$_x$	tons VOC	tons SO$_x$	tons PM$_{2.5}$	tons CO
Air compressor	Compressor	100	0.43	38.4	1,651	9.5	0.19	0.0050	0.16	1.21	0.017	0.000	0.0000	0.000	0.00
Air compressor	Compressor	100	0.43	143.1	6,152	9.5	0.19	0.0050	0.16	1.21	0.064	0.001	0.0000	0.001	0.01
Compactor, rammer	Other diesel engines	250	0.59	38.4	5,664	9.5	0.19	0.0050	0.16	1.21	0.059	0.001	0.0000	0.001	0.01
Compactor, rammer	Other diesel engines	250	0.59	38.4	5,664	9.5	0.19	0.0050	0.16	1.21	0.059	0.001	0.0000	0.001	0.01
Compactor, vibroplate	Other diesel engines	250	0.59	46.0	6,792	9.5	0.19	0.0050	0.16	1.21	0.071	0.001	0.0000	0.001	0.01
Compactor, vibroplate	Other diesel engines	250	0.59	46.0	6,792	9.5	0.19	0.0050	0.16	1.21	0.071	0.001	0.0000	0.001	0.01
Concrete vibrator	Other diesel engines	7.5	0.59	131.4	582	9.5	0.19	0.0050	0.16	1.21	0.006	0.000	0.0000	0.000	0.00
Concrete vibrator	Other diesel engines	7.5	0.59	131.4	582	9.5	0.19	0.0050	0.16	1.21	0.006	0.000	0.0000	0.000	0.00
Loader, front end, wheel, articulated	Rubber tired loader	110	0.59	7.2	464	9.5	0.19	0.0050	0.16	1.21	0.005	0.000	0.0000	0.000	0.00
Loader, front end, wheel, articulated	Rubber tired loader	110	0.59	7.2	464	9.5	0.19	0.0050	0.16	1.21	0.005	0.000	0.0000	0.000	0.00
Loader, front end, wheel, articulated	Rubber tired loader	175	0.59	20.0	2,065	9.5	0.19	0.0050	0.16	1.21	0.022	0.000	0.0000	0.000	0.00
Loader, front end, wheel, articulated	Rubber tired loader	175	0.59	20.0	2,065	9.5	0.19	0.0050	0.16	1.21	0.022	0.000	0.0000	0.000	0.00
Loader, front end, wheel, articulated	Rubber tired loader	175	0.59	15.8	1,627	9.5	0.19	0.0050	0.16	1.21	0.017	0.000	0.0000	0.000	0.00
Loader, front end, wheel, skid steer	Rubber tired loader	110	0.59	42.9	2,781	9.5	0.19	0.0050	0.16	1.21	0.029	0.001	0.0000	0.000	0.00
Loader, front end, wheel, skid steer	Rubber tired loader	110	0.59	42.9	2,781	9.5	0.19	0.0050	0.16	1.21	0.029	0.001	0.0000	0.000	0.00
Loader/backhoe, wheel	Rubber tired loader	110	0.59	3.8	249	9.5	0.19	0.0050	0.16	1.21	0.003	0.000	0.0000	0.000	0.00
Loader/backhoe, wheel	Rubber tired loader	135	0.59	3.8	306	9.5	0.19	0.0050	0.16	1.21	0.003	0.000	0.0000	0.000	0.00
Loader/backhoe, wheel	Rubber tired loader	110	0.59	72.9	4,731	9.5	0.19	0.0050	0.16	1.21	0.050	0.001	0.0000	0.001	0.01
Roller, vibratory, towed, single drum, smooth	Other diesel engines	250	0.59	2.6	381	9.5	0.19	0.0050	0.16	1.21	0.004	0.000	0.0000	0.000	0.00
Roller, vibratory, towed, single drum, smooth	Other diesel engines	250	0.59	2.6	381	9.5	0.19	0.0050	0.16	1.21	0.004	0.000	0.0000	0.000	0.00
Tractor, crawler (dozer)	Crawler tractor	250	0.59	1.3	188	9.5	0.19	0.0050	0.16	1.21	0.002	0.000	0.0000	0.000	0.00
Tractor, crawler (dozer)	Crawler tractor	250	0.59	10.3	1,521	9.5	0.19	0.0050	0.16	1.21	0.016	0.000	0.0000	0.000	0.00
Tractor, crawler (dozer)	Crawler tractor	250	0.59	10.3	1,521	9.5	0.19	0.0050	0.16	1.21	0.016	0.000	0.0000	0.000	0.00
Totals					**55,403**						**0.58**	**0.01**	**0.00**	**0.01**	**0.07**

* Emission factors consistent with NAN ABU emission estimates and documented with that work.

