South Shore of Staten Island
Validation Report
Final Draft

Appendix B
National Environmental Policy Act
Memorandum for the Record:
SSSI Environmental Reevaluation

January 2024

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Appendices

1 Preface

This Memorandum for the Record (MFR) was prepared in accordance with Section 13(d) of Engineer Regulation (ER) 200-2-2, Procedures for Implementing the National Environmental Policy Act (NEPA), (USACE, 1988) and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] Parts 1500-1508). This section will describe impact changes and any compliance updates since the South Shore of Staten Island (SSSI) Coastal Storm Risk Management (CSRM) Feasibility Study's Record of Decision (ROD) was signed in 2016.

The conditions, project description, and environmental effects described in the Final Environmental Impact Statement (FEIS) are still valid. The purpose of this MFR is to document compliance of the proposed project design refinements with the existing FEIS. Supplementation of the FEIS is not required per 40 CFR 1502.9(d) because substantial changes to the proposed action (which includes the design changes to the seawall, in addition to design refinements that have occurred during the PED phase to the NED Plan) have not occurred nor do the changes have significant bearing on the findings of the FEIS.

The proposed action was evaluated and compared to the FEIS. A summary assessment of the potential effects of the proposed action are listed in Table 1. The effects of the proposed action on each resource category are discussed in depth in Section 5 of this MFR.

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☐	☐	☒
Aquatic resources/wetlands	☐	☒ [1]	☐
Coastal Zone Management	☐	☐	☒
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☐	☐	☒
Cultural resources	☒	☐	☐
Hazardous, toxic & radioactive waste	☐	☐	☒
Land use	☐	☐	☒
Noise levels	☒	☐	☐
Socioeconomics and Environmental justice	☒	☐	☐
Geology, Topography, and Soils	☒	☐	☐
Transportation	☐	☐	☒
Water resources	☒	☐	☐
Recreation	☒	☐	☐

Table 1: Summary of potential effects of proposed action

[1]*Wetland resources are considered self-mitigation, and no compensatory mitigation is required.*

No significant effects were identified in this evaluation and no compensatory mitigation is required.

2 Background

The SSSI CSRM Project FEIS was completed in December 2016 (available online) to meet the requirements of the NEPA and to demonstrate that the recommended plan (hereafter referred to as the NED Plan) is compliant with all applicable environmental laws, regulations, and policies. A ROD was signed on 8 December 2016 (available online).

Changes to the authorized plan described in the Director's Report occurred during the Pre-construction, Engineering, and Design (PED) phase of the SSSI project based on engineering analysis completed to date. These analyses include updated geotechnical information, updated water level, wave data, and the latest coastal engineering analyses, including physical modeling and probabilistic overtopping analysis per updated design guidance. The recommended design changes to the authorized plan are hereafter referred to as the proposed action.

It was determined through coordination with the Vertical Team, that a MFR be drafted to document the environmental review of the proposed action. This MFR documents that the proposed action continues to be covered by the existing 2016 FEIS and ROD by examining the changes between the NED Plan and the proposed action and evaluating any differences in effects against what was analyzed in the 2016 NEPA documents. The project as described in the FEIS is considered the baseline against which any differences in the environmental effects brought about by the changes documented in the Validation Report will be evaluated in this document.

Language from the FEIS has been incorporated throughout the MFR. This language is shown in a different font to indicate that it has been copied from the FEIS, as shown: "Example text from the FEIS".

3 Purpose and Need, Authorization, Study Area, and Proposed Action

3.1 Purpose and Need of MFR

The purpose and need of the SSSI project have not changed from what was described in the FEIS (see FEIS Section 1; USACE 2016a). The project purpose and need are also described in the Executive Summary of the Validation Report.

The purpose of the impact reevaluation documented in this MFR is to determine whether the analysis documented in the FEIS covers the proposed action and remains valid for decision making. This reevaluation focuses on current designs, their changes from feasibility, and their effects on the project, resources, and the environment. Analysis conducted in the FEIS are summarized where appropriate and are incorporated by reference.

The need for this impact reevaluation is to determine whether the environmental impacts of the proposed action are the same or lesser than those described in the FEIS, or if the proposed action results in environmental impacts greater than those described in the FEIS. This MFR will conclude with a determination on whether additional NEPA documentation is required.

3.2 Study Authority

The study was authorized by a resolution of the U.S. House of Representatives Committee on Public Works and Transportation and adopted May 13, 1993. The resolution states that:

> *"The Secretary of the Army, acting through the Chief of Engineers, is requested to review the report of the Chief of Engineers, on the Staten Island Coast from Fort Wadsworth to Arthur Kill, New York, published as House Document 181, Eighty-ninth Congress, First Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of beach erosion control, storm damage reduction, and related purposes on the South Shore of Staten Island, New York, particularly in and adjacent to the communities of New Dorp Beach, Oakwood Beach, and Annadale Beach, New York."*

The feasibility study was completed and approved in 2016 using funds provided through the American Recovery and Reinvestment Act of 2009 and the Disaster Relief Appropriations Act of 2013 (hereinafter, P.L. 113-2). P.L. 113-2 provides the authority for 100% federal funding for the completion of coastal storm risk management studies that were underway as of October 29-30, 2012 (Hurricane Sandy) and provides eligibility to initiate project construction. A Director's Report (2016) prepared in compliance with the applicable requirements of P.L. 113-2 demonstrated that the project is economically justified, technically feasible, and environmentally acceptable, and that it incorporates resiliency, sustainability, and consistency with the North Atlantic Coast Comprehensive Study (NACCS).

The authorized project addresses the most critical and vulnerable portion of the authorized study area from Fort Wadsworth to Oakwood Beach. The remainder of the authorized study area from Great Kills to Tottenville was evaluated separately and did not result in a recommendation for construction.

Authorization to construct the project using P.L. 113-2 funds was also provided through the Disaster Relief Appropriations Act of 2013. Chapter 4 of P.L. 113-2 authorizes USACE "For an additional amount for "Construction" for necessary expenses related to the consequences of Hurricane Sandy, $3,461,000,000, to remain available until expended to rehabilitate, repair and construct United States Army Corps of Engineers projects: Provided, That $2,902,000,000 of the funds provided under this heading shall be used to reduce future flood risk in ways that will support the long-term sustainability of the coastal ecosystem and communities that reduce the economic costs and risks

associated with the large-scale flood and storm events in areas along the Atlantic Coast within the boundaries of the North Atlantic Division of the Corps that were affected by Hurricane Sandy..."

Chapter 4 of P.L. 113-2, also provides "That upon approval of the Committees on Appropriations of the House of Representatives and the Senate these funds may be used to construct any project under study by the Corps for reducing flooding and storm damage risks in areas along the Atlantic Coast within the North Atlantic Division of the Corps that were affected by Hurricane Sandy and that the Secretary determines is technically feasible, economically justified, and environmentally acceptable."

The Water Resources Development Act of 2022 (WRDA 2022) provided further authorization for the project, as described below.

> Sec 8401. Project Authorizations. Authorizes projects to be carried out substantially in accordance with the plans, and subject to the conditions, described in the respective reports or decision documents designated in this section. This section authorizes the South Shore of Staten Island project for construction, based upon the October 27, 2016, Chiefs (Directors) Report at a total cost of $1,671,000,000, with a Federal Cost of $1,086,000,000 and a Non-Federal cost of $585,000,000.
>
> Sec 8148. Advance Payment in Lieu of Reimbursement for Certain Federal Costs. This Section of WRDA 2022 identified the South Shore of Staten Island as a project where the Federal government is authorized to advance the Federal share of funds required for acquisition of LERRD's and performance of relocations, when these costs are projected to exceed the non-Federal share of the cost of the project.

3.3 Study Area Description

The study area has not changed from the FEIS, see Figure 1 below. The study area is described in Section 1.5 of the FEIS (USACE 2016a).

Source: USACE 2016

Figure 1: SSSI Study Area, as presented in the 2016 FEIS

4 Plan Formulation

The NED Plan and proposed action are summarized and compared below. The plans are described by contract area: Seawall, Floodwall, Levee, Area C, Area E, Area B, Tidal Wetland/Mosaic of Habitats. Following each contract description is a list of design changes that have occurred within the contract area, since the publication of the FEIS.

Section 2.5 of the FEIS (USACE 2016a) or Section 7 of the Final Feasibility Report (available online; USACE 2016b) provide a detailed description of the NED Plan.

4.1 Comparison of the NED Plan (as in the FEIS) and the Proposed Action (in the MFR)

4.1.1 Seawall (Oakwood Beach to Miller Field and Midland Beach to Fort Wadsworth)

FEIS Description:

The seawall feature is presented as a red polygon and labelled ‘A4’ in Figure 2. Typical cross sections of both the boardwalk and promenade reaches are shown in Figure 3 and Figure 4. The following description has been copied from Section 2.5.1 of the FEIS:

"A buried seawall would be used for Reach A-4, which spans the majority of the LOP from Fort Wadsworth to Oakwood Beach. The crest elevation of the buried seawall would be 20.5 feet NGVD29 [19.4 ft. NAVD88]. The buried seawall would be located on the existing dune system or landward of the existing dune system. No components or elements of the project would be located or would be constructed seaward of the existing dune system. The buried seawall would consist of a trapezoidal-shaped core structure with a 10-foot wide crest and a side slope of 1.5 H:V. The core would be constructed with two-stone thickness armor stone and bedding stone layers. A 10-foot wide scour apron would be incorporated into the seaside structure toe. The entire core structure would be covered with backfill, with compacted fill placed on the seaward face and landward face to support grass and other native beach vegetation. Geotextile fabric would be placed underneath the bedding layer to reduce settlement, and around the core structure to minimize loss of fill through the voids. The backfill would be placed on 2:1 (H:V) side slopes with dune grass plantings to provide additional stabilization of the seaward face during less intense storm events. A vertical steel sheet pile wall would be installed in the interior of the structure to prevent seepage (USACE 2016).

The buried seawall would incorporate a promenade replacing the continuous at-grade paved and pile-supported promenade from Miller Field to Oakwood Beach. Roller compacted concrete would be constructed atop the crest to create a 17-foot wide paved promenade. From Miller Field to Fort Wadsworth, the buried seawall would provide for a 38-foot width boardwalk atop the proposed seawall. The boardwalk would be a functional equivalent to the existing boardwalk." (USACE 2016a).

Source: USACE 2016

Figure 2: Overview of the line of protection, as presented in the FEIS.

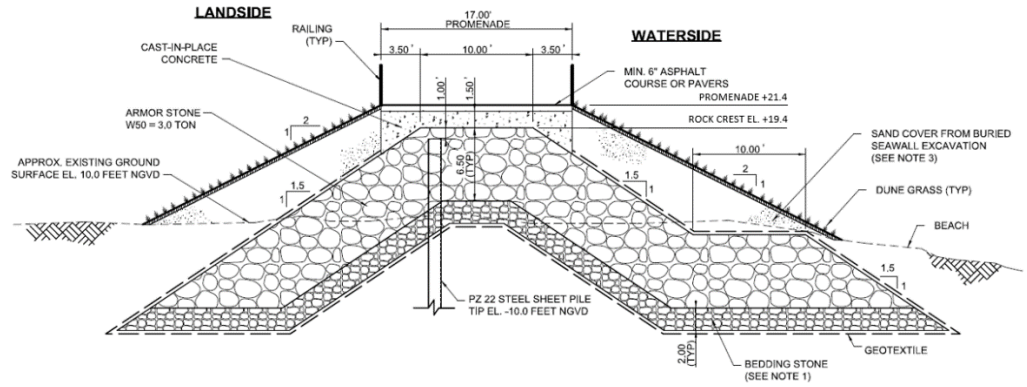

Figure 3: Typical buried seawall cross-section of the promenade reach from Oakwood Beach to Miller Field, as presented in the FEIS.

Note: The FEIS description uses NGVD29 to describe elevations. The elevations in the above figure are shown in NAVD88.

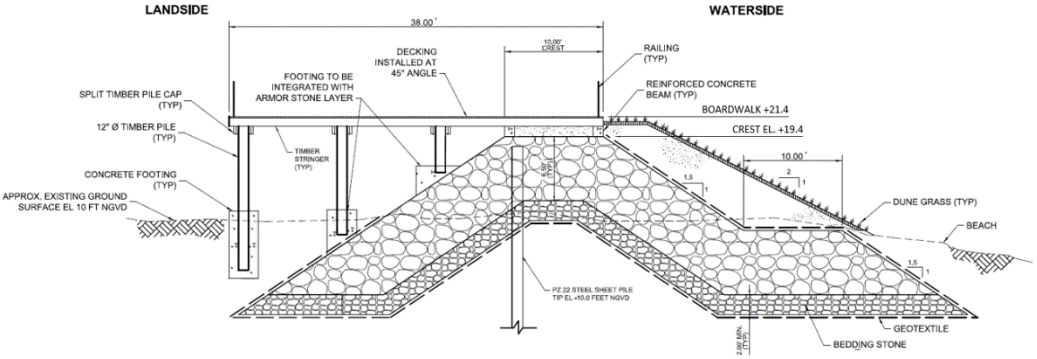

Figure 4: Typical buried seawall cross-section of the boardwalk reach from Midland Beach to Fort Wadsworth, as presented in the FEIS.

Note: The FEIS description uses NGVD29 to describe elevations. The elevations in the above figure are shown in NAVD88.

Proposed Action:

The promenade section of the seawall (from Oakwood Beach to Miller Field) is comprised of two parallel sheet pile walls connected by a reinforced concrete cap with a top elevation of +21.4 ft. NAVD88 [or +22.5 ft. NGVD29] (Note: The increase in elevation does not increase the total height of the seawall, instead it integrates the promenade/boardwalk and brings the rock crest up to the total height presented in the FEIS). The sheet pile walls are 27 ft. apart and the space between them is filled with compacted granular sand fill. Construction of a scour and overtopping rock reduction berm with 5-ton armor stone, a wide flat berm at +21.4 ft. NAVD88. The armor stone will be placed over an underlayer, bedding stone, and geotextile in a configuration like that described in the FEIS. A typical cross-section of the proposed action's promenade is shown in Figure 5.

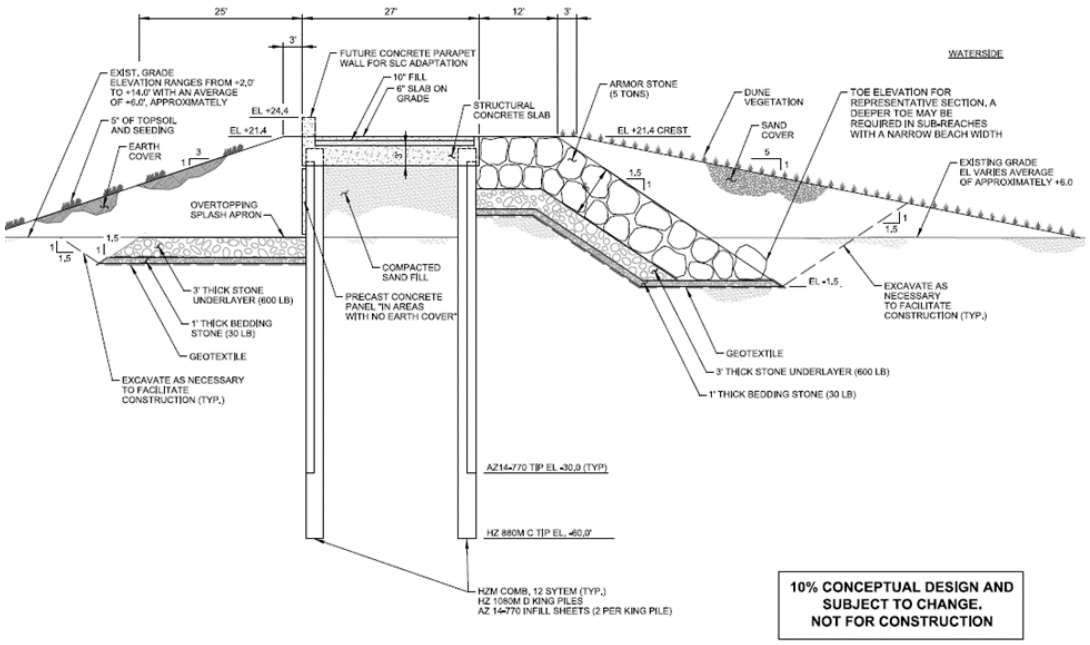

Figure 5: Proposed action seawall promenade reach from Oakwood Beach to Miller Field

The boardwalk section of the seawall (from Midland Beach to Fort Wadsworth) is constructed similarly to the promenade section described above, with 38 feet between the sheet pile walls instead of 27 feet as in the promenade. A typical cross-section of the proposed action's boardwalk is shown in Figure 6.

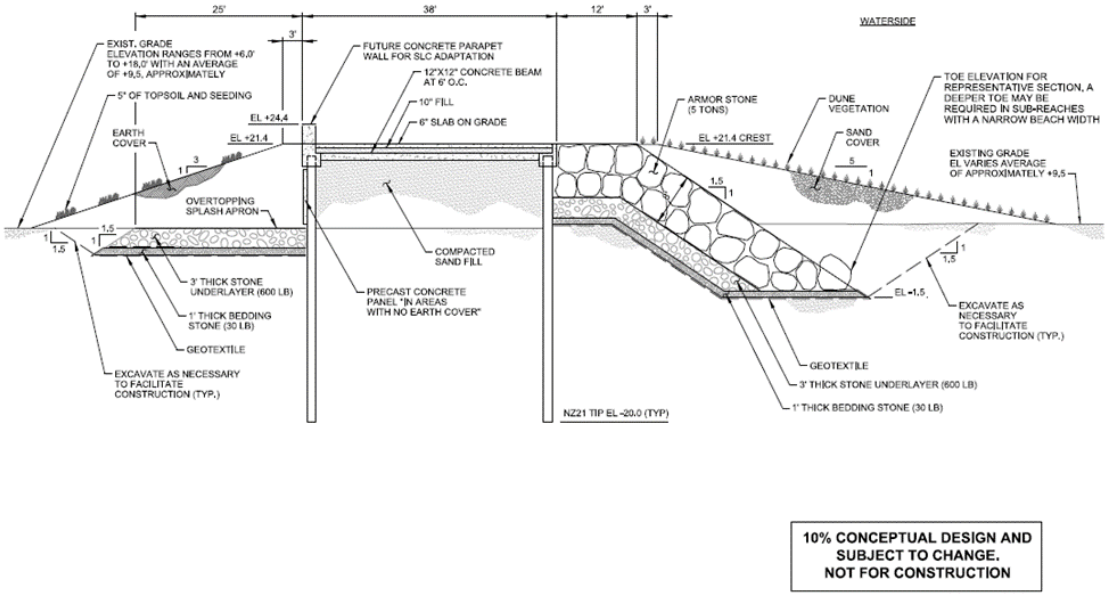

Figure 6: Proposed action seawall boardwalk reach from Midland Beach to Fort Wadsworth.

The footprints of the feasibility level seawall design and the proposed action were compared in GIS. A general depiction comparing the footprints is shown in Figure 7, for more detail reference Appendix B.

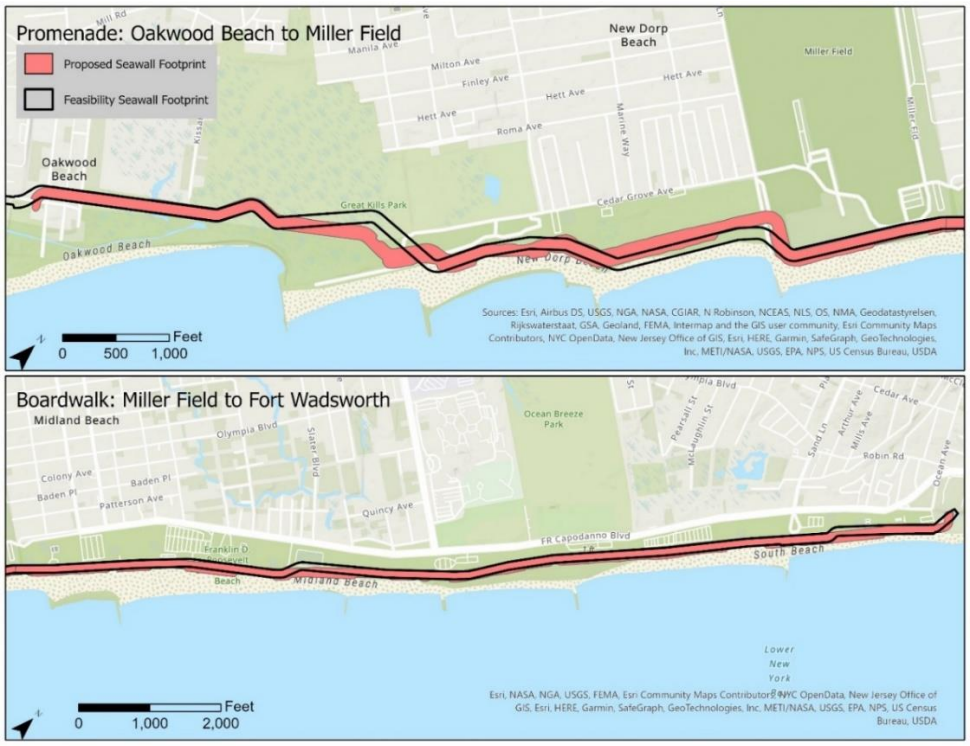

Figure 7: General depiction of the seawall footprint under feasibility level design and proposed action.

<u>Design refinements to the NED Plan:</u>

- Change In seawall section from buried rock armored levee with 1.5:1 side slope and a single vertical steel sheet pile wall to a double row of sheet pile with fill in between and rock protection.
    - Why? Larger wave conditions and physical model tests resulted in changes to the buried rock seawall section and a significant cost increase. An alternative double sheet pile section was developed and shown to be the least cost option. The double sheet pile relies less on large size armor stone and steel strength and more on the mass of fill contained between two rows of sheet pile connected with concrete beams working as a gravity structure to resist the design surge and wave loads.
- Promenade width increased from 17 feet to 27 feet.
- Flattened slopes on landside (3:1) and water side (5:1). In the FEIS side slopes were 2:1. These slopes were flattened to reduce maintenance.
- Slight realignment of the seawall from FEIS.

    - Why? Due to actual sewer interceptor and outfall locations and to maintain beach width.
- Rock crest elevation raised from +19.4 to +21.4 feet NAVD88.
    - Why? To maintain overtopping performance per updated wave inputs and physical model results. Overall height of project is unchanged at +21.4 feet NAVD88. During feasibility, the +19.4 feet NAVD88 rock crest elevation was topped by the timber boardwalk or concrete promenade for an overall height of +21.4 feet NAVD88. The now recommended double sheet pile section has a concrete cap crest elevation of +21.4 feet NAVD88, which has an auxiliary function as a boardwalk/promenade. Because the cap is integral to the function of the wall, it is not considered a betterment over the timber boardwalk and concrete promenade from feasibility phase.
- Armor stone size increased from 3 tons to 5 tons based on updated wave and physical models.
- Removed 3-ton rock slope on the back side of the seawall and replaced with 600-pound splash apron.
- Decrease in the total rock weight required for construction. The total rock weight in the FEIS was 860K tons and in the PED phase the total rock weight for the buried rock seawall design had increased to 1,320K tons. This has now decreased under the double sheet pile designs of the proposed action to 786K tons.
- Surcharge program, wick drains, and strip drains to offset the long-term settlement due to soft soil layers (identified in 2019/20, post-Director's Report).

4.1.2 Floodwall

FEIS Description:

The floodwall is presented as a green line and labelled 'A3' in Figure 2. The following description has been copied from Section 2.5.1 of the FEIS.

> "A reinforced concrete floodwall would be used for Reach A-3 where a reduced footprint would be necessary to minimize impacts to the Oakwood Beach WWTP. The floodwall design would consist of a pile-supported T-wall with a top wall elevation of 20.5 ft. NGVD29 [19.4 ft. NAVD88] (USACE 2016).
>
> The floodwall footing would be designed to accommodate localized jet scour by defining a 3-foot-thick base that would be set 2 feet below grade. In addition, a rock blanket would extend 25 feet landward from the concrete footing to provide adequate overtopping jet scour protection. A vertical steel sheet pile wall would be included beneath the wall to prevent seepage below the footing." (USACE 2016a)

Proposed Action:

The floodwall is 2,112 feet long and extends along the western and southern sides of the Oakwood Beach wastewater treatment plant (WWTP). The floodwall consists of 1,569 feet of steel H-pile supported T-shaped concrete floodwall with an integrated steel sheet pile seepage wall at a crest elevation of +19.4 feet NAVD88 [or +20.5ft. NGVD29]. Along the western perimeter of the WWTP, there would be 543 feet of I-wall consisting of a steel sheet pile wall with concrete cap with a crest elevation of +17.4 feet NAVD88 [or +18.5 ft. NGVD29]. A stone scour blanket will be installed along the bayside of the floodwall and consist of two layers of 600-pound armor stone supported by a layer of 30-pound bedding stone. A splash pad, approximately 15 feet wide and 4 feet deep, would be installed along the landward side of the floodwall to provide protection from overtopping. The footprints of the feasibility level design and the proposed action for the floodwall were compared in GIS. Reference Appendix B for a detailed comparison of both footprints.

Design refinements to the NED Plan

- Increased the length of the floodwall from 1,800 feet to 2,100 feet to accommodate future NYCDEP effluent pump station.
- Changed 543 feet of T-wall to concrete capped I-wall
- The I-wall section's crest elevation was lowered from +19.4 feet to +17.4 feet NAVD88.
- Updated USACE guidance requires consideration of an "Extreme" load combination (an event expected to have an AEP of 0.133% or less) and barge impact loads.
- Approximately 55% more armor stone was added along the western side of the WWTP.
- Approximately 2.5x the weight of steel for pile foundations is required to accommodate higher loads, weaker soils, and 100-year service life.
- A sludge force main was relocated to provide room for the floodwall.
- Special monoliths were required for additional drainage and utility crossings.

4.1.3 Levee

FEIS Description:

The levee is presented as a blue line and labelled 'A1' and 'A2' in Figure 2. The following description has been copied from Section 2.5.1 of the FEIS.

> "The levee proposed for Reach A-1 and Reach A-2 would tie in the LOP to high ground. The levee would have a crest elevation of 18 feet NGVD29 [16.9 ft NAVD88]. The levee would consist of compacted impervious fill that would extend a minimum of 6 feet below the existing ground surface to prevent seepage. Common fill would be placed at a 2.5:1 (H:V) slope (e.g., a height of 2.5 for every 1 foot of vertical) to stabilize the core and provide a solid basis for vegetation. The proposed design would have a crest width of 10-feet; however, the A-2 levee

section to the east of the proposed tide gate structure would be increased to 15-foot wide to permit maintenance vehicle access to the tide gates." (USACE 2016a).

Proposed Action:

Under the proposed action, the levee is designed with a crest elevation of +16.9 feet NAVD88 [or +18 ft. NGVD29] and a side slope of 3:1. The levee would be constructed to a height of +17.7 feet NAVD88 [or 18.8 ft. NGVD29], to account for long-term settlement. The crest width would be 10 feet along the entire length of the levee. Deep stripping of 1.5-3 feet of soil would be necessary to remove *Phragmites* root mat from the levee footprint. High-Performance Turf Reinforcement Mat (HTRM) would be installed on the landside of the levee. The toe of the levee on both the landside and bayside would be armored with rip rap below +3.5 feet NAVD88 [or 4.6 ft NGVD29] as scour protection.

The footprints of the feasibility level design and the proposed action for the levee were compared in GIS. This comparison is shown in Appendix B.

Design refinements to the NED Plan

- Crest elevation of the levee was raised from +16.9 to +17.7 feet NAVD88, to offset long-term settlement due to clay layers.
- The crest width changed from 10-15 feet in the FEIS, to 10 feet along the entire length of the levee.
- Side slopes were flattened from 2.5:1 to 3:1 to facilitate maintenance and to meet USACE guidance.
- Addition of DMM foundation support for approximately 700 feet of levee due to deep clay layers and to provide stable construction access for the tide gate.
- Staged construction to allow for short-term settlement of clay layers.
- Addition of rip rap toe scour protection on the bayside below +3.5 feet NAVD88.
- Addition of a knee wall south of the tide gate to avoid loading on utility pipes.
- HTRM slope stability moved from the bayside to the landside of the levee.
- Addition of paved access road and turn arounds/maintenance access at the tide gate.
- Relocation of sludge force main to avoid crossing under the line of protection.
- Relocation of Storm Drain to drain into Pond Area A to avoid crossing under the line of protection.
- Replacement of existing 30" sludge force main crossing under the levee due to its age and unknown condition.

    Design refinements to the NED Plan specific to the levee tide gate

    - Crest elevation of the tide gate increased from +16.9 to +19.9 feet NAVD88 for future sea level change.
    - Additional foundation piles added due to the soft soils.
    - Addition of sheet pile cutoff.

- Addition of landside emergency gates.
- Change from slide gate to combination slide-flap gate on the bayside.

4.1.4 Hylan Boulevard Closure Structure

FEIS Description:

The following description has been copied from Section 2.5.1 of the FEIS.

> "At Hylan Boulevard, a closure structure would be used to close the roadway as needed to prevent floodings from severe storm events. The structure, which would be approximately 106 feet long and 4 to 4.5 feet high, would be supported by a concrete foundation (consisting of a series of footings located within the roadway adjacent to each lane of traffic, along with footings located in the center median and each side of the Hylan Boulevard). During a flood event, removable posts would be installed within the roadway, and the closure structure would be installed within the frame/guide. Nine spans would allow the closure structure to be staged and tested, precluding a full closure of Hylan Boulevard prior to actual use." (USACE 2016a).

Proposed Action:

The Hylan Boulevard closure structure has not changed from that described in the FEIS. This feature is not discussed further in this MFR.

4.1.5 Area B

FEIS Description:

The FEIS level design for Area B is presented in Figure 8. The following description has been copied from Section 2.4.4 of the FEIS.

> "The minimum facility for Drainage Area B includes a tide gate on pond to control the inflow to and outflow from the drainage area. It would be constructed to elevation 2.5 NGVD29 [or 1.4 ft NAVD88] with the same features as the tide gate in Area A, but with slight variations in dimension. New chambers containing flap and sluice gate would also be added at the existing Ebitts Street, New Dorp Lane, and Tysens Lane outfalls. The minimum facility would also include a road raising along Mill Road to an elevation of approximately 7.1 feet NGVD29 [or 6 ft. NAVD88] and Kissam Avenue to an elevation of approximately 7.1 feet NGVD29. The Mill Road raising would disallow the spillover of floodwater from Drainage Area A to Drainage Area B, while the Kissam road raising would provide vehicle access to the buried seawall/armored levee during storm events." (USACE, 2016a).

Figure 8: Feasibility level design for Area B, as presented in the FEIS.

Proposed Action:

Area B includes the excavation of one pond (47.9 acres). The pond perimeter is graded to the existing grade from +1.65 NAVD88 [or 2.75 ft. NGVD299] with 4:1 side slopes. Two tide gates are proposed (see list of design refinements for Area B below), the additional tide gate will facilitate drainage of area B1, consistent with the FEIS. A maximum 4-foot depth micro pool is located at the tide gate structure. Figure 9 shows the design plan for Area B under the proposed action.

Figure 9: Design plan for Area B under the proposed action.

Design refinements to the NED Plan

- Acreage of the excavated pond increased from 46 to 48 acres because of detailed design grading with a current survey.
- Eliminated the need to raise Mill Road and Kissam Avenue due to more robust modeling conducted in PED.
- Addition of a relief diversion structure on Tysens Lane outfall to allow water to divert into the pond.
- Addition of second tide gate to allow pond area B1 to drain directly into the creek.

4.1.6 Area C

FEIS Description:

The FEIS level design for Area C is shown in Figure 10. The following description has been copied from Section 2.4.4 of the FEIS.

> "The minimum facility for Drainage Area C includes four new gate chambers (Greeley, Midland, Naughton and Seaview Avenues) below the proposed LOP and the acquisition and preservation of the currently available freshwater wetland areas for a total natural storage area of 120.44 acres. The proposed property acquisitions are consistent with the properties identified as part of the Bluebelt plan. A section of Seaview Avenue would be raised to an elevation of +10 feet NGVD29 [or 8.9 ft NAVD88] in the area of Quincy Avenue to Father Capodanno Blvd to prevent potential overland flow from the adjacent interior Drainage Area D into Drainage Area C for all frequency events. Ditches or drains would be

constructed along the landward side of the buried seawall/armored levee system to direct runoff toward all outlets."

In addition to the minimum facility plan, the design for Area C "includes seven excavated ponds located along Seaview Avenue, Father Capodanno Boulevard, Midland Avenue and Hylan Boulevard to provide 377,200 cubic yards of additional storage (USACE 2016). The proposed ponds in Drainage Area C are consistent with one of the ponds proposed for the Bluebelt Program." (USACE 2016a).

Figure 10: Feasibility level design plan for Area C, as presented in the FEIS.

Proposed Action:

The design plan for Area C under the proposed action is shown in Figure 11. Area C includes the excavation of 3 ponds (41 acres). The ponds will be graded to -1 foot NAVD88 [or 0.1 ft NGVD29] at the lowest point.

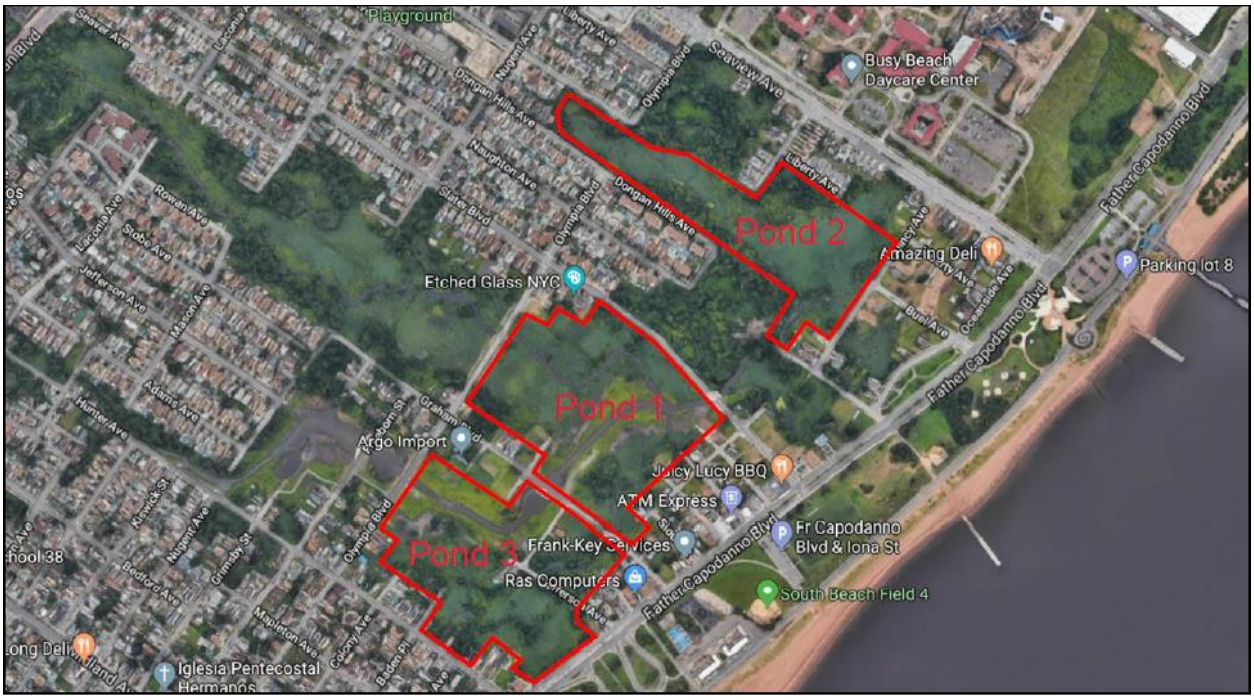

Figure 11: Design plan for Area C under the proposed action.

Design refinements to the NED Plan

- PED-level decision for USACE to construct ponds 1-3. As agreed by the Non-Federal Sponsor and NYC, NYC is taking responsibility for the construction of the ponds above Olympia Boulevard as a part of their Bluebelt initiative. However, to facilitate a proper comparison to the FEIS, the impacts of the upper ponds are considered in this document for several resources (i.e., soils, wetland acre impacts).
- Eliminated the need to raise a portion of Seaview Avenue based on more robust modeling conducted in PED.

4.1.7 Area E

FEIS Description:

The FEIS level design plan is shown in Figure 12. The following description of Area E has been copied from Section 2.4.4 of the FEIS.

> "The minimum facility plan for Drainage Area E (see Figure 2-6) includes on new gate chamber at Sand Lane below the planned Line of Protection and the acquisition and preservation of 46.7 acres of available natural storage." (USACE 2016a).

In addition to the minimum facility plan, the FEIS design plan for Area E includes the excavation of two ponds (34 acres) to provide 227,720 cubic yards of storage.

Figure 12: Feasibility level design for Area E, as presented in the FEIS.

Proposed Action:

The proposed action for Area E includes the excavation of 3 ponds (38.6 acres): SBE-1A, SBE-1B, and SBE-1C. The perimeter of the ponds (at +3.5 feet NAVD88 [or 4.6 ft NGVD29] will be graded up to existing grades with 3:1 side slopes. The ponds will be graded to -0.66 feet NAVD88 [or 0.44 ft NGVD29] with sloping bottoms for shallow water depths required to maintain wetland plantings. At the centerline, the ponds will be graded down to -2.00 feet NAVD88 [or -0.9 ft NGVD29]. The average water depth of the ponds is expected to be 18 inches. Two micro-pools with 3 feet of permanent water will be located at the drainage structures at Quintard Street and Father Capodanno Blvd. Ponds SBE-1A and SBE-1B will be connected by a 580-foot-long channel with a depth of 5.5 feet, a bottom width of 4 feet, and side slopes of 3:1. The proposed action designs are shown in Figure 13.

Figure 13: Design plans for Area E under the proposed action.

Design refinements to the NED Plan

The following design changes for Area E resulted from the partner/NYC request to incorporate the NYCDEP Bluebelt designs.

- Changed from 2 ponds (34 acres) to 3 ponds (38.6 acres) to align with the NYCDEP Bluebelt designs.
- The pond bottom was lowered to -2 NAVD88 to align with the NYCDEP Bluebelt designs and to allow for the installation of storm sewer inlets.
- Addition of a 580-foot-long channel between SBE-1A and SBE-1B to equalize water surface elevations in the two ponds.
- Addition of junction chambers, weir chambers, and inlets to align with NYCDEP drainage plans.

4.1.8 Tidal Wetland/Mosaic of Habitats

FEIS Description:

A 46-acre mosaic of habitats was proposed in the FEIS. The tidal wetland/mosaic of habitats consisted of 13 acres of low marsh, 6 acres of high marsh, 7 acres of scrub/shrub, 3 acres of maritime forest, and 17 acres of dune grass. The preliminary design presented in the FEIS is shown in Figure 14.

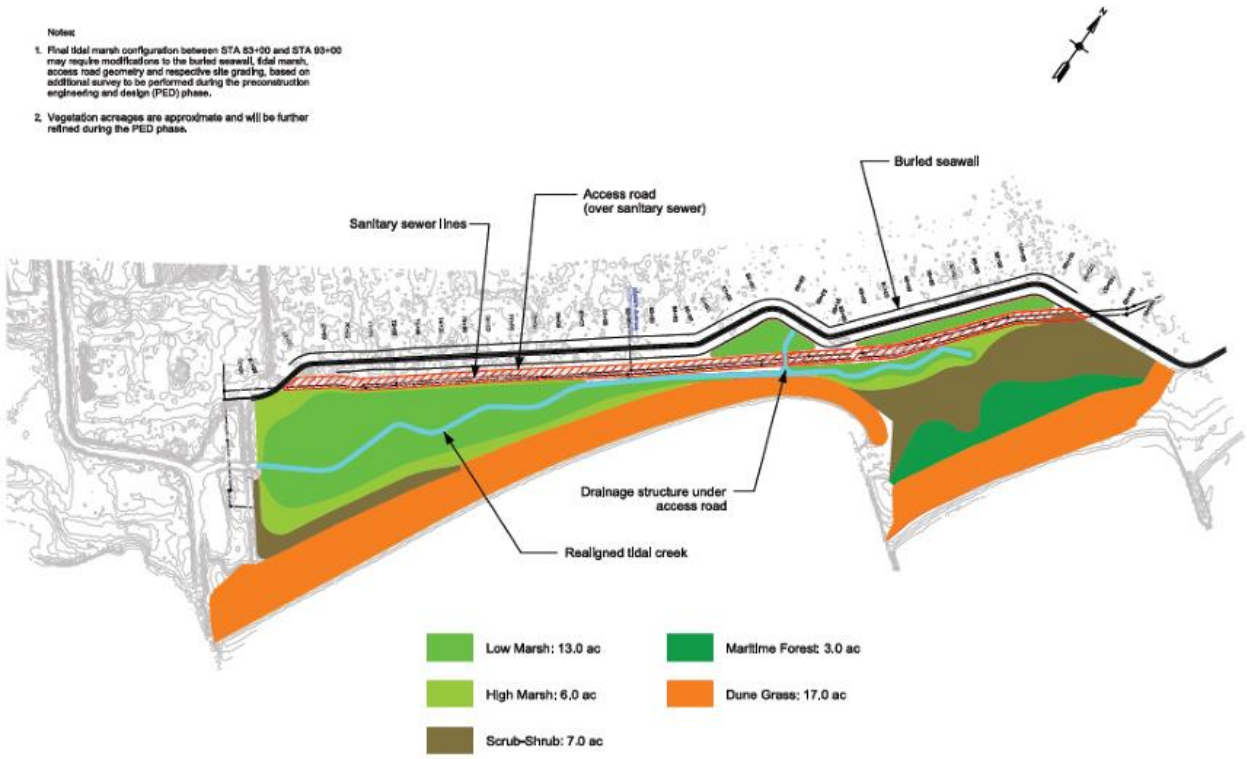

Figure 14: Preliminary mosaic of habitats design as presented in the FEIS.

Proposed Action:

The tidal wetlands/mosaic of habitats consists of 21.7 acres under the proposed action. The habitats to be constructed in the mosaic include low and high marsh, tidal creek, intertidal mudflat, salt shrub, maritime shrubland, maritime forest, and scrub-shrub. The design under the proposed action is shown in Figure 15.

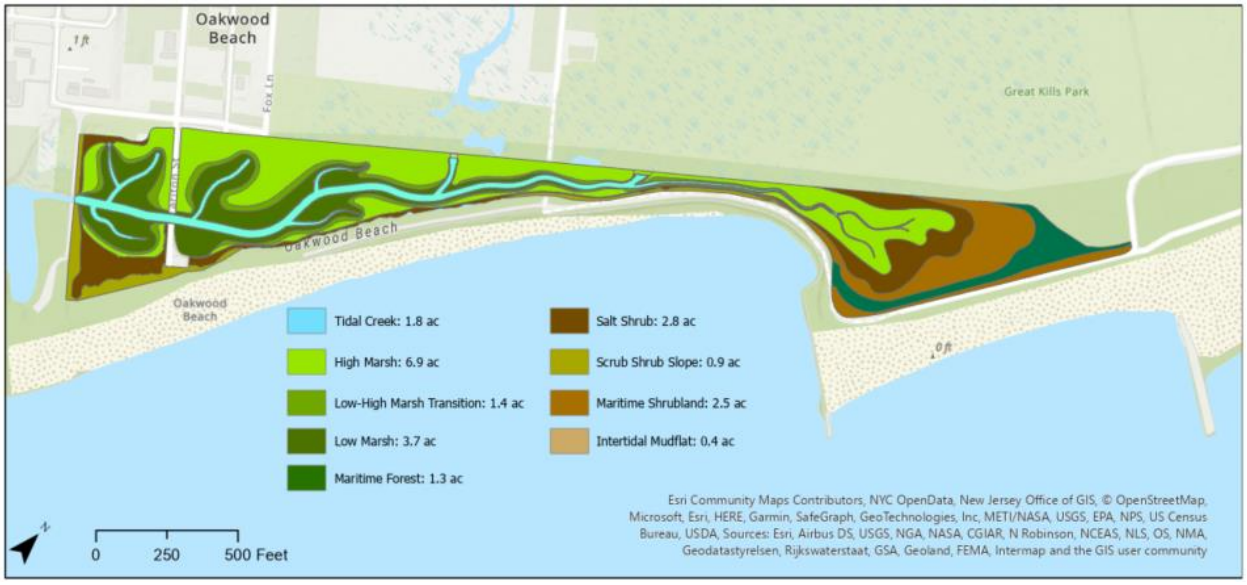

Figure 15: Tidal wetland/mosaic of habitats design under the proposed action

Design refinements to the NED Plan

- The overall acreage of the tidal wetland/mosaic of habitats has decreased from 46 acres to 21.7 acres. Of the 46 acres, 17 acres of dune grass plantings were removed from designs due to the decision to leave the existing trap bags and rock along Oakwood Beach in place and to not cover the trap bags in sand. The remaining 29 acres decreased to 21.7 due to realignment of the seawall to parallel the actual location of the existing sewer interceptors, and maintaining Tarlton Street.

4.2 Other Changes

4.2.1 Operations and Maintenance

Overall, the cost and effort associated with operations and maintenance of the project will not be changed. The type of project features, list of materials to be used in construction, and standard operating procedure for operations and maintenance that was originally scoped in the FEIS, are essentially the same as that which was considered in feasibility.

4.2.2 Duration of construction

In the FEIS, the total construction duration for multiple construction contracts was estimated to take 3-4 years (nominally March 2019 – June 2022) and the contracts were to be completed concurrently. A CSRA was conducted for the double sheet pile seawall to develop a cost estimate suitable for cost certification. As part of the CSRA, a revised construction schedule was produced. Under the revised schedule, construction for all construction contracts is estimated to take approximately 8.5 years (nominally January 2024 – July 2032) and the contracts are to be constructed consecutively.

This construction duration estimate now includes contingency, while the estimate produced for the FEIS did not. Additional logistical considerations such as HTRW cleanup prior to construction were accounted for in the updated construction schedule estimates and not in the FEIS estimates. These refinements and additional considerations have extended the duration of construction by 4.5 years. However, with the implementation of BMPs, the total long-term direct adverse impacts are anticipated to be the essentially the same as described in the 2016 FEIS and would not require additional environmental analysis.

4.2.3 Disposal Areas and Stockpile locations

Disposal areas were not discussed in the FEIS. It was expected that the construction contractor would be responsible for transporting and disposing of excavated material to an approved disposal site. This expectation remains under the proposed action.

Since the same or similar types of materials (i.e., rock, sheet pile, concrete) and construction methods will be used to construct the double sheet pile, the design refinements related to staging, access roads, stockpiles, and crossovers are within the range of effects analyzed in the FEIS.

Staging areas were identified for construction of the line of protection in the plan sheets of the Recommended Plan (available online). The preliminary plan sheets for the proposed action seawall show the same staging areas identified in the FEIS. The levee, floodwall, and interior drainage areas will utilize additional staging areas identified in PED. NYSDEC and various NYC agencies review the location of the staging areas for each contract area as a part of review and development of the design plans.

4.2.4 Access Areas

The following description of pedestrian and vehicular access was copied from Section 2.5.1 of the FEIS.

> "Three types of access points would be provided along the LOP: maintenance vehicle access, combined truck and pedestrian access, and pedestrian access. Maintenance vehicle access would be provided at one location on Reach A-2 and at four locations along Reach A-4 (between New Dorp Beach and Oakwood Beach) to provide vehicular access to the tide gate and stormwater outfall structures. These ramp sections would be designed to allow maintenance vehicles to access the sluice gates in the drainage structures from above. (USACE 2016).
>
> An additional nine earthen ramps are proposed between Oakwood Beach and South Beach. These ramps would be designed for both pedestrian and vehicular access and meet the 1:12 maximum slope required by *Americans with Disabilities Act (ADA)* guidelines. The ramps would be strategically located to provide beach access from existing roads and access paths. Pedestrian access points, spaced approximately every 500 feet, would be located along the Buried Seawall between Midland Beach and South Beach. Each access point would be comprised of 10-foot-wide reinforced concrete stairs on both the landward and seaward sides of the buried seawall to provide access to the promenade and the beach (USACE 2016).
>
> The buried seawall crest elevation would exceed the existing deck elevation for the Ocean Breeze fishing pier. The pier segments nearest to the promenade would need to be reconstructed to ramp up to the promenade at 1:12 maximum slope required by ADA guidelines (USACE 2016)." (USACE 2016a).

Pedestrian and vehicular access areas are discussed further in Sections 5.9 and 5.13 of this MFR.

4.3 Items Not Carried Forward in Analysis

Several design changes that have occurred since the FEIS have been determined to have no impact to resources and will therefore not be discussed further in this document. Those design changes, and the justification for screening them from additional assessment, are listed below by contract area.

<u>Seawall (Oakwood Beach to Miller Field and Midland Beach to Fort Wadsworth:</u>

- Replaced 3-ton rock slope on back side with 600-pound rock splash apron

- *Justification for screening:* The splash apron does not significantly increase the landward footprint of the seawall. This was determined through geospatial comparison of the NED plan and the proposed action (see Appendix B). The overall change to the seawall footprint was considered in the analysis of impacts to wetlands. This design change will not be individually assessed further in this document.

- Decrease in total rock weight from the FEIS.
  - *Justification for screening:* The total rock weight in feasibility was 860K tons for the NED Plan. In PED, the total rock weight for the buried seawall was 1,320K tons. The proposed action's double sheet pile design requires 786K tons of rock. This is a significant decrease in the amount of rock needed for the PED-level NED plan design. As the total rock weight of the proposed action is less than the total rock weight of the NED Plan, as described in the FEIS and refined in PED, it follows that the design change will have lesser impacts than described in the FEIS. This design change will not be further assessed in this document.

- Surcharge program, wick drains, and strip drains added.
  - *Justification for screening:* The surcharge program, wick drains, and strip drains will be added underneath the seawall structure in the proposed action to aid in the settling of the structure. These drains will be in the same footprint as the seawall and do not add an additional footprint. Thus, this design change will not be further assessed in this document.

Floodwall:

- Changed 543 feet of T-wall to concrete capped I-wall
  - *Justification for screening:* The footprint of the NED plan T-wall and the footprint of the proposed action I-wall were compared in GIS and determined not to be significantly different (see Appendix B). As this portion of the floodwall is within the same footprint, no additional impacts beyond those documented in the FEIS are expected. Thus, this design change will not be further assessed in this document.

- I-wall section crest elevation lowered from +19.4 to +17.4 feet NAVD88.
  - *Justification for screening*: The floodwall feature in the NED plan had a crest elevation of +19.4 feet NAVD88, as described in the FEIS. In the proposed action, the I-wall section of the floodwall feature has a lowered crest elevation of +17.4 feet NAVD88. As the crest elevation of the proposed action is less than that described in the FEIS, this design change will not be further assessed in this document.

- Extreme event (750 YR) and barge impact design per updated guidance.

- *Justification for screening*: The extreme event and barge impact load calculations do not result in a significantly increased structure footprint of the floodwall. In the FEIS, the overall width of the floodwall was 32 feet. In the proposed action, the overall width of the floodwall (including scour and splash aprons) is 33 feet. The increase of the footprint by 1 foot was determined to be insignificant. The overall change to the floodwall footprint was accounted for in the wetland analysis. This design change will not be individually assessed further in this document.

Levee:

- Crest width changed from 10-15 feet to 10 feet along entire length of levee.
  - *Justification for screening:* The change in levee crest width to 10 feet along the entire length of the levee is less than the crest width of 10-15 feet assessed in the FEIS. This decrease in width would result in a decrease in impacts identified in the FEIS, and thus this design change will not be further assessed.

- HTRM slope stability moved from bayside to landside of levee.
  - *Justification for screening:* HTRM slope stability was proposed on the bayside of the levee as a part of the NED plan. During PED, the HTRM was instead proposed for the landside of the levee. The bayside HTRM was changed to rip rap (assessed separately in this document). HTRM is a standard best management practice for preventing erosion on the levee. No impacts to any resource are anticipated because of HTRM installation, and thus this design change is not assessed further.

Area C:

- Eliminated the need to raise a portion of Seaview Avenue
  - *Justification for screening:* In the FEIS, a portion of Seaview Avenue was to be raised to control spillover of interior stormwater collection. The impacts identified in the FEIS associated with this road raising (soil disturbance, private properties, transportation) would not occur under the proposed action as no road raisings are included. No adverse impacts are expected from the removal of the road raising from the proposed action, and thus is not assessed further.

Area B:

- Eliminated the need to raise Mill Road and Kissam Avenue.
  - *Justification for screening:* In the FEIS, portions of Mill Road and Kissam Avenue were to be raised to control spillover of interior stormwater collection. The impacts identified in the FEIS associated with the road raisings (soil disturbance, transportation) would not occur under the proposed action, as no road raisings are included. No adverse impacts are

expected from the removal of the road raisings from the proposed action, and thus is not assessed further.

5 Existing Conditions and Environmental Impacts

The following tables summarize the design changes of each contract and their impacts to each resource category (see Table 2, Table 3, Table *4*, and Table 5). The tables do not include design changes that were screened out. These impacts are discussed in depth in the following sections. Impacts are assigned to one of the following categories:

- N/A – Not applicable, no impact identified.
- De minimis – Impact of very minor significance and falls within the range of impacts assessed in the FEIS.
- Minimal – The design change results in an additional impact to the resource but is not considered significant or is mitigated to a lesser impact.
- Significant – Major impact; the design change results in an additional impact to the resource and results in an additional cumulative impact to the resource.
- Beneficial – The design change results in a beneficial impact to the resource and the cumulative impacts to the resource.

Potential Impacts of Design Changes															
Design Change	***Resource from the FEIS.***														
	Geology, Topography, and Soils (Sec 5.1.3)	Water Resources (Sec 5.2.3)	Vegetation and Wetlands (Sec 5.3.3)	Wildlife (Sec 5.4.3)	Threatened and Endangered Species (Sec 5.5.3)	Socioeconomics and Environmental Justice (Sec 5.6.3)	Cultural Resources (Sec 5.7.3)	Land Use and Zoning (Sec 5.8.3)	Recreation (Sec 5.9.3)	Aesthetic/ Visual (Sec 5.10.3)	Coastal Zone Management (Sec 5.11.3)	HTRW (Sec 5.12.3)	Transportation (Sec 5.13.3)	Air Quality (Sec 5.14.3)	Noise (Sec 5.15.3)
Seawall (Oakwood to Miller Field and Midland to Fort Wadsworth)															
Change from buried rock seawall to double sheet pile design	Minimal	N/A	N/A	N/A	N/A	De minimis	De minimis	N/A	De minimis	De minimis	N/A	N/A	N/A	N/A	De minimis
Flattened side slopes from 2:1 to 3:1 on the landside and to 5:1 on the water side.	Minimal	De minimis	Minimal	Minimal/ Minor Beneficial	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Slight realignment of seawall from FEIS	Minimal	De minimis	Minimal	N/A	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rock crest elevation increased from +19.4 to +21.4 NAVD88	Minimal	De minimis	Minimal	N/A	N/A	De minimis	De minimis	N/A	De minimis	De minimis	N/A	N/A	N/A	N/A	De minimis
Armor stone size increase	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	N/A	De minimis
Promenade width increase to 27 feet	Minimal	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	N/A	N/A
Floodwall at WWTP															
Increase length from 1,800 to 2,100 linear feet	Minimal	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
~55% more armor stone along western side of OBWWTP	N/A	N/A	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis

Table 2: Impacts of Design Changes of the Seawall and Floodwall contracts

Design Change	*Resource from the FEIS.*														
	Geology, Topography, and Soils (Sec 5.1.3)	Water Resources (Sec 5.2.3)	Vegetation and Wetlands (Sec 5.3.3)	Wildlife (Sec 5.4.3)	Threatened and Endangered Species (Sec 5.5.3)	Socioeconomics and Environmental Justice (Sec 5.6.3)	Cultural Resources (Sec 5.7.3)	Land Use and Zoning (Sec 5.8.3)	Recreation (Sec 5.9.3)	Aesthetic/ Visual (Sec 5.10.3)	Coastal Zone Management (Sec 5.11.3)	HTRW (Sec 5.12.3)	Transportation (Sec 5.13.3)	Air Quality (Sec 5.14.3)	Noise (Sec 5.15.3)
Floodwall at WWTP															
2.5x weight of steel for pile foundation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis
Relocated sludge force main	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional drainage and utility crossings require special monoliths	Minimal	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Levee															
Crest elevation raised from +16.9 to +17.7 feet NAVD88	Minimal	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	n/a
Flattened side slopes from 2.5:1 to 3:1	Minimal	De minimis	Minimal	Minimal/ Minor Beneficial	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Addition of DMM foundation support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Staged construction	N/A	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis
Added rip rap scour protection below +3.5 NAVD88	Minimal	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Added knee wall south of tide gate	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Added access road and access at tide gate	Minimal	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3: Impacts of Design Changes of the Floodwall and Levee contracts

Design Change	*Resource from the FEIS.*														
	Geology, Topography, and Soils (Sec 5.1.3)	Water Resources (Sec 5.2.3)	Vegetation and Wetlands (Sec 5.3.3)	Wildlife (Sec 5.4.3)	Threatened and Endangered Species (Sec 5.5.3)	Socioeconomics and Environmental Justice (Sec 5.6.3)	Cultural Resources (Sec 5.7.3)	Land Use and Zoning (Sec 5.8.3)	Recreation (Sec 5.9.3)	Aesthetic/ Visual (Sec 5.10.3)	Coastal Zone Management (Sec 5.11.3)	HTRW (Sec 5.12.3)	Transportation (Sec 5.13.3)	Air Quality (Sec 5.14.3)	Noise (Sec 5.15.3)
Levee															
Relocated sludge force main	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Relocated drainage line	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Replaced sludge force main	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Levee Tide Gate															
Crest elevation raised from +16.9 to +19.9 feet NAVD88 for future SLC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis	N/A	N/A	N/A	N/A	N/A
Additional foundation piles	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis
Sheet pile cutoff added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	De minimis
Added landside emergency gates	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	n/a
Bayside gate changed from slide gate to combination slide-flap gate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Area C Ponds															
PED decision for USACE to construct only ponds 1-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 4: Impacts of Design Changes of the Levee, Levee Tide Gate, and Area C contracts

Design Change	*Resource from the FEIS.*														
	Geology, Topography and Soils (Sec 5.1.3)	Water Resources (Sec 5.2.3)	Vegetation and Wetlands (Sec 5.3.3)	Wildlife (Sec 5.4.3)	Threatened and Endangered Species (Sec 5.5.3)	Socioeconomics and Environmental Justice (Sec 5.6.3)	Cultural Resources (Sec 5.7.3)	Land Use and Zoning (Sec 5.8.3)	Recreation (Sec 5.9.3)	Aesthetic/ Visual (Sec 5.10.3)	Coastal Zone Management (Sec 5.11.3)	HTRW (Sec 5.12.3)	Transportation (Sec 5.13.3)	Air Quality (Sec 5.14.3)	Noise (Sec 5.15.3)
Area E Ponds															
Change from two ponds (34 acres) to 3 ponds (38.6 acres)	De minimis	N/A	Beneficial	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pond bottom lowered to -2 NAVD88	De minimis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
580-ft-long channel added between ponds	De minimis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional junction chambers, weir chambers, inlets added	De minimis	N/A	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Area B Pond															
Acreage changed from 46 to 48 acres	De minimis	De minimis	Beneficial	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Added relief diversion structure on Tysens Lane Outfall	De minimis	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Added second tide gate	De minimis	De minimis	Minimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tidal Wetland Mosaic of Habitats															
Area decreased to 21.7 acres due to location of sewer interceptor, access road construction, realignment of LOP, and decision not to remove Cedar Grove Avenue	De minimis	N/A	De minimis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 5: Impacts of Design Changes of the Area E, Area B, and Tidal Wetland/Mosaic of Habitats contracts

5.1 Geology, Topography, and Soils

5.1.1 Existing Conditions

Section 3.1 of the FEIS describes the existing geology, topography, and soil conditions within the project area.

5.1.1.1 Changes in the Existing Conditions

Geotechnical investigations conducted during the PED phase to support detailed design found the presence of deep clay layers along the entire project length from Oakwood Beach to Fort Wadsworth. Updated topographical maps show reduced beach width along some critical areas (e.g., New Dorp) of the project alignment.

5.1.2 FEIS Impacts

Section 4.1 of the FEIS discusses the impacts of the NED plan to geology, topography, and soil resources within the project area. The FEIS concluded that:

> "Construction activities would disturb approximately 243 acres (LOP: 51 acres; excavated ponds: 188 acres; road raisings: 4 acres). Impacts on geology, topography, and soils from construction activities are expected to be minimal." (USACE 2016a).

5.1.3 Proposed Action Impacts

Several design changes led to different feature footprints than those assessed in the FEIS. The design changes that contributed to a change in footprint were included in the assessment of impacts to geology, topography, and soil. Design changes associated with the levee tide gate and interior drainage Area C did not contribute to a change in footprint and are not discussed further for this resource.

The footprint of the proposed action was measured in GIS to determine the number of acres disturbed in construction. Construction of the proposed action would disturb approximately 276 acres (LOP: 82 acres; excavated ponds: 194 acres). This increase in impacts is largely due to the expanded footprint of the seawall because of the increase in crest elevation and flattened side slopes.

The map series in Appendix B of this MFR compares the footprint of the NED plan to the proposed action. The expanded footprint would disturb the same soil types as in the NED plan and documented in the FEIS: sandy soils (beach habitat) and wetlands. No additional soil types would be impacted by the proposed action. The impacts to wetland habitats and land use from the expanded seawall footprint are considered and discussed in Sections 5.3.3 and 5.8.3 respectively. There is a quantitative increase in the impacts to soils because of the proposed action's seawall, however the qualitative impacts remain the same and are within the range of impacts assessed in the FEIS. Therefore, the design changes associated with the seawall are considered to have minimal impacts to soil resources (see Table 6).

Seawall	**Design Change**	Change from a buried rock seawall to a double sheet pile design	Flattened side slopes from 2:1 to 3:1 on land side and to 5:1 on water side.	Slight realignment of seawall from FEIS	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Promenade width increase to 27 feet	Armor stone increased from 3 tons to 5 tons
	Impact	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal

Table 6: Impacts to geology, topography, and soils from the proposed action seawall design changes.

The levee and floodwall will both have increased footprints under the proposed action (see Appendix B). There is a minor quantitative increase in impacts to soils due to the increased footprint. However, like the seawall, the larger footprints of both features would impact the same soil types as in the FEIS. The qualitative impacts remain the same and are within the range of impacts assessed in the FEIS. Therefore, the design changes associated with the levee and floodwall are considered to have minimal impacts to soil resources (see Table 7 and Table 8).

Floodwall	**Design Change**	Increase length from 1,800 to 2,100 linear feet	~55% more armor stone along western side of OBWWTP	Approximately 2.5x steel required for pile foundations	Relocated sludge force main	Additional drainage and utility crossings require special monoliths
	Impact	Minimal	N/A	N/A	Minimal	Minimal

Table 7: Impacts to geology, topography, and soils from the proposed action floodwall design changes.

Levee	**Design Change**	Crest elevation raised from +16.9 to +17.7 feet NAVD88	Flattened side slopes from 2.5:1 to 3:1	Addition of DMM foundation support	Added rip rap scour protection below +3.5 NAVD88	Replaced sludge force main
	Impact	Minimal	Minimal	N/A	Minimal	Minimal
	Design Change	Added knee wall south of tide gate	Added access road and access at tide gate	Relocated sludge force main	Relocated drainage line	Staged construction
	Impact	Minimal	Minimal	Minimal	Minimal	N/A

Table 8: Impacts to geology, topography, and soils from the proposed action levee design changes.

The construction of the interior drainage areas under the proposed action results in a minor increase in acres of soil impacts from that described in the FEIS. The increase in

pond footprints would impact additional wetland areas (assessed separately in Section 5.3.3). As the quantitative impacts are minor, and the qualitative impacts remain the same, the design changes associated with the interior drainage areas are considered to have de minimis impacts to soil resources (see Table 9 and Table 10).

Area B	**Design Change**	Acreage changed from 46 to 48 acres	Added relief diversion structure on Tysens Lane Outfall	Added second tide gate
	Impact	De minimis	De minimis	De minimis

Table 9: Impacts to geology, topography, and soils from the proposed action Area B design changes.

Area E	**Design Change**	Change from two ponds (34 acres) to 3 ponds (38.6 acres)	Pond bottom lowered to -2 NAVD88	580-ft-long channel added between ponds	Additional junction chambers, weir chambers, inlets added
	Impact	De minimis	De minimis	De minimis	De minimis

Table 10: Impacts to geology, topography, and soils from the proposed action Area E design changes.

As described in Section 4.1.8, the tidal wetlands/mosaic of habitats feature has decreased in size due to the realignment of the seawall and the removal of dune grass plantings from the feature design. This decrease results in fewer acres of soil impacts. As the proposed action's tidal wetland/mosaic of habitats is within the footprint of the NED plan, the impacts associated with this feature are within the range documented in the FEIS and are considered to have no additional impact to this resource. Potential impacts to wetland habitat and function are considered in Section 5.3.3.

5.1.4 Compliance with NEPA (Comparison to FEIS)

Based on the above assessment, the impacts to geology, topography, and soils of the proposed action are quantitatively larger than those assessed in the FEIS. However, qualitatively these impacts are the same, as the same soil types are impacted under either plan. The BMPs and measures identified in the FEIS will be followed in the construction of the proposed action.

5.2 Water Resources

5.2.1 Existing Conditions

Section 3.2 of the FEIS describes the existing water resources condition. This includes regional hydrogeology and groundwater (Section 3.2.1), surface water (Section 3.2.2), water quality (Section 3.2.3), tidal influences and floodplains (Section 3.2.4), and wastewater (Section 3.2.5). Appendix B of the FEIS includes a Section 404(b)1 evaluation of the NED Plan (USACE 2016a).

5.2.1.1 Changes to the Existing Conditions Since the FEIS

The FEIS descriptions of regional hydrogeology and groundwater, and surface water resources remain representative of the resources present in the study area.

The NYSDEC Environmental Mapper was referenced (NYSDEC 2022a) and the classification of the Lower Bay and the streams within the proposed project area have not changed from the FEIS.

Groundwater sampling and monitoring within the interior drainage areas were conducted during PED (USACE 2018). In general, the water table is at or near the ground surface in all three drainage areas. The monitoring wells nearest Raritan Bay in Area B indicated tidal influence on groundwater in the southern end of the drainage basin. Further investigation in Area B found that tidal influence ended prior to Kissam Avenue (i.e., not within the proposed pond area). This is consistent with the FEIS.

Additional groundwater investigations in Area E were conducted to inform dewatering permits prior to construction of that contract (USACE 2022a). These investigations found concentrations of several metals exceeded the NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (NYSDEC 1998). Additional metals, total suspended solids, and oil and grease were also identified but are not regulated under these standards. These results reflect conditions expected for an urban environment and are likely representative of the remaining drainage areas. Additional groundwater investigations in Area B and Area C, as well as any other areas requiring dewatering, will be conducted prior to construction.

5.2.2 FEIS Impacts

Section 4.2 of the FEIS describes the impacts of the NED plan to water resources. The FEIS concluded that:

> "Construction activities would not change the total volume of groundwater available, or the quality or usability of groundwater supplies. Construction activities may cause a temporary, short-term increase in suspended sediment and turbidity in surface waters adjacent to the Project. However, the suspended sediments and turbidity are expected to settle quickly out of the water column, and therefore no long-term adverse impacts to surface water quality are expected. Discharge of dewatering effluents, if any, would be subject to the requirements of the SPDES discharge permit." (USACE 2016a).

5.2.3 Proposed Action Impacts

Construction of the proposed action may cause a short-term temporary increase in suspended sediments and turbidity in surface waters adjacent to the project, as documented in the FEIS. Construction methods and materials of the proposed action are largely the same as were assessed in the FEIS.

The design changes within Area E are due to the incorporation of the Bluebelt designs. The FEIS assessed these designs as alternatives and these design changes will not be assessed further for this resource.

Due to the inclusion of a second tide gate within Area B (see 'Tide Gate B1' in Figure 9) water within drainage area B1 (see Figure 9) will continue to drain directly into the tidal

creek. The tide gate would not allow for inflow of tidal water and Area B would remain freshwater.

Several design changes result in minor shifts to the footprint of each feature. These design changes may result in short-term temporary increases to suspended sediments and turbidity in surface waters adjacent to the project. These design changes were determined to be de minimis, as this temporary increase in turbidity was assessed in the FEIS. See Table *11*, Table 12, Table 13, and Table 14 for these design changes by contract.

Seawall	**Design Change**	Flattened side slopes from 2:1 to 3:1 on land side and to 5:1 on water side.	Slight realignment of seawall from FEIS	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Promenade width increase to 27 feet
	Impact	De minimis	De minimis	De minimis	De minimis

Table 11: Impacts of seawall design changes to water resources.

Floodwall	**Design Change**	Increase length from 1,800 to 2,100 linear feet	Additional drainage and utility crossings require special monoliths
	Impact	De minimis	De minimis

Table 12: Impacts of floodwall design changes to water resources.

Levee	**Design Change**	Crest elevation raised from +16.9 to +17.7 feet NAVD88	Flattened side slopes from 2.5:1 to 3:1	Added rip rap scour protection below +3.5 NAVD88	Added access road and access at tide gate
	Impact	De minimis	De minimis	De minimis	De minimis

Table 13: Impacts of levee design changes to water resources.

Area B	**Design Change**	Acreage changed from 46 to 48 acres	Added relief diversion structure on Tysens Lane Outfall	Added second tide gate
	Impact	De minimis	De minimis	De minimis

Table 14: Impacts of area B design changes to water resources.

Discharge of dewatered effluents would be subject to the requirements of the Umbrella SPDES discharge permit. Appendix A of this MFR includes a revised 404(b)1 evaluation for the proposed action.

5.2.4 Comparison to FEIS

The FEIS concluded that construction of the NED plan would result in increased suspended sediments and turbidity in the surrounding surface waters. This impact would be short-term and temporary, with no long-term impacts to water resources anticipated. Under the proposed condition, several design changes shifted feature footprints outside of the footprint assessed in the FEIS. These changes may increase suspended sediments and turbidity in surrounding surface waters. Nevertheless, under either plan, beneficial long-term impacts to water resources, including reduced sediment and other pollutant loadings and improved water quality, are anticipated. Based on this assessment, the proposed action's impacts to water resources would be within the range of impacts assessed in the FEIS.

5.3 Aquatic Resources and Wetlands

The terms used in the analysis of potential impacts to wetlands are defined below. These terms have been used in prior wetland acreage impact calculations and functional assessments. These terms were not explicitly defined in the FEIS; however, the concepts are the same.

- **Permanent impacts** to wetlands include all areas where fill or hard structures would be placed.

- **Temporary disturbances** to wetlands include all areas where excavation or vegetation disturbance would occur during construction. These disturbances are expected to be short-term and will subside as vegetation establishes (typically 1-5 years post-construction.

- **Enhancement** is defined in Appendix C of ER 1105-2-100 as "the net improvement an alternative plan, or project, makes to ecological resources (singularly or collectively) compared to the 'without' plan or condition." (USACE 2019).

  For SSSI, enhancement is the improvements made through the removal of existing *Phragmites* monoculture wetlands during excavation, replanting of native plantings or seeding once construction is complete, and regrading to elevations suited to sustainable wetlands dominated by native vegetation.

- **Offsets** include areas of existing uplands that would be converted to wetland habitats during construction.

- **Net impacts**, or the acres of wetland offsets required for the project to be considered fully self-mitigating, was determined by subtracting the acres of permanently impacted wetlands from the acres of wetland offsets.

5.3.1 Existing Conditions

The existing wetland conditions within the project area are described in Section 3.3.2 of the FEIS. A 2009 wetland delineation identified approximately 297 acres of wetland (both tidal and freshwater) within the project area. Most of these wetlands are well defined emergent wetlands dominated by common reed.

Figure 16 shows the wetland delineation limits and the field delineated wetlands described in the FEIS.

Figure 16: 2009 wetland delineation and delineation limit.

5.3.1.1 Changes in the Existing Conditions Since the FEIS

As the PDT moved from the Feasibility phase to the PED phase, USACE biologists recommended an updated wetland delineation. An updated delineation was conducted in 2017 and identified approximately 317 acres of wetlands (both tidal and freshwater) within the project area. Figure 17 shows the updated wetland delineation. The wetland delineation limits did not change from those used in the FEIS.

Figure 17: 2017 wetland delineation and delineation limit.

In 2019, USACE requested that NYSDEC field verify the tidally influenced wetlands identified in the 2017 delineation. During this effort, NYSDEC identified an additional 0.23 acres of tidal wetland that had not been previously delineated.

Figure 18 shows both the tidally influenced wetlands delineated by NYSDEC in 2019 and the 2017 delineation.

Figure 18: 2019 supplemental delineation, 2017 wetland delineation, and wetland delineation limit.

To summarize, an additional 20.23 acres of wetland habitat were identified in the updated wetland delineations. These additional acres of wetland were not identified in the 2009 wetland delineation and were therefore not included in the FEIS.

5.3.2 FEIS Impacts

Section 4.3.2. of the FEIS discusses the NED plan impacts to wetlands. The FEIS concluded that:

> "With respect to wetlands, the NED Plan will impact 144.64 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 10.89 acres is related to the fill associated with the LOP Project feature resulting in a permanent loss of the existing wetlands. There are 117.25 acres of impact associated with the interior drainage project feature (within Drainage Areas B, C, and E) being created for surface water detention as well as 16.5 acres of impact associated with the construction of the tidal wetland (mosaic of habitat) feature. In addition, excavation for the interior drainage features will impact an additional 11.3 acres of existing upland habitat. This excavation, re-grading and seeding/planting of native vegetation (and removal of the existing *Phragmites* monoculture) will provide emergent wetland habitat in these areas where wetland did not previously exist. Taken as a whole, the NED Plan would produce a net significant positive impact on wetland habitats and the quality of wetlands in the Project area." (USACE 2016).

The FEIS impacts are summarized in Table 15. Temporary impacts to wetlands in the FEIS included 117.25 acres within the interior drainage areas and 16.5 acres within the tidal wetland/mosaic of habitats, for a total 133.75 acres of temporary impacts. These temporarily impacted wetlands would be enhanced during construction through planting/seeding of native species and regrading for improved wetland topography and

hydrology. Permanent impacts to wetlands considered in the FEIS included 10.89 acres of fill and hard structures associated with the line of protection. Construction of the interior drainage ponds included the conversion of 11.3 acres of existing upland to wetland habitats. Permanent impacts were subtracted from this offset and resulted in a net gain of 0.41 acres of wetland. Given the net significant positive impact to wetlands, no compensatory mitigation was required.

	Feasibility Wetland Impact Summary (Acres)			
	Temporary	Permanent	Offset[1]	Net[2]
Line of Protection (LOP)	0.00	10.89	0.00	
Interior Drainage Ponds	117.25	0.00	11.3	
Tidal Wetlands (Mosaic of Habitats)	16.5	0.00	0.00	
TOTALS	133.75	10.89	11.3	+0.41

Table 15: NED Plan impacts to wetlands, as documented in the FEIS.

As part of the coordination conducted during feasibility, USFWS reviewed the NED plan and stated:

> "Provided the wetland enhancements function as designed/intended, the proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values. As such, the Service concludes, provided the Service recommended measures are implemented, that the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area." (USFWS, 2015; see FEIS Section 4.3.2 and FEIS Appendix G).

5.3.3 Proposed Action Impacts

Several design changes were identified as having impacts to wetland resources. These design changes are presented in the tables below by contract. Only those design changes that affect the permanent impacts to wetland acres and functional values or that affect the offsets are shown.

The proposed action seawall feature results in approximately 6.8 acres of additional permanent impacts compared to the FEIS (see Table *16*). This is largely due to the flatter side slopes which increased the width of the overall footprint, the realignment of the seawall due to more accurate mapping of utilities, inclusion of the Oakwood Beach service road, and some increase in delineated wetland areas near Oakwood Beach. In addition, the increase in promenade width and the increase in rock crest elevation (and subsequent increase in base width) contributed to the increase in permanent impacts of the seawall feature. The increased width of the seawall footprint is compared to the FEIS footprint in Appendix B. As discussed below in detail (see Table 23 and associated text), these design changes resulting in a decrease in functional value of the

existing wetlands will not require additional compensatory mitigation and therefore are consistent with the conclusions of the FEIS.

Seawall	**Design Change**	Flattened side slopes from 2:1 to 3:1 on land side and to 5:1 on water side.	Slight realignment of seawall from FEIS	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Promenade width increase to 27 feet
	Wetland Acre Impact	Increased permanent impacts	Increased permanent impacts	Increased permanent Impacts	Increased permanent impacts
	Functional Value Impact	Decrease	Decrease	Decrease	Decrease

Table 16: Seawall design changes that contribute to permanent impacts to wetlands.

The proposed action levee feature results in approximately 1.9 acres of additional permanent impacts compared to the FEIS (see Table 17). This is largely due to the increased height and flattened side slopes, which resulted in an increased base width (see Appendix B for footprint comparison). The addition of the maintenance access road at the tide gate also contributed to the increase in permanent impacts. The levee design changes result in a decrease in functional value of the existing wetlands associated with the loss of wetland acres for these features. However, these decreases are offset by the functional value gained in the interior drainage areas and by the tidal wetland/mosaic of habitats, and therefore does not require additional compensatory mitigation and is consistent with the conclusions of the FEIS (see Table 23 and associated text).

Levee	**Design Change**	Crest elevation raised from +16.9 to +17.7 feet NAVD88	Flattened side slopes from 2.5:1 to 3:1	Added rip rap scour protection below +3.5 NAVD88	Added access road and access at tide gate
	Wetland Acre Impact	Increased permanent	Increased permanent	Increased Permanent	Increased Permanent
	Functional Value Impact	Decrease	Decrease	Decrease	Decrease

Table 17: Levee design changes that contribute to permanent impacts to wetlands.

The proposed action floodwall results in approximately 1.5 acres of additional permanent impacts compared to the FEIS (see Table 18). This is largely due to the realignment of the floodwall (see Appendix B for footprint comparison). The floodwall design changes result in a decrease in functional value of the existing wetlands associated with the loss of wetland acres for these features. However, these decreases are offset by the functional value gained in the interior drainage areas and by the tidal

wetland/mosaic of habitats, and therefore does not require additional compensatory mitigation and is consistent with the conclusions of the FEIS (see Table 23 and associated text).

Floodwall	**Design Change**	Increase length from 1,800 to 2,100 linear feet	~55% more armor stone along western side of OBWWTP	Additional drainage and utility crossings require special monoliths
	Wetland Acre Impact	Increased Permanent	Increased Permanent	Increased Permanent
	Functional Value Impact	Decrease	Decrease	Decrease

Table 18: Floodwall design changes that contribute to permanent impacts to wetlands.

Under the proposed action, Area B design changes result in a minimal increase in permanent impacts due to placement of hard structures within wetland areas (i.e., tide gate and diversion structure). These hard structures result in a decrease in functional value of existing wetlands. The increase in acreage of pond B results in an increase to offset areas (existing uplands converted to wetland) and an increase in functional value. The addition of the tide gate contributes to an increase in functional value by increasing hydrologic connectivity within the wetland. See Table 19.

Area B	**Design Change**	Acreage changed from 46 to 48 acres	Added relief diversion structure on Tysens Lane Outfall	Added second tide gate
	Wetland Acre Impact	Additional offset	Increased Permanent	Increased Permanent
	Functional Value Impact	Increase	Decrease	Increase/Decrease

Table 19: Area B design changes that contribute to permanent impacts to wetlands.

Area E design changes result in a minimal increase in permanent impacts to wetlands due to placement of hard structures within the pond. The placement of these structures also results in a decrease in functional value of existing wetlands. The increased acreage of pond E results in additional offset areas (conversion of existing uplands to wetlands) and an increase in functional value of designed wetlands. The remaining design changes shown in Table 20 result in an increase in functional value by increasing connectivity and providing a variety of habitats.

Area E	**Design Change**	Additional junction chambers, weir chambers, inlets added	Change from two ponds (34 acres) to 3 ponds (38.6 acres)	Pond bottom lowered to -2 NAVD88	580-ft-long channel added between ponds
	Wetland Acre Impact	Increased Permanent	Additional offset	N/A	N/A
	Functional Value Impact	Decrease	Increase	Increase	Increase

Table 20: Area E design changes that contribute to permanent impacts to wetlands.

The decrease in acreage of the tidal wetland/mosaic of habitats feature results in a decrease in potential offsets that would have resulted under the FEIS designs and a decrease in potential functional value (see Table 21). This feature overall, however, results in an increase in functional value. This is due to the increased diversity of planned plantings compared to the existing monoculture and to the improved hydrology because of the regraded stream (see Table 23 and associated text).

Tidal Wetlands/ Mosaic of Habitats	**Design Change**	Acreage decreases from 46 to 21.7 acres
	Wetland Acre Impact	Decreased Potential Offsets
	Functional Value Impact	Decrease in Potential Value

Table 21: Tidal wetland/mosaic of habitats design changes that contribute to permanent impacts to wetlands.

Due to refinements to design that have occurred since the FEIS and the availability of updated wetland delineation data, USACE biologists determined that an updated wetland acre impact calculation for the project was necessary. These wetland delineations resulted in identification of an additional 20.23 acres of wetland within the project area that had not been previously identified. A map series is available in Appendix B that shows both the current layout for the proposed action and the FEIS design layout with the areas of overlap highlighted. In addition, this map series presents the updated wetland delineation and the previous delineation used in the FEIS as well as the tidal wetland offsets where existing upland areas will be converted to wetland.

In April 2021, an updated wetland acreage impact calculation was conducted. The latest design information available at that time for each construction contract was used in the calculation. In February 2023, the acres of permanent impacts to wetland were recalculated to capture refinements made to the line of protection contracts. The 2021 acreage calculations remain representative of the proposed action's temporary disturbances to federally delineated wetlands and offsets gained through construction of the proposed action. The results of this calculation were compared to the impacts documented in the FEIS. This comparison is presented in Table 22 below. See Figure

19 and Figure 20 for maps of the temporarily disturbed, permanently impacted, and offset areas associated with the proposed action.

	Feasibility Wetland Impact Summary (Acres)				**Current Designs Wetland Impact Summary (Acres)**			
	Temporary	Permanent	Offset[1]	Net[2]	Temporary	Permanent	Offset[1]	Net[2]
Line of Protection (LOP)	0.00	10.89	0.00		8.27	21.09	0.00	
Interior Drainage Ponds	117.25	0.00	11.3		157.47	2.62	15.06	
Tidal Wetlands (Mosaic of Habitats)	16.5	0.00	0.00		17.64	0.00	2.1	
TOTALS	133.75	10.89	11.3	+0.41	183.38	23.71	17.16	-6.55

Table 22: Comparison of permanent impacts and temporary disturbances to wetlands under the FEIS and the Proposed Action.

[1]Offest is the acres of upland converted to wetland in designs.
[2]Net is the difference between the offset and permanent impacts.

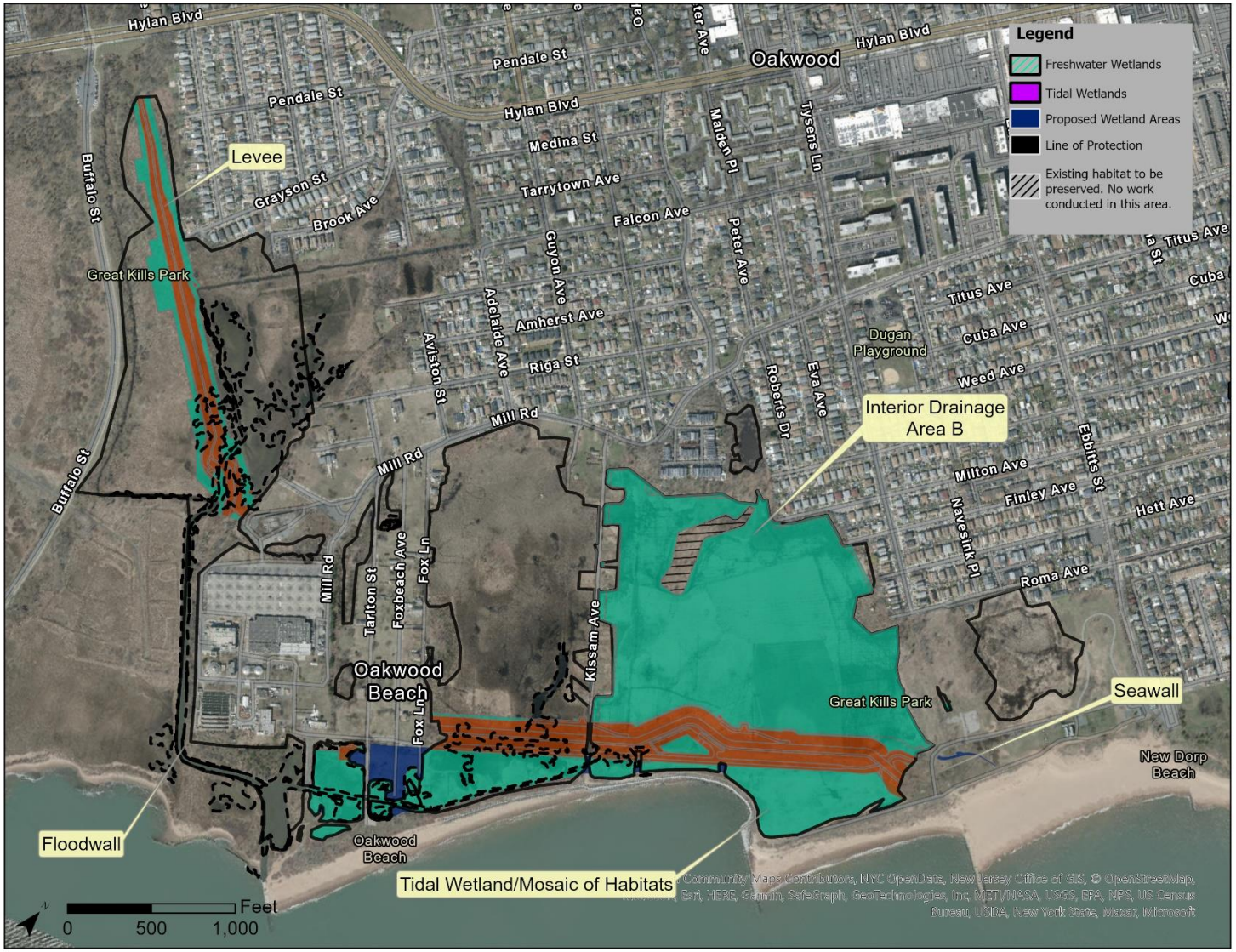

Figure 19: Temporary disturbances, permanent impacts, and offsets within Area B, the line of protection, and the tidal wetlands/mosaic of habitats contract areas.

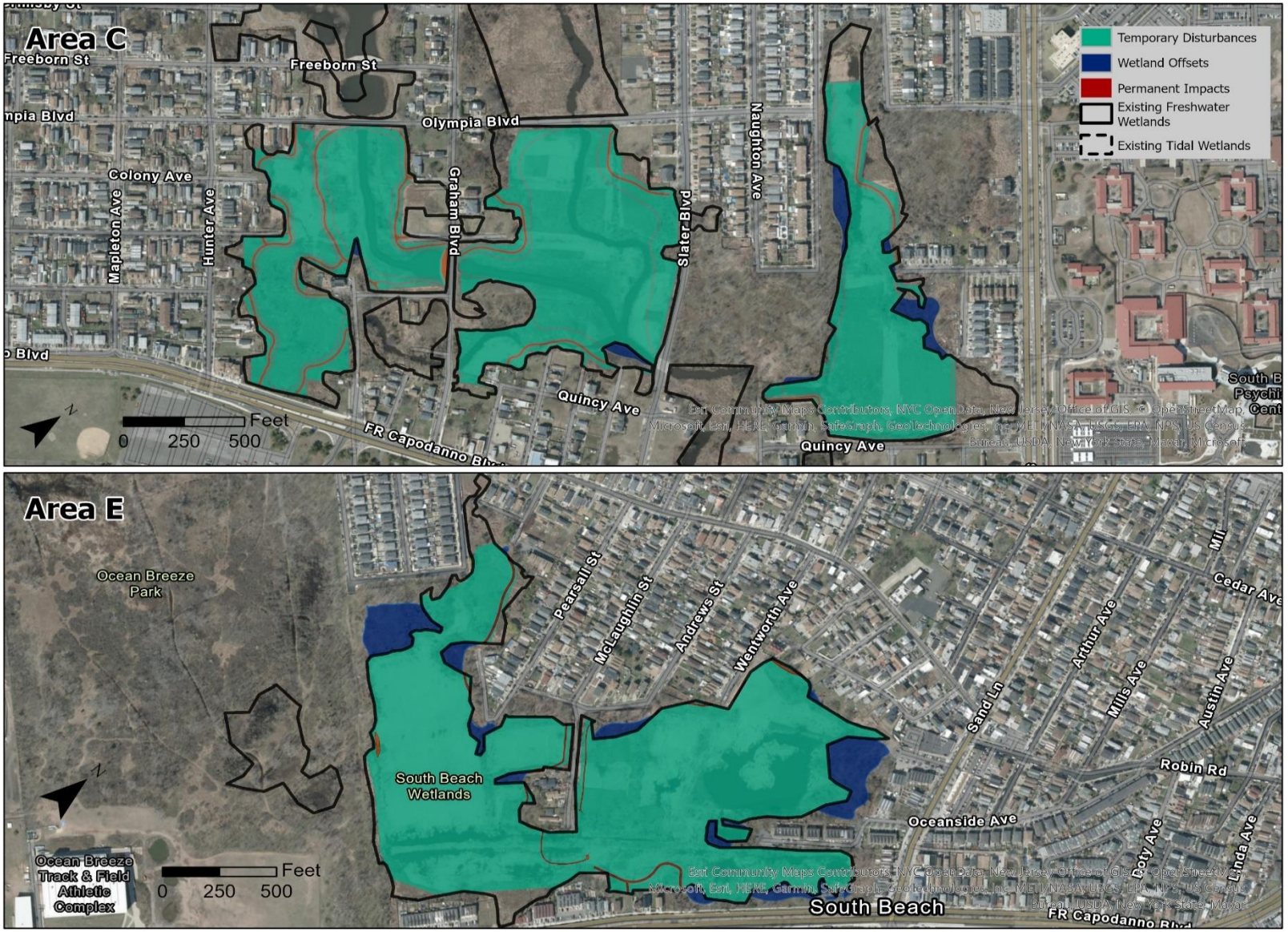

Figure 20: Temporary disturbances, permanent impacts, and offsets within the Area C and Area E contract areas.

The temporary disturbances to wetlands increased from 133.75 acres in the FEIS to 183.38 acres under the proposed action. This increase is due to availability of more detailed designs that include staging areas and construction entrances that were not considered in feasibility, and to the increased acres of existing wetlands delineated in 2017 (see also Appendix B). The FEIS did not consider construction entrances. The FEIS did briefly consider staging areas, see Section 4.2.3 of this MFR for a description of staging areas.

The permanent impacts to wetlands increased from 10.89 acres in feasibility to 23.71 acres under the current designs. This increase is due to refinements made to the line of protection designs and to placement of hard structures in the interior drainage areas.

The offset areas (existing upland areas that will be converted to wetland habitat under the proposed action) increased from 11.3 acres in feasibility to 17.16 acres under the current designs. This is due to the increase in uplands converted to wetlands in the interior, swale areas within the line of protection, and the uplands converted to wetlands in the tidal wetlands/mosaic of habitat feature which were not considered during feasibility.

The results of the wetland acre impact analysis show a quantitative net loss of approximately 6.5 acres of wetlands due to proposed construction. However, the permanent impacts to wetlands along the line of protection and due to placement of hard structures in the interior drainage areas are more than offset by the increase in wetland function within the approximately 180 acres of the interior, qualitatively resulting in no net loss of wetlands. No net loss means that wetland functions must be restored through the mitigation process of creating new wetlands or preserving existing wetlands and enhancing their functionality.

In addition to restoring the approximately 180 acres of temporarily disturbed wetlands by replanting with native species, those areas will be functionally enhanced by regrading to elevations suited to sustainable wetlands dominated by native vegetation and tying in to existing upland contours to improve wetland topography/hydrology. The interior upland areas will be regraded to support wetland vegetation and to better manage flood risk by providing efficient water transfer within the system. Contouring would emphasize restoration of existing drainage and landform patterns, to the greatest extent practicable. The constructed wetlands will support a diverse wetland community with greater interspersion of vegetation cover types and water/vegetation than what is currently present in the *Phragmites* monocultures. During grading activities, the ponds will be over-excavated by 1 foot to remove *Phragmites* rhizomes present in the soil, and a foot of clean planting material will be placed. Hydrologic conditions will be improved because of the construction of permanent micro pools (with depths of approximately 3 feet) and extended detention basins (with approximately 18 inches of standing water expected on average). These improvements would increase wildlife value by providing a larger variety of habitats than the existing conditions and would increase channel

connectivity for fish and other aquatic species (specifically in Area C, where there is viable fish habitat).

To quantify the enhancement in wetland function associated with structural improvements to interior drainage and tidal wetland/mosaic of habitats feature, USACE biologists conducted an Evaluation of Planned Wetlands (EPW) assessment. EPW is a rapid-assessment procedure used to determine whether planned wetlands have been adequately designed to achieve their functional goals. An EPW assessment results in functional capacity indexes (a wetland's capacity to perform a function) and functional capacity units (FCU) (the quantity of functional capacity in the wetland). The EPW assessment conducted for SSSI compared the net functional capacity units of existing wetlands (only in those areas that would be disturbed/impacted by the proposed action) to the proposed action's wetlands. The net results of the EPW assessment are shown in the Table 23 below. The associated EPW report can be found in Appendix C of this MFR.

	Freshwater FCUs	**Tidal FCUs**
Temporary Disturbances	-249.79[1]	-41.77[1]
Areas of enhancement post-construction	+338.00	+63.75
Net enhancement of temporarily disturbed areas	*88.22*[2]	*21.98*[2]
Permanent Impacts	-20.53[1,2]	-20.40[1,2]
Offset gained (uplands to wetlands)	+19.82[2]	+5.10[2]
Net FCUs	**87.51**	**6.68**

Table 23: EPW assessment net Functional Capacity Units (FCUs) for Freshwater and Tidal Wetlands.

[1]Numbers in red indicate negative numbers.
[2]Underlined numbers were summarized to obtain NET FCUs for freshwater and tidal wetlands; NET FCU = (net enhancement + offset gained) – permanent impacts

The functional units gained through these enhancement activities (88.22 FCUs of freshwater habitat and 21.98 FCUs of tidal wetland habitat) would result in a net gain of wetland functional value (restoring the bottom elevation in a wetland can be critical for reestablishing hydrological regime, natural disturbance cycles, and nutrient fluxes). The construction of the line of protection and the placement of hard structures in the interior does result in a loss of 20.53 FCUs of freshwater habitat and 20.40 FCUs of tidal wetland habitat. The functional units gained through enhancement and through the conversion of existing uplands to wetlands resulted in a net gain of 87.51 FCUs of freshwater habitat and 6.68 FCUs of tidal wetland habitat.

The results of the EPW assessment support the conclusion that the enhancement of temporarily disturbed wetlands and the conversion of existing upland areas to wetlands more than offsets the permanent impacts to wetlands due to construction of the proposed action. The project therefore maintains its self-mitigating status, as described in the FEIS. No compensatory mitigation is necessary.

It is important to note that the interior drainage ponds are currently freshwater wetlands and will continue to be freshwater wetlands post-construction. *Phragmites* will continue to be an issue and will not be eradicated in construction of the project; this has been acknowledged and accepted by USACE and the local partners. Monitoring and adaptive management will include monitoring and removal of invasives (hand-pulling, herbicide application, etc.). The trigger for adaptive management continues to be 85% cover of plantings and less than 10% cover of invasives, as is standard practice. OMRRR will include the maintenance of these areas. Appendix D of this MFR contains an updated MAMP for the proposed action.

5.3.4 Compliance with NEPA (Comparison to FEIS)

In the FEIS, the NED Plan permanently impacted 10.89 acres of wetland. These impacts were offset by 11.3 acres of wetland creation, resulting in a net significant positive impact on wetland habitats and the quality of wetlands in the project area. The FEIS concluded that the project was self-mitigating, and that no compensatory mitigation was required.

Under the proposed action, 23.71 acres of wetland are permanently impacted. These impacts are offset by 17.16 acres of wetland creation, which results in a net loss of wetland acres. However, the functional assessment conducted as a part of this reevaluation determined that the proposed action results in a net gain of functional units of both freshwater and tidal wetland habitats. This increase in wetland quality allowed for the proposed action to be considered self-mitigating and in line with the conclusions drawn in the FEIS. No compensatory mitigation is necessary for the proposed action. Additionally, it is expected that the acres of impact to wetlands will decrease as designs are further refined.

Based on this assessment, the proposed action is within the range of impacts assessed in the FEIS.

5.4 Wildlife

5.4.1 Existing Conditions

Section 3.4 of the FEIS discusses the existing wildlife resources within the SSSI project area. These include benthic resources (Section 3.4.1), essential fish habitat (Section 3.4.2), reptiles and amphibians (Section 3.4.3), birds (Section 3.4.4), and mammals (3.4.5). Threatened and Endangered Species are considered separately and are addressed in Section 5.5 of this MFR.

5.4.1.1 Changes in the Existing Condition from the FEIS

There are no changes from the existing condition described in the FEIS.

5.4.2 FEIS Impacts

The FEIS concluded that:

> "Construction activities would disturb habitats and cause birds and other wildlife to avoid areas undergoing construction. Disruptions to wildlife would be temporary and short in duration across the Project construction areas. The USACE would have a process in-place for the rescue of wildlife, including fish, as may be necessary to avoid impacts or as may be required during the Project construction process. The NED Plan would also implement BMPs during construction activities to avoid impacts to wildlife. Therefore, the NED Plan would not result in potential significant adverse impacts to wildlife during construction." (USACE 2016a).

5.4.3 Proposed Action Impacts

The proposed action feature footprints were compared in GIS to the feasibility level designs (see Appendix B) and were determined not to be significantly different when considering this resource. The slight shifts in the alignment and feature footprints under the proposed action only overlap with habitats that were identified or assessed in the FEIS. No additional habitats would be impacted.

The design changes related to side slopes of the line of protection result in a wider overall footprint. The widened footprints would impact larger areas of beach and wetland habitats. These impacts were considered as part of the functional assessment conducted for this MFR (see Section 5.3.3). It is anticipated that impacts to wildlife would be temporary and short term, subsiding after construction. As the widened footprint would impact a larger area of habitat and impacts to wildlife are expected to be temporary, these impacts are considered minimal.

Additionally, the flattened side slopes of the line of protection may provide minimal beneficial impacts compared to the FEIS designs (see Table 24). The flattened slopes would allow for easier crossing of the structure by wildlife in the area (i.e., deer) compared to the steeper slopes proposed in the FEIS.

Contract	**Levee**		**Seawall**
Design Change	Staged construction to allow for settling	Flattened side slopes from 2.5:1 to 3:1	Flattened side slopes from 2:1 to 3:1 on land side and to 5:1 on water side.
Impact	De minimis	Minimal/*Reduction of FEIS impacts	Minimal/ *Reduction of FEIS impacts

**can also be considered beneficial impacts*

Table 24: Design change impacts to wildlife under the proposed action.

The staged construction of the levee may increase the duration of temporary impacts to wildlife in the area, as this design change would increase the overall construction duration. However, the impacts of this design change would remain temporary and short-term and is therefore determined to have a de minimis impact.

5.4.4 Compliance with NEPA (Comparison to the FEIS)

The FEIS determined that impacts to wildlife because of construction of the NED Plan would be short-term and temporary and would not result in significant adverse impacts to wildlife. Under the proposed action, the construction of the levee feature may increase the duration of temporary impacts to wildlife but would not result in a significant adverse impact. The proposed action's flattened side slopes would also reduce the FEIS impacts by allowing for easier crossing of the line of protection by local wildlife. Impacts to wildlife under either plan are expected to be short-term and temporary. Therefore, the proposed action impacts to wildlife are within the range described in the FEIS.

5.5 Threatened and Endangered Species

5.5.1 Existing Conditions

Section 3.5 of the FEIS describes the endangered species, species of concern, and natural areas and communities of concern within the project area. The FEIS identified the federally threatened piping plover (*Charadrius melodus*) and rufa red knot (*Calidris canutus rufa*) as having potential to occur within the project area.

5.5.1.1 Changes in the Existing Condition from the FEIS

A review of the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) tool for federally listed species cited the threatened piping plover, endangered roseate tern (*Sterna dougallii dougallii*), and the candidate species for listing, monarch butterfly (*Danaus plexippus*), as being potentially present in the project area (USFWS 2022).

The IPaC website did not identify rufa red knot. The species has potential to occur in the area and USACE continues to monitor for rufa red knot in the project area per previous USFWS coordination.

5.5.2 FEIS Impacts

The FEIS concluded that:

> "USACE determined that because the proposed construction of the LOP and drainage areas are outside of the potential habitat suitable for red knot foraging, those Project features will not affect the Rufa Red Knot. In their ESA Section 7 Coordination, the USFWS identified the Rufa Red Knot as feeding in the Great Kills vicinity, which is south of Oakwood Beach, which is the southern end of the project. The USFWS indicated a possibility that it might also feed in the Oakwood Beach area. To protect the Rufa Red Knot from disturbance, the USFWS recommended a seasonal window that would preclude construction in the Oakwood Beach area between May 1 and June 15 and also between July 15 and November 30, with the understanding that it can be modified if two years of surveys show no red knots are utilizing the Oakwood Beach area." (USACE 2016a).

A “may affect, but is not likely to adversely affect” determination was made for the rufa red knot, as the species may be present in the Oakwood Beach area. This area includes the Great Kills Park mudflats, Oakwood Beach, and Cedar Grove Beach.

A no effect determination was made for piping plover.

5.5.3 Proposed Action Impacts

Per USFWS recommendation, IPaC is referenced every 90 days to determine if changes in potentially present endangered species have occurred within the project area. A memo on the updated IPaC list was provided to USFWS on January 11, 2022. Table 25 shows the determinations made for each species with potential to be present in the project area.

Species Common Name	Federal Status	Determination (Source)
piping plover	Threatened	No effect (Personal Communication 2016)
rufa red knot	Threatened	May affect, but is not likely to adversely affect (2016 FEIS)
roseate tern	Endangered	No effect (Jan 2022 Memo)
monarch butterfly	Candidate	N/A as candidate species (Jan 2022 Memo)

Table 25: Summary of ESA determinations.

USACE biologists have monitored for the rufa red knot in the Oakwood Beach area (see Figure 21 for a map of survey area) once weekly each year from May 1 – June 15 and July 15 – November 30. The monitoring data (2017-2022) includes one observation of red knot in 2018. All monitoring data to date has been provided to the National Parks Service (NPS), USFWS, and NYSDEC. USACE has determined, based on this data, that red knot have not and are not expected to commonly utilize the area or its resources. Monitoring will be conducted twice weekly in the Oakwood Beach area per the project’s state Water Quality Certificate (WQC) in the year prior to construction in that area. Per the most recent schedule, this monitoring may occur in the 2023 season. In addition, an environmental monitor will be on site during construction and USFWS will be contacted should a species of concern be observed.

No roseate tern have been observed during USACE shorebird monitoring and all colonies are located outside of the project area. The species is highly mobile and capable of avoiding construction activities, disturbances would be short-term and localized. USACE determined there would be no effect to roseate tern. There has been one observation of piping plover during USACE shorebird monitoring in 2018. USACE determined that piping plover do not utilize this area. The project has not moved within potential habitat suitable for piping plover nesting or foraging and, therefore, there is no change to the No Effect determination documented in the FEIS based on the design changes.

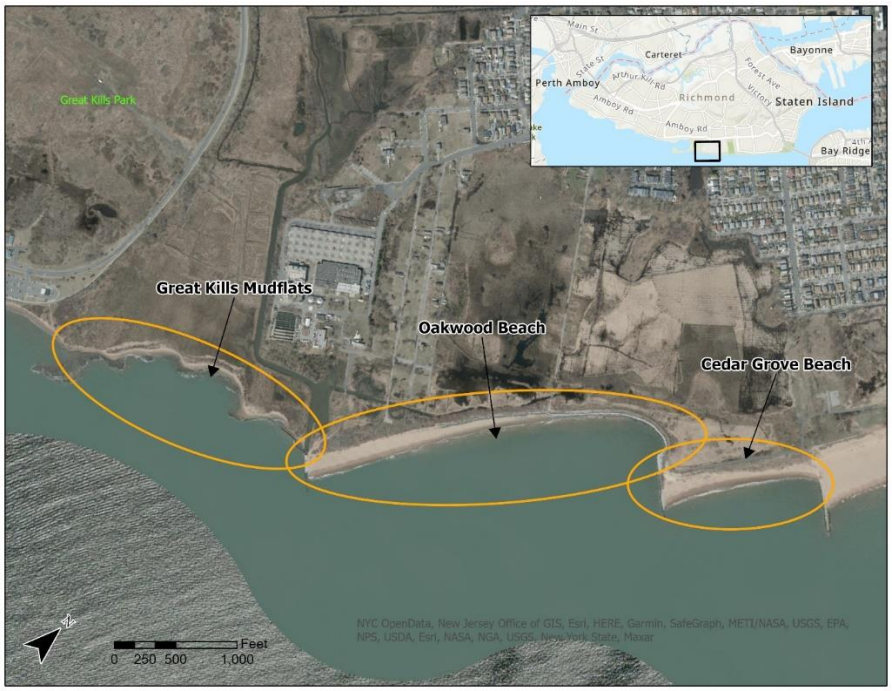

Figure 21: Rufa red knot monitoring area: Great Kills mudflats, Oakwood Beach, and Cedar Grove Beach.

Features of the proposed action near this monitoring area include the floodwall, the portion of the seawall from Oakwood Beach to Miller Field, and the tidal wetlands/mosaic of habitats. Proposed action feature footprints were compared to the FEIS in GIS (see Appendix B). Although there are minor changes to the footprints of these features under the proposed action, these features remain outside of the potential suitable habitat for red knot foraging. Based on this, no design changes were individually assessed for impacts to threatened and endangered species.

Based on prior monitoring data, implementation of best practices, and the presence of an environmental monitor on site during construction, it is not likely that the proposed action will have significant impact on endangered species. This conclusion is consistent with the analysis conducted in the FEIS.

5.5.4 Compliance with NEPA (Comparison to the FEIS)

A “may affect, but not likely to adversely affect” determination was made for red knot. The FEIS concluded that there would be no effect to red knot, as the NED plan was outside of the area of suitable foraging habitat. The proposed action footprint remains outside of the suitable foraging habitat and would not impact red knot. Pre-construction monitoring data collected to date support the conclusion that red knot have not and are not expected to commonly utilize the area and its resources. The proposed action is within the range of impacts documented in the FEIS.

Per the project’s section 7 consultation: “Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered.” USACE will continue to follow the plan developed

in feasibility and will keep USFWS updated on changes to listed species presence/absence for the project, design changes to the project, and will provide input opportunities as designs are further refined.

5.6 Socioeconomics and Environmental Justice

Under Executive Order 12898, Federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. Environmental justice is defined by the U.S. EPA as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws and policies."

5.6.1 Existing Conditions

Section 3.6.4 of the FEIS describes the potential environmental justice areas within the project area. Potential EJ areas (PEJA) were identified in the FEIS using the NYSDEC mapper, and included Great Kills, Miller Field, and Fort Hamilton as potential EJ areas (USACE 2016a).

5.6.1.1 Changes in the Existing Conditions from the FEIS

In January 2021, three additional executive orders were released by President Joseph R. Biden related to environmental justice: Executive Order 13895, Executive Order 13990, and Executive Order 14008. The Assistant Secretary of the Army for Civil Works released a memorandum providing implementation guidance for these executive orders. In accordance with the March 15, 2022 memo, Interim Implementation Guidance on Environmental Justice and the Justice 40 Initiative (USACE 2022b), the CEQ's Climate and Environmental Justice Screening Tool (CEJST) was referenced (CEQ 2022), in addition to NYSDEC PEJA Mapper and the EPA's EJ Screen tool. It should be noted that EJ Screen tool indicated a few environmental justice indices were in the 95th percentile, compared to the U.S., in the Miller Field area (specifically diesel particulate matter and lead paint).

The CEJST identifies disadvantaged communities that are above the threshold for one or more of the eight categories of criteria: climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, reduction and remediation of legacy pollution, critical clean water and wastewater infrastructure, health burdens, and training and workforce development.

Within the project area, the tool identified three census tracts in the Midland Beach and South Beach areas as disadvantaged due to exceeding thresholds in the workforce development category (specifically levels of education and linguistic isolation), as well as exceeding the threshold of one or more socioeconomic indicators. The below Figure 22 shows the census tracts identified by the CEJST. Shaded census tracts indicate areas identified by the mapper as disadvantaged.

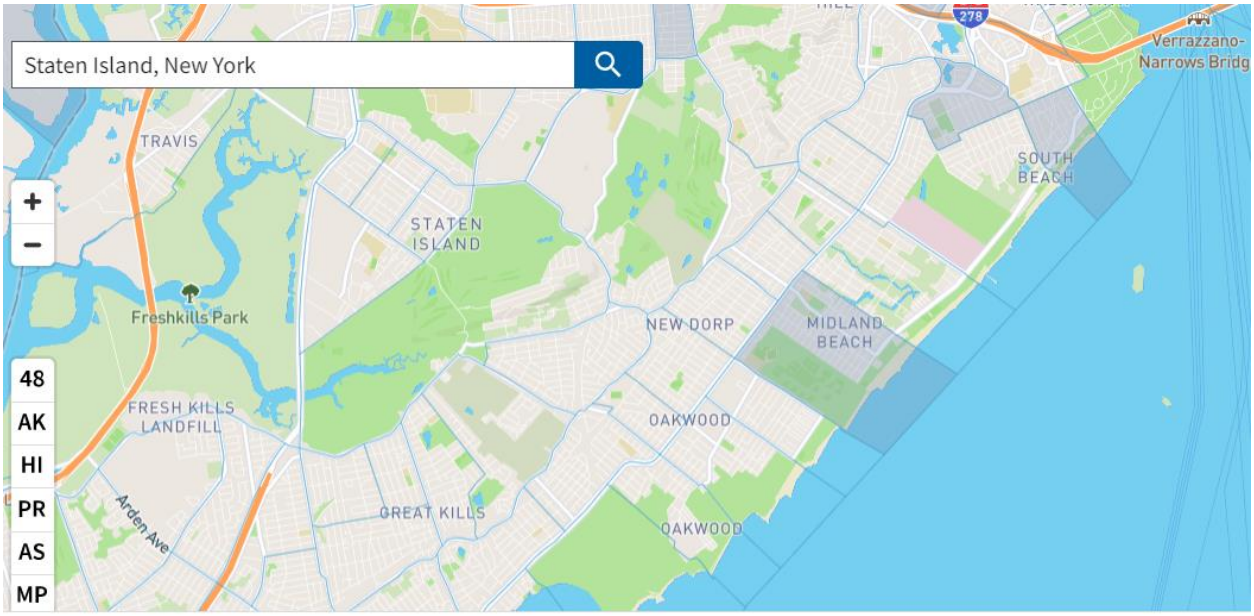

Figure 22: CEQ Climate and Economic Justice Screening Tool displaying the SSSI project area.

5.6.2 FEIS Impacts

Section 4.6.4 of the FEIS assesses the impacts of the NED plan on environmental justice communities. The FEIS concluded that:

> "Construction activities would not produce new development or increase development density within the Project area. Construction requirements are expected to be met by workers within, or near, the Project area, so in-migration of workers is not expected. While construction activities would result in a positive contribution to the overall economy and incomes, the impact is expected to be small.
>
> The analysis in this EIS supports the conclusion that there would be no high and adverse impacts to any groups in the population from construction activities, and thus, no environmental justice impacts." (USACE 2016a).

The FEIS additionally stated that,

> "By reducing the risk of damages from hurricane and storm surge flooding, implementation of the NED Plan would result in positive impacts to all individuals in the Project area." (USACE 2016a).

5.6.3 Proposed Action Impacts

The analysis conducted in the FEIS followed the commonly used practice for EJ assessments at the time. Since the publication of the FEIS in 2016, additional guidance has been published requiring a more in-depth assessment of impacts to environmental justice communities than what was conducted in the FEIS. The NAN Environmental Justice Strategic Plan working draft was referenced, and this assessment was coordinated with the NAN Environmental Justice Coordinator.

From review of the proposed action footprint, the disadvantaged communities identified in the CEJST are potentially impacted by the construction of the boardwalk reach of the seawall, the area C ponds, and the area E ponds (see Figure 23). The following assessment of potential impacts to disadvantaged communities is limited to design changes specific to these two features of the project.

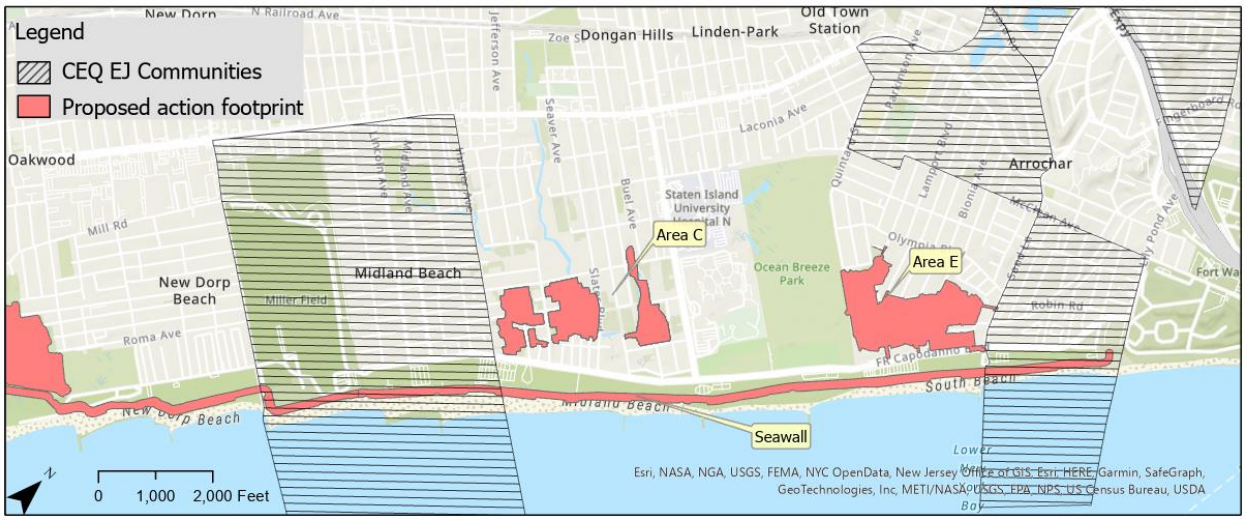

Figure 23: Comparison of the CEJST identified disadvantaged communities and the proposed action footprint.

The proposed action's design for Area C would not result in a change in impact to disadvantaged communities from what was documented in the FEIS. The only design change for Area C is the decision for USACE to build only ponds 1-3. The designs of these ponds have not changed from what was assessed and documented in the FEIS.

Likewise, the proposed action's design for Area E would not result in a change in impact to disadvantaged communities from what was documented in the FEIS. The proposed action Area E footprint is not significantly different from the FEIS-level design. The design changes to this contract were the result of the local partner's request to incorporate NYCDEP Bluebelt designs. The Bluebelt plan was assessed as an alternative in the FEIS. Based on this, it was determined no further assessment of Area E impacts to disadvantaged communities was needed.

Construction of the seawall is not anticipated to result in disproportionate impacts to the disadvantaged communities identified in the CEJST. Construction will move linearly along the line of protection, and no one community is expected to be disproportionately impacted. Beneficial impacts are anticipated, as the communities will have reduced risks from hurricane and storm surge flooding once construction of the project is complete.

The FEIS-level seawall and proposed action seawall footprints were compared in GIS (see Figure 7 and Appendix B) and the footprints were not determined to be significantly different. Thus, design changes to the seawall relating to changes in footprint were not considered in the assessment of impacts to disadvantaged communities. The remaining

design changes were assessed further. Table 26 shows the seawall design changes and their impacts to disadvantaged communities.

Seawall	**Design Change**	Change from a buried rock seawall to a double sheet pile design	Flattened side slopes from 2:1 to 3:1 on land side and to 5:1 on water side.	Slight realignment of seawall from FEIS	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Promenade width increase to 27 feet	Armor stone increased from 3 tons to 5 tons
	Impact	De minimis	N/A	N/A	De minimis	N/A	N/A

Table 26: Proposed action seawall design changes impacts to disadvantaged communities

The change from buried rock seawall to a double sheet pile design was assessed to determine if there would be additional noise impacts to disadvantaged communities. Section 5.15 of this MFR discusses the noise level from construction that would be experienced at several noise sensitive receptors along the project area. Of these receptors, 5 fall within the disadvantaged communities identified in CEJST. None of these receptors would be exposed to construction noise over 100dBA due to the use of an impact pile driver; receptors that would be exposed to noise over 100dBA fall outside of the disadvantaged communities. As such, impacts from noise related to construction is not anticipated to disproportionately affect disadvantaged communities.

The increase in rock crest elevation was assessed to determine if there would be additional viewshed impacts within disadvantaged communities. Section 5.10 of this MFR discusses the proposed action impacts to aesthetic/viewshed. The rock crest elevation increased from +19.4 to +21.4 feet NAVD88 along the entire seawall. A total height of +21.4 feet NAVD88 was assessed in the FEIS. As this height was assessed in the FEIS and is the same height for the entire seawall, it was determined that this design change did not disproportionately impact disadvantaged communities in the project area.

The proposed action would maintain the same or an increased level of access to recreational opportunities described in the FEIS for all communities.

5.6.4 Compliance with NEPA (Comparison to the FEIS)

The FEIS concluded that the NED Plan would not have significant adverse impacts to any community in the project area and would therefore not disproportionately impact EJ communities. Based on the above environmental justice reassessment, the proposed action will not disproportionately impact disadvantaged communities. The proposed action footprint was determined to not be significantly different from the NED plan in the areas near disadvantaged communities. Impacts from construction noise, viewshed, and recreational access were assessed and were determined to not have

disproportionate impacts. The proposed action therefore does not result in disproportionate impacts to disadvantaged communities within the project area and is within the range of impacts assessed in the FEIS.

5.7 Cultural Resources

5.7.1 Existing Conditions

Section 3.7 of the FEIS discusses the existing cultural resources in the project area and these resources are summarized here. Much of the project's Area of Potential Effect (APE) has been subject to cultural resource surveys by the USACE or by others. A reconnaissance report was prepared for this study in 1995 which summarized the cultural resources work to date in the project vicinity, provided a brief overview of historic map research, and recommendation for future work (Rakos 1995). This work summarized and updated a previous study undertaken for the project (Lipson, et al. 1978). The USACE conducted archaeological investigations at Oakwood Beach in 1995 (Rakos 1996). A Phase I survey of the entire SSSI project area was completed for USACE in 2005 (Panamerican Consultants, Inc. [Panamerican] 2005). This work included archaeological testing and an historic architectural survey. The only historic structures identified in the APE are at Miller Field and include a World War II fire tower, Elm Tree Light, and Hangar 38. The resulting report recommended further archaeological investigations in selected locations along the proposed project alignment and within interior drainage features as testing had not been conducted within those locations.

5.7.1.1 Changes in the Existing Conditions Since the FEIS

The District conducted investigations pursuant to Stipulation 1.A of the Programmatic Agreement (PA) in 2019, where geoarchaeological investigations of the LOP were utilized to locate any deeply buried Native American sites. The report entitled, *Geomorphological/Archaeological Study, South Shore of Staten Island Coastal Storm Reduction Project, Borough of Staten Island, Richmond County, New York* (Hunter Research, Inc. 2020) was coordinated with the NYSHPO, NYCLPC, GATE, and NPS Region 1 Headquarters.

Due to the potential of the proposed action to affect historic properties, a 2020 cultural resources investigation, *Investigations on Miller Field – Gateway National Recreation Area, Staten Island, NY – in Connection with the South Shore of Staten Island Coastal Storm Risk Management Project,* was conducted in accordance with Section 106 and 110 of the NRHP and Stipulation I.I(3), and Stipulation I.I(2)(c)(ii) of the PA that highlighted the need for additional cultural resources efforts within the APE. The District was also required to investigate historic properties what will be affected by the Undertaking that are adjacent to NR eligible or listed historic districts to evaluate if these historic properties should be included in the existing NR historic district, based on Stipulation I.I(2)(c)(ii) of the PA. The investigations included a ground-penetrating radar (GPR) survey to identify the spatial limits of a seaplane ramp, shovel testing of a 12.3-acre area not included in

the 2005 survey, a National Register of Historic Places eligibility assessment of the fire control tower, and evaluation of the seaplane ramp and concrete apron as contributing elements to the Miller Army Air Field Historic District.

The investigations found the fire control tower and concrete apron to be eligible for inclusion as contributing elements to the Miller Army Air Field Historic District. The investigations also noted several additional potentially contributing features within the APE that were not considered in the 1980 NRHP district nomination for the Miller Army Air Field Historic District including the base flagpole and the remains of pilings for the dock and boathouse. The GPR survey identified a target assumed to be the seaplane ramp, buried at least 6 feet (183 cm) deep within the sand dune along the beachfront. However, due to its depth below the surface the ramp could not be exposed and therefore its NRHP eligibility could not be ascertained at this time. No potentially significant archaeological resources were encountered during shovel testing.

Based on the 2020 findings and in accordance with the PA, the District has identified adverse effects to the above referenced historic properties within the Oakwood Beach to Miller Field Segment as a result of the proposed demolition of the Fire Control Tower and buried Seaplane Ramp, as well potential vibration impacts from construction activities and auditory effects to the Park's visitor experience. Due to location of the reinforced dune and interior drainage features within the periphery of the Historic District, potential visual impacts are expected at two different viewsheds: the exterior viewshed (views of Miller Field from the beach and from the water), and the interior viewshed (historic properties located on Miller Field with a view of the storm surge wall). Finally, there remains a potential for deeply buried archaeological resources within some areas of the Miller Field to Oakwood Beach Segment APE.

5.7.2 FEIS Impacts

Section 4.7 of the FEIS discusses the NED plan impacts to cultural resources. The FEIS concluded:

> "The NED Plan would have adverse effects on the setting and viewshed of the National Register of Historic Places (NRHP)-listed Miller Field Army Airfield Historic District and will also entail the demolition of the World War II fire tower. Coordination regarding minimization and/or mitigation of potential impacts is ongoing." (USACE 2016a).

The USACE, NPS, New York City Landmarks Preservation Commission (LPC) and New York State Historic Preservation Office (NYSHPO) entered into a PA dated August 25, 2016.

5.7.3 Proposed Action Impacts

As the cultural resources identified in the project area were at Miller Field, only design changes to the seawall feature were assessed for new, potential impacts to cultural resources. The proposed action continues to have adverse effects on the setting and viewshed of the NRHP-listed Miller Field Army Airfield Historic District. The adverse effects are limited to the demolition of the World War II fire tower and potential visual

impacts to the Elm Tree Light, which stands south of Hangar 38. These potential impacts continue to require the previously documented construction monitoring/vibration monitoring identified in both the FEIS and the PA and may require additional treatment plans if they are identified during coordination. Coordination regarding the minimization and/or mitigation of those potential impacts and the increased risk of damage during construction is ongoing with the NPS, LPC, and the NYSHPO.

Seawall	**Design Change**	Change from a buried rock seawall to a double sheet pile design	Flattened side slopes from 2:1 to 3:1 on land side and to 5:1 on water side.	Slight realignment of seawall from FEIS	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Promenade width increase to 27 feet	Armor stone increased from 3 tons to 5 tons
	Impact	Increased Potential Risk	Increased Potential Risk	Increased Potential Risk	Increased Potential Risk	N/A	N/A

Table 27: Impacts of the proposed action design changes to cultural resources.

Figure 24: Comparison of FEIS-level and proposed action seawall footprints and cultural resources at Miller Field.

5.7.4 Compliance with NEPA (Comparison to the FEIS)

The proposed action is within the range of effects assessed in the FEIS and would be covered by stipulations in the existing PA. As mentioned above, only those design changes that would result in a slightly different footprint were assessed (see Table 27). The proposed action footprint was compared to the locations of the cultural resources at Miller Field (see Figure 24). Under the proposed action, the seawall footprint is closer in proximity to both the Elm Tree Light as well as Hanger 38 which would increase the risk of potential adverse effects during construction. However, the form of these impacts,

changes to the setting, viewshed and vibrations, remain the same. The proposed action does have increased risk for adverse effects to the Elm Street Light and Hanger 38 due to the reduction in distance of the construction footprint and the resources themselves, however the potential adverse effects to cultural resources have not changed or increased beyond those assessed in the FEIS. Coordination regarding minimization and/or mitigation of potential impacts is ongoing in accordance with the stipulations of the PA.

5.8 Land Use and Zoning

5.8.1 Existing Conditions

Land use and zoning existing conditions are described in Section 3.8 of the FEIS. Land use consists of primarily residential, commercial, and open space/parks. Land use in the pond areas is largely vacant land due to buyouts from NYC in preparation for construction of the SSSI project. Zoning in the project area includes four residential zoning districts, four commercial districts, and one manufacturing zone (USACE 2016a).

5.8.1.1 Changes in Existing Conditions from the FEIS

The New York City Zoning and Land Use Map (NYC Planning 2021) was referenced, and the Zoning Map Amendments tool was used to determine if changes to zoning have occurred since the FEIS. The tool indicated the addition of NYC East Shore Phase I Buyout Areas in Oakwood Beach, Graham Beach, and Ocean Breeze. This addition eliminated an area of C1-1 district, established an area of C1-3 district, and established a Special Coastal Risk District (CR) (NYC Planning 2017). The C1-1 and C1-3 zoning districts were described in the FEIS. The Special Coastal Risk District was created in 2017 and addresses areas that are currently at exceptional risk from flooding and places limits on development in these areas.

Comparison of the NYC mapper and the land use figures in the FEIS did not show significant changes in land use. The project area is largely vacant land and open space, with some residential and commercial areas interspersed.

5.8.2 FEIS Impacts

Impacts to land use and zoning are discussed in Section 4.8 of the FEIS. The FEIS concluded:

> "Construction associated with the NED Plan would take place on Bluebelt lands, City or state parkland, and some private land. Any potential disruptions around ponds, raised roads, and along the LOP due to construction would be temporary and short in duration and would not result in any short-term or long-term land use changes. Construction would not conflict with local zoning or public policies and would not displace any existing uses. Additionally, the NED Plan does not involve any rezonings, new residential or commercial development, or an increase in development density within the Project area." (USACE 2016a).

5.8.3 Proposed Action Impacts

The proposed action was compared to recent NYC land use data in GIS. This analysis found that the proposed action was within two land use categories: vacant land or open space (including City parkland). This is not a change from the FEIS. Based on this analysis, no design changes were identified as having potential impacts to land use and zoning.

5.8.4 Compliance with NEPA (Comparison to the FEIS)

Based on the above assessment, the proposed action will have the same impacts to land use and zoning as described in the FEIS.

5.9 Recreation

5.9.1 Existing Conditions

Section 3.9 of the FEIS describes existing recreational resources within the project area.

5.9.1.1 Changes in the Existing Condition from the FEIS

There have been no changes to existing recreational resources within the project area since the publication of the FEIS.

5.9.2 FEIS Impacts

The FEIS concluded that:

> "Recreational activities that occur along the beachfront and within Miller Field would sustain short-term, direct impacts during Project construction activities, as well as long-term, direct impacts (for example portions of fields). Several baseball fields would be temporarily impacted by construction, as would one soccer field. To the extent practicable, access to the beaches would be maintained throughout construction. The Project could also require the relocation and reconstruction of some park facilities, potentially including comfort stations, concessions, and recreational components such as playgrounds or athletic fields. In addition, parking areas used by people seeking recreation in the Project area may be temporarily closed to the public, to serve as construction staging areas. Specific impacts to facilities will be identified during the refined design of the Project, and in collaboration with NYCDPR. Due to the linear nature of much of the Project, these impacts would be essentially mobile, moving along the LOP as each activity is completed." (USACE 2016a).

5.9.3 Proposed Action Impacts

The levee and floodwall contract areas are not accessible to the public and are not used for recreation. The tidal wetland/mosaic of habitats and interior drainage areas are not used for active recreation but may be used for passive recreation (bird watching and nature observation) and the areas surrounding these contracts may be used for jogging, walking, and bicycling. Construction of these contracts would temporarily impact these recreational uses however these activities would be able to resume after construction.

Only the design changes related to the seawall were identified as having potential impacts to recreation, as this feature is within the existing boardwalk/promenade footprints. The impacts of each design change to recreational resources are presented in Table 28.

Seawall	**Design Change**	Change from a buried rock seawall to a double sheet pile design	Slight realignment of seawall from FEIS	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Promenade width increase to 27 feet	Armor stone increased from 3 tons to 5 tons
	Impact to Recreation	De minimis	N/A	De minimis	De minimis	De minimis

Table 28: Impacts to recreation by design change

The footprints of the feasibility level seawall and of the proposed action were compared in GIS and were not determined to be significantly different (see Appendix B). Based on this comparison, the design changes to the seawall were determined to have the same impacts on recreation as in the FEIS.

The increased width of the promenade has long-term benefits to recreation, as the increased width will provide increased recreational areas than would be provided by the NED plan. The boardwalk segment will be a functional replacement of the existing boardwalk from Midland Beach to Fort Wadsworth. The promenade will replace the existing at-grade paved and pile-supported promenade from Oakwood Beach to Miller Field.

Access to the boardwalk and promenade will be coordinated with NYC Parks. Section 4.2.4 of this MFR summarizes the access areas identified in the FEIS. The preliminary designs for the proposed action include 29 pedestrian access points (17 on the landside and 12 on the beachside) consisting of ramp/stairs. There are an additional 18 vehicular ramps (10 on the landside and 8 on the beachside) for maintenance vehicles. The number of access points and their locations may change as the seawall designs for the proposed action are further refined.

5.9.4 Compliance with NEPA (Comparison to the FEIS)

Both the FEIS and the proposed action result in short-term temporary impacts to recreation. Both plans have similar access to the boardwalk and promenade. The proposed action provides additional recreational areas than the FEIS due to the increased width of the promenade. Based on the above assessment, the proposed action has the same impacts to recreational resources as in the FEIS.

5.10 Aesthetics and Visual Resources

5.10.1 Existing Conditions

Section 3.10 of the FEIS describes the existing aesthetic and scenic resources of the project area.

5.10.2 FEIS Impacts

The FEIS concluded that:

> "Increased traffic, the presence of construction equipment, and the actual construction activities would create short-term, direct adverse impacts to aesthetics and scenic resources. Due to the linear nature of much of the Project, these impacts would be essentially mobile, moving along the LOP as each activity is completed. At Miller Field, the view at ground level from the hangar to the sea could be obstructed and demolition of the WWII fire tower, Elm Tree Light, and alteration of Hangar 38 could change the visual character of the area." (USACE 2016a).

5.10.3 Proposed Action Impacts

Only the design changes that altered the appearance of the project features were considered in this assessment. The slightly different footprints of the proposed action features were assessed in GIS and were determined not to be significant. As the features would be within or near the FEIS footprint it was determined that the shifts in footprint would not have a significantly different visual impact.

The change from a buried rock seawall to a double sheet pile design would alter the core of the seawall structure and would not be visible. To the extent practicable, the wall would be covered with clean fill and seeded with vegetation. The portion of the seawall by the Oakwood Beach service road would not have sand cover to avoid placing a load on the existing sanitary sewer. Based on this, the impacts to visual resources due to the change from a buried rock seawall to a double sheet pile structure was determined to be de minimis.

Several design changes altered the heights of the structures and were assessed for impacts to visual resources. The impacts of each design change to aesthetic/visual resources are presented in Table 29.

Contract Feature	Seawall		Levee	Levee Tide Gate
Design Change	Change from a buried rock seawall to a double sheet pile design	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Crest elevation raised from +16.9 to +17.7 feet NAVD88	Crest elevation raised from +16.9 to +19.9 feet NAVD88 for future SLC
Impact	De minimis	De minimis Note: The increase in rock crest elevation does not increase the total height of the seawall, instead it integrates the promenade/boardwalk and brings the rock crest up to the total height presented in the FEIS.	De minimis	De minimis

Table 29: Impacts to aesthetic/visual resources by design change.

Under the proposed action, the seawall rock crest elevation was raised from +19.4 feet to +21.4 feet NAVD88. In the FEIS, the rock crest elevation was designed to +19.4 feet NAVD88 with an additional timber promenade built on top, bringing the total height in the FEIS to +21.4 feet NAVD88. The increase in rock crest elevation does not increase the total height of the seawall, instead it integrates the promenade/boardwalk and brings the rock crest up to the total height presented in the FEIS. As the height of the seawall has not changed, and the additional 2 feet of rock will be covered with clean fill and seeded with vegetation where possible, the impacts to visual resources of this design change were considered de minimis.

The levee crest elevation was raised from +16.9 feet to +17.7 feet NAVD88 to allow for long-term settling due to the presence of clay layers in the soil. The levee will settle to the design height of +16.9 feet NAVD88. This design change is expected to have short-term temporary impacts to visual resources during the settling of the levee.

The levee tide gate was raised from +16.9 feet to +19.9 feet NAVD88 to account for future sea level rise. The increase of 3 feet is not a significant change and the tide gate would continue to "be a minor new landscape feature that would not attract undue visual attention within interior views" (USACE 2016a). This impacts of this design change to visual resources are considered de minimis.

5.10.4 Compliance with NEPA (Comparison to the FEIS)

Based on the above assessment, the proposed action would be within the range of impacts to aesthetic and visual resources analyzed in the FEIS. Most design changes result in de minimis impacts. The change in crest elevation of the levee results in minor,

short-term, temporary impacts as the levee settles to the design height assessed in the FEIS.

5.11 Coastal Zone Management

5.11.1 Existing Conditions

Section 3.11 of the FEIS describes the coastal zone management area. Appendix D of the FEIS (available online) discusses the State Coastal Policies and NYC's Local Waterfront Revitalization Program (LWRP) in greater detail.

5.11.1.1 Changes in the Existing Condition from the FEIS

Revisions to both the State Coastal policies and the NYC LWRP policies have been made since the publication of the FEIS. These revised policies were considered in the FEIS as proposed policies.

The State Coastal policies were revised in June 2017. The NYC LWRP policies were revised in June 2016.

5.11.2 FEIS Impacts

The FEIS concluded that the NED Plan would be consistent with the State Coastal and LWRP policies. USACE received concurrence with the consistency determination on March 30, 2016 (see Appendix D of the FEIS).

5.11.3 Proposed Action Impacts

The consistency determination was reviewed, and the design changes of the proposed action do not change the conclusions of the consistency determination. The revisions to policies noted in Section 5.11.1.1 were captured in the consistency determination.

The 2016 consistency determination (see Appendix D of the FEIS), stated that "Any future substantial modifications or additions to the proposed project are subject to further review and concurrence by the Department of State." USACE determined that the design changes were not considered substantial. The list of design changes was provided to NYSDOS in May 2023. In a conversation between USACE and NYSDOS in June 2023, the NYSDOS agree with the USACE conclusion that the design changes were not substantial and will provide a recertification to this effect.

5.11.4 Compliance with NEPA (Comparison to the FEIS)

There are no changes to the FEIS consistency determination as a result of the proposed action. Therefore, the impacts to coastal zone management are the same for the proposed action as under the FEIS.

5.12 Hazardous, Toxic, and Radiological Waste

5.12.1 Existing Conditions

Section 3.12 of the FEIS discusses HTRW present in the project area.

5.12.1.1 Changes to Existing Conditions Since the FEIS

While the Director's Report was in preparation, it was identified that there was the potential for HTRW in the vicinity of Great Kills Park. At the time the feasibility study was completed, initial testing had been undertaken by USACE, under a Support Agreement via the Interagency and International Services (IIS) Program to the National Park Service (NPS),which identified the presence of HTRW, but without enough specificity to quantify the impact to the project alignment (specifically the levee alignment running along the eastern boundary of Great Kills Park). The Director's Report acknowledged the need for HTRW removal and identified that the cost would be borne in full by the non-Federal sponsor.

Subsequent to the Director's Report Approval, NPS advanced efforts to further characterize the contamination within the Great Kills Park and continued to contract with USACE via the IIS program to undertake these efforts. This additional testing, completed in 2017, identified the presence of HTRW along the footprint of the levee, and clearly identified that a HTRW removal action would be required along the footprint of the levee, prior to construction. In advancing the PED phase of the project, the non-Federal sponsor requested that USACE include the removal action of the site as part of the levee construction contract, as a non-Federally funded line item in the contract. Subsequent coordination and clarification were provided by HQUSACE that this approach was not acceptable, due to concerns including, but not limited to, liability to USACE when contracting these efforts. Direction was given to the non-Federal sponsor that as part of their non-Federal sponsor real estate requirements, they would be responsible for implementing the necessary response efforts and would be responsible for providing the project a clean site, prior to USACE constructing the levee.

To fulfill their non-Federal requirements, and given the prior involvement of NPS, New York City will be entering into an agreement with NPS to design and implement the required response action. NPS, in turn, will execute a Support Agreement with USACE via IIS for these efforts. Upon completion of HTRW response operations, New York State and NPS[1] will provide written confirmation that the response action is complete and has achieved the stated clean site objective per ER 1165-2-132, Section 6(a)-(b) and ER 1105-2- 100, Appendix E).

Additional sampling was conducted from 2018 – 2019 and is documented in an Environmental Sampling Report (USACE 2020). A total of 42 samples were collected from 36 locations throughout the project area and were analyzed for VOCs, SVOCs, PCBs, and RCRA regulated metals and mercury. The results of this analysis found all samples to be below screening levels, with either non-detect or very low levels of detection. Surface and sub-surface waste debris was observed during sampling and was determined to be the result of unauthorized waste dumping practices.

[1] The National Park Service (NPS) has been delegated CERCLA response authority to respond to releases or threatened releases of hazardous substances on any facility under the jurisdiction, custody or control of NPS. NPS is the lead CERCLA agency for this and other response actions taken or to be taken at the Site.

A review of the EPA website did not identify additional CERCLA-regulated or NPL sites (EPA 2022). The NYSDEC Locator Mapper did not identify contaminated sites within the proposed action area (NYSDEC 2022b).

5.12.2 FEIS Impacts

Section 4.12 of the FEIS discusses the HTRW impacts of the NED Plan. The FEIS concluded that:

> "Construction activities would involve the disturbance of soil and groundwater in areas where prior uses, regulatory database searches, and testing have indicated a potential for the presence of hazardous materials in the soil and/or groundwater. At all sites where contaminated soil or groundwater might be disturbed, the USACE would implement a CHASP and RAP. In addition, all excavated soil would need to be handled and managed in accordance with all applicable City, state, and Federal regulations. Construction activities would generate minimal solid waste. Asphalt from the street raisings would be removed and disposed of or reused. Cut trees and vegetation would be mulched and may be reused to the extent practicable. The USACE would continue to closely coordinate with the NPS to ensure that there are no cross-connecting impacts between the NED Plan construction and the CERCLA cleanup of radioactive contamination at Great Kills Park. The NED Plan will not impact hazardous, toxic, and radioactive wastes materials. Any contaminated materials found would be removed and disposed of in accordance with all City, State, and Federal regulations by the local partner." (USACE 2016a).

USACE does not perform hazardous material investigations or actions to delineate or remediate soil. Implementation of a CHASP or RAP will no longer be implemented by USACE, as indicated in the above FEIS text, but is now considered a local partner responsibility. USACE will review reports documenting any hazardous material delineations or remediation to ensure the project site is "clean" prior to construction.

5.12.3 Proposed Action Impacts

The levee is the only project feature within the contaminated area of the Great Kills Park CERCLA site. USACE requires that the local partner, in accordance with the PPA, deliver a clean site and cover the cost for HTRW discovered during construction that may have been inadvertently missed. This includes full delineation and remediation of HTRW in the project footprint.

USACE will continue to closely coordinate with the local partner and NPS to ensure there are no cross-connecting impacts between the construction of the proposed action and the CERCLA cleanup of radioactive contamination at Great Kills Park. The proposed action will not impact hazardous, toxic, and radioactive wastes/materials.

5.12.4 Compliance with NEPA (Comparison to FEIS)

The FEIS concluded that the NED plan would not impact HTRW materials. Under the proposed action, the local partner is required to deliver a clean site and cover the costs of HTRW removal. The proposed action would not impact HTRW materials. The proposed action impacts are the same as those documented in the FEIS.

5.13 Transportation

5.13.1 Existing Conditions

Section 3.13 of the FEIS describes the existing transportation resources in the project area.

5.13.1.1 Changes in the Existing Condition from the FEIS

There have been no changes in the existing condition from what was described in the FEIS.

5.13.2 FEIS Impacts

The FEIS concluded that:

> "Construction activities would have short-term minor adverse effects on transportation and traffic. These effects would be primarily due to worker commutes, and delivery of equipment and materials to and from the construction sites and staging areas. In addition, road closures or detours to accommodate utility system work may be expected. Although the effects would be minor, contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate staging areas to minimize traffic impacts. Typically, construction activities and associated traffic would be conducted during normal business hours; however, construction would proceed during evening hours at certain locations where traffic or road-use restrictions would affect the schedule. Equipment would not be fixed in one location for long durations, but would progress along the construction right-of-way. Increased construction traffic would be temporary, and would subside at any particular location as construction progresses to subsequent segments of the project.
>
> The NED Plan would require both street closures and sidewalk closures during some project phases. All closures would be subject to DOT approval under a street and sidewalk construction permit, and a traffic management plan would be submitted to DOT for review and approval. Closures would be temporary and diversions would be provided. Any sidewalk closures would incorporate the appropriate pedestrian protection measures, and sidewalks would be restored as part of street reconstruction. These effects would be less than significant." (USACE 2016a).

5.13.3 Proposed Action Impacts

The only design change related to transportation resources is the addition of an access road and access at the levee tide gate. Vehicle access at the levee tide gate, and along the line of protection, is only permitted for periodic maintenance and emergency use, as presented in the FEIS. There is no public vehicular access along the line of protection. The access road at the levee tide gate will therefore not have an impact on transportation in the SSSI project area.

Impacts to traffic were considered in the FEIS, largely relating to the delivery of materials (i.e., rock). As part of design refinement, a maintenance and traffic plan will be drafted and coordinated with the local partner. As standard operating procedure, in advance of construction, the contracting officer will engage with the community and the local partner to determine delivery routes.

5.13.4 Compliance with NEPA (Comparison to the FEIS)

The FEIS determined that the NED plan would have short-term minor adverse effects on transportation and traffic. The proposed action would not result in additional impacts to transportation and traffic beyond what was documented in the FEIS. The proposed action is within the range of impacts identified in the FEIS.

5.14 Air Quality

5.14.1 Existing Conditions

Section 3.15 of the FEIS describes the existing air quality conditions in the project area. Richmond County is located within a designated non-attainment zone for 8-hour Ozone, one of the six National Ambient Air Quality Standards (NAAQS) primary pollutants (USEPA 2015).

5.14.1.1 Changes to the Existing Condition since the FEIS

There have been no changes to the existing condition since the FEIS.

5.14.2 FEIS Impacts

Section 4.15 of the FEIS describes the impacts of the NED plan to air quality. A General conformity analysis was completed during the FEIS and resulted in a Record of Non-Applicability (RONA) (see Appendix H of the FEIS; USACE 2016a). The RONA concluded:

> "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 NOx , VOC, PM2.5 , or CO for each project year (40CFR§93.153(b)(1) & (2)). The project is presumed to conform with the General Conformity requirements and is exempted from Subpart B under 40CFR§93.153(c)(1)." (USACE 2016a).

The cumulative impacts from the NED Plan were evaluated in the FEIS and were not anticipated to significantly impact climate change. The Project's emissions related to the diesel-powered construction equipment will be temporary and finite, trading minor short-term generation of greenhouse gas (GHG) emissions for the protection of both human life and the land-side environment, which are currently at risk against rising water related to hurricanes and large storms. CEQ's guidance has established a reference point of 25,000 metric tons of GHGs (in units of carbon dioxide equivalents or CO_2e) annually as a threshold for quantitative analysis of GHG emissions and climate change impact. The NED Plan and the proposed action are each anticipated to result in under

9,000 metric tons of GHG emissions, which is less than half of the reference point, so further quantification has not been performed.

5.14.3 Proposed Action Impacts

The proposed action does not require the use of marine vessels and all construction work is still anticipated to be conducted with land-based equipment. The use of land-based equipment was analyzed and documented in the FEIS (see Section 4.15 of the FEIS) and is covered under the New York State Implementation Plan (SIP).

As none of the design changes require the use of marine vessels, no design changes were individually assessed for this resource category.

As the proposed action is anticipated to result in less than 9,000 metric tons of GHG emissions, and this is less than half of the reference point established by the CEQ's guidance, further quantification of GHG emissions has not been performed.

The findings of the RONA remain applicable and additional General Conformity analysis is not necessary for the proposed action.

5.14.4 Compliance with NEPA (Comparison to the FEIS)

The proposed action has the same level of impacts to air quality as documented in the FEIS and remains consistent with the RONA. No additional General Conformity analysis is necessary.

5.15 Noise

5.15.1 Existing Conditions

The FEIS discusses the existing noise conditions in Section 3.16.

5.15.1.1 Changes to the Existing Condition since the FEIS.

There have not been changes in the existing condition since the FEIS.

5.15.2 FEIS Impact

Section 4.16 of the FEIS discusses the noise impacts of the NED Plan. The FEIS concluded:

> "Short-term moderate effects would be expected. Short-term increases in noise would be due to heavy construction activities such as pile driving and use of construction equipment during revetment activities. Increases in noise would be temporary, and subside as construction progresses to subsequent segments of the project. Although construction noise would be temporary, given the excessive among of noise on some nearby receptors, this impact would be moderate. In addition to construction equipment, limited truck and worker traffic may be audible at some nearby locations having minor adverse effects. In accordance with DEP §24-222, construction activities would be limited to weekdays between the hours of 7:00 a.m. and 6:00 p.m. without a special permit. In addition, a noise mitigation plan would be developed and submitted for approval prior to the start of work and implemented to minimize noise into nearby areas. The noise mitigation plan would include such

restrictions as specifying sites for noise generating equipment and avoiding unnecessary late night and weekend construction activities, and would be developed to address nearby schools, hospitals, and houses of worship." (USACE 2016a).

5.15.3 Proposed Action Impacts

In discussion of the proposed action with the Vertical Team, concerns were raised regarding construction related noise impacts to marine species. The line of protection is, on average, 200 feet landward of mean high water. Temporary land-based noise impacts from construction are expected to have little to no impact to marine species. These species experience higher ambient noise in their underwater environment from ships passing through than would be experienced as a result of construction. The ambient noise level of the New York harbor (with shipping) is 75-125 decibels (dB) recorded at 3 meters depth (USACE 2022c). The noise level of land-based pile driving activities is 95-105 dBA (USACE 2016a).

The FEIS analyzed the short-term effects of construction noise on noise sensitive receptors in the project area for a range of construction equipment noise levels (see FEIS Section 4.16). Of the receptors identified in the FEIS, 16 are within the proposed noise levels above 100 dBA from impact pile driving activities. The remaining receptors would be exposed to noise levels between 73-83 dBA (see Table 4-4 and Figure 4-34 of the FEIS).

Construction would not be fixed in one location but would progress along the construction right of way. Noise increases would be temporary and would subside as construction progressed along the line of protection. Although construction would be temporary, given the excessive amount of noise on several receptors, noise impacts from the proposed action would be moderate.

Several design changes result in larger quantities of material (rock, sheet pile) than anticipated in feasibility (see Table 30, Table 31, and Table 32). There may be a localized increase in noise because of the additional material. For example, a larger armor stone may be louder during placement than a smaller armor stone. However, the construction methods and materials of the proposed action are largely the same as were assessed in the FEIS. The impacts of these design changes fall within the range of construction equipment levels assessed in the FEIS. Therefore, these design changes were determined to have de minimis noise impacts.

Seawall	**Design Change**	Change from buried rock seawall to double sheet pile design	Rock crest elevation increased from +19.4 to +21.4 NAVD88	Armor stone size increase
	Impact	De minimis	De minimis	De minimis

Table 30: Impacts of the proposed action seawall design changes to noise

Floodwall	**Design Change**	~55% more armor stone along western side of OBWWTP	2.5x weight of steel for pile foundations
	Impact	De minimis	De minimis

Table 31: Impacts of the proposed action floodwall design changes to noise.

Tide Gate	**Design Change**	Additional foundation piles	Sheet pile cutoff added
	Impact	De minimis	De minimis

Table 32: Impacts of the proposed action levee tide gate design changes to noise.

Under the proposed action, the levee would be constructed in stages to allow for settling (see Table 33). This would extend the duration of construction of the levee and would therefore increase the length of time the surrounding residents would be exposed to construction noise. However, there would be breaks in between stages without construction while the levee settles, and noise would subside as construction moves along the levee. Noise from the levee construction would continue to have temporary moderate impacts, which is consistent with the FEIS. Therefore, this design change is considered de minimis in regard to noise.

Levee	**Design Change**	Staged construction to allow for settling
	Impact	De minimis

Table 33: Impacts of the proposed action levee design changes to noise.

Based on the above assessment, the proposed action will result in short-term, moderate, temporary noise increases only. This is consistent with the analysis and findings of the FEIS.

5.15.4 Compliance with NEPA (Comparison with the FEIS)

The FEIS concluded that short-term moderate temporary noise increases would be expected from construction of the NED plan. The construction materials and methods used in the proposed action are largely the same as in the FEIS. The duration of construction noise may be longer under the proposed action, as the levee would be constructed in stages. The proposed action is expected to result in short-term,

moderate, temporary noise increases because of construction. This is within the range of impacts assessed in the FEIS.

5.16 Permitting (Regulatory Compliance)

The proposed action will not require additional permitting. There is an existing Umbrella Section 401 WQC for the project (Permit No. 2-6404-01480/00004). Each construction contract for the SSSI project must submit a Request for Authorization under the WQC to NYSDEC for approval prior to construction. Additionally, there is an existing Umbrella State Pollutant Discharge Elimination System (SPDES) Permit (No. NY-02277070). Each construction contract requiring dewatering activities must submit a Request for Authorization to NYSDEC for approval under the SPDES Umbrella Permit. Prior to any work on NPS property, USACE will apply for a Special Use Permit (SUP).

6 Resulting Environmental Impacts

6.1 Summary of Proposed Action Impacts

Geology, Topography, and Soils. Construction of the proposed action would disturb approximately 276 acres (LOP: 82 acres; excavated ponds: 194 acres). This impact is quantitatively greater than in the FEIS, however, qualitatively the impact has not changed as the same soil types will be impacted by the wider seawall footprint.

Water Resources. Construction of the proposed action may result in an additional temporary, short-term increase of suspended sediments and turbidity in surrounding surface waters. The suspended sediments and turbidity are expected to settle quickly out of the water column, and therefore no long-term impacts to surface water quality are expected.

Vegetation and Wetlands. The proposed action will impact 207.09 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 23.71 acres is related to fill associated with the LOP and placement of hard structures in the interior drainage ponds resulting in a permanent loss of the existing wetlands. There are 157.47 acres of temporary impact associated with the interior drainage ponds and 17.64 acres of temporary impact associated with the construction of the tidal wetland/mosaic of habitat feature. An EPW assessment resulted in a net gain of +87.51 functional capacity units for freshwater wetlands and +6.68 functional capacity units for tidal wetlands. No compensatory mitigation is necessary, and the project maintains its self-mitigating status.

Wildlife. Construction of the proposed action would not result in additional impacts to wildlife in relation to the range of impacts assessed in the FEIS. There may be potential beneficial impacts associated with the flattened slopes of the line of protection, as it allows for easier crossing by local wildlife.

Threatened and Endangered Species. Construction of the proposed action would not result in additional impacts to threatened and endangered species in relation to the range of impacts assessed in the FEIS.

Socioeconomics and Environmental Justice. Construction of the proposed action would not result in additional impacts to socioeconomics or environmental justice communities in relation to the range of impacts assessed in the FEIS.

Cultural Resources. The proposed action would increase the risk to the Elm tree light and Hanger 38 due to the slight realignment of the seawall. However, construction of the proposed action would not result in additional adverse impacts to cultural resources from the range of impacts assessed in the FEIS. Coordination regarding minimization and/or mitigation of potential impacts is ongoing in accordance with the stipulations of the PA.

Land Use and Zoning. Construction of the proposed action would not result in additional impacts to land use and zoning in the project area in relation to the range of impacts assessed in the FEIS.

Recreation. Construction of the proposed action would not result in additional impacts to recreation in the project area in relation to the range of impacts assessed in the FEIS. There is a small increase in recreational areas due to the increased width of the promenade under the proposed action.

Aesthetics and Visual Resources. Construction of the levee under the proposed action would result in additional minor, short-term, temporary impacts to the viewshed as the levee settles to the design height. Once the levee has settled, there would be no additional impacts to viewshed in relation to the range of impacts assessed in the FEIS.

Coastal Zone Management. Construction of the proposed action would not result in additional impacts that were not captured in the previous coastal zone management consistency determination.

Hazardous, Toxic, and Radioactive Wastes. Construction of the proposed action would not result in additional impacts to HTRW in relation to the range of impacts assessed in the FEIS. The local partner will deliver the construction site free of HTRW materials and will cover the cost associated with the removal of hazardous material identified during construction. Any hazardous material would be removed and disposed of in accordance with all regulations.

Transportation. Construction of the proposed action would have short-term minor impacts to transportation and traffic. Access roads would only be utilized by maintenance and emergency vehicles and are not proposed for use by the public.

Air Quality. Construction of the proposed action would not have additional impacts to air quality in relation to the range of impacts assessed in the FEIS.

Noise. Construction of the proposed action would result in a short-term, moderate, temporary noise increase.

6.2 Comparison of Proposed Action Impacts to FEIS Impacts

The following table compares the impacts of the NED Plan as documented in the FEIS (see Table 4-5 of the FEIS) and the impacts of the proposed action as documented in this MFR.

Resource	FEIS Impacts	Proposed Action Impacts
Geology, Topography, Soils	Land disturbance: 52.8 acres for LOP, 187.2 acres for pond excavation, and 4.1 acres for road raisings.	Land disturbance: 82 acres for LOP and 194 acres for pond excavation. The same soil types will be impacted as in the FEIS.
Water Resources	Beneficial impacts to water resources, including reduced sediment and other pollutant loadings, and improved water quality in stream channels and receiving waterbodies, including the Lower Bay.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Vegetation and Wetlands	Potential beneficial removal of invasive species and subsequent replanting with native vegetation. The