Description, on-road vehicles	Category	Hours	Miles	grams per mile** NO$_x$	grams per mile** VOC	grams per mile** SO$_x$	grams per mile** PM$_{2.5}$	grams per mile** CO	tons NO$_x$	tons VOC	tons SO$_x$	tons PM$_{2.5}$	tons CO
Dump truck, highway, 75,000 lbs	Class 8 diesel truck	20	700	29.7	1.0	0.017	1.3	7.3	0.023	0.001	0.0000	0.001	0.01
Dump truck, highway, 75,000 lbs	Class 8 diesel truck	20	700	29.7	1.0	0.017	1.3	7.3	0.023	0.001	0.0000	0.001	0.01
Truck, flatbed, 8' x 16'	Class 6 diesel truck	50	1,750	20.6	1.2	0.017	1.1	6.3	0.040	0.002	0.0000	0.002	0.01
Truck, flatbed, 8' x 16'	Class 6 diesel truck	719	25,164	20.6	1.2	0.017	1.1	6.3	0.572	0.032	0.0005	0.030	0.17
Truck, flatbed, 8' x 16'	Class 6 diesel truck	719	25,164	20.6	1.2	0.017	1.1	6.3	0.572	0.032	0.0005	0.030	0.17
Truck , highway, 25,000 lbs	Class 6 diesel truck	50	1,750	20.6	1.2	0.017	1.1	6.3	0.040	0.002	0.0000	0.002	0.01
Truck , highway, 25,000 lbs	Class 6 diesel truck	719	25,164	20.6	1.2	0.017	1.1	6.3	0.572	0.032	0.0005	0.030	0.17
Truck , highway, 25,000 lbs	Class 6 diesel truck	719	25,164	20.6	1.2	0.017	1.1	6.3	0.572	0.032	0.0005	0.030	0.17
Truck , highway, conventional, 8,800 lbs	Class 6 diesel truck	10	350	20.6	1.2	0.017	1.1	6.3	0.008	0.000	0.0000	0.000	0.00
Totals		**3,026**	**105,907**						**2.42**	**0.13**	**0.00**	**0.12**	**0.74**

On-road truck activity assume travel at 35 mph average, conservative 1995 MY trucks

** Emission factors estimated from EPA's Diesel Emission Quantifier. While not valid for SIP work, provides close approximation for these project-level estimates.
Based on 1995 model year vehicles in CY 2015 to provide conservatively high emission estimates.
The exception is SOx EFs which are taken from the PANYNJ 2012 emissions inventory report for heavy-duty diesel vehicles

USACE - New York District
Leonardo Project
Equipment Emission Estimates
25 February 2015
DRAFT

Land-side Equipment Types	Load Factor
Backhoe	21%
Booster pump	43%
Compactor	43%
Compressor	43%
Concrete saw	59%
Conveyor	43%
Crane	43%
Crawler tractor	59%
Dozer	59%
Drilling rig	43%
Excavator	59%
Forklift	59%
Generator	43%
Grader	59%
Light plants	43%
Off-road truck	59%
Other diesel engines	59%
Pump	43%
Rubber tired loader	59%
Screen	43%
Skid Steer Loader	21%
Winch	43%

APPENDIX D

CLEAN WATER ACT 404(B)(1) EVALUATION REPORT

1. GENERAL DESCRIPTION OF FILL MATERIAL

A. General Characteristics of Material

N/A

B. Quantity of Material

N/A

C. Source of Material

N/A

2. DESCRIPTION OF PROPOSED DISCHARGE SITE

A. The Selected Plan is will not discharge any materials in the water. and is fully described in the EA.

B. Time and duration of disposal/fill placement

N/A

C. Description of disposal/fill placement methods:

N/A

3. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

1) Elevation

   N/A

2) Sediment type

   N/A

3) Dredged/fill material movement

   N/A

4) Physical effects on benthos

   N/A

5) Other effects

   N/A

6) Actions taken to minimize impacts

   N/A

B. Water Circulation, Fluctuation and Salinity Determinations

1) Water Quality
    a. Salinity: N/A
    b. pH: N/A
    c. Clarity: N/A
    d. Color: N/A
    e. Odor: N/A
    f. Taste: N/A
    g. DO: N/A
    h. Nutrients: N/A
    i. Eutrophication: N/A
    j. Others as appropriate: None
2) Current Pattern and Circulation:
    a. Current pattern and flow: N/A
    b. Velocity: N/A
    c. Stratification: N/A
3) Normal Water Level Fluctuations:

    The proposed project will not affect the 100-year floodplain.
4) Salinity Gradients

    N/A
5) Actions Taken to Minimize Impacts:

    N/A

C. Suspended Particulate/Turbidity Determinations

1) Expected changes in suspended particulates and turbidity levels in the vicinity of construction sites

    N/A
2) Chemical and physical properties of the water column

    N/A
3) Biota

    N/A
4) Actions taken to minimize impacts

    N/A

D. Contaminant Determinations

N/A

E. Aquatic Ecosystem and Organism Determinations

1) Effects on plankton

   No impacts are anticipated

2) Effects on nekton

   No impacts are anticipated

3) Effects on benthos

   No impacts are anticipated

4) Effects on aquatic food web

   No impacts are anticipated

5) Effects on Special Aquatic Sites

   a. Sanctuaries and Refuges: N/A
   b. Wetlands: N/A
   c. Mud flats: N/A
   d. Vegetated shallows: N/A
   e. Intertidal and subtidal: N/A

4. FINDING OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS OF DISCHARGE

A. No significant adaptations of the guidelines were made relative to this evaluation.

B. The proposed action does not appear to violate applicable state water quality or effluent standards.

C. Since there is no fill material placement proposed, the Toxic Effluent Standards of Section 307 of the Clean Water Act will not be violated.

D. The proposal will have no adverse impact on threatened or endangered species or their critical habitats (Endangered Species Act of 1973).

E. The proposal will have no impact on marine sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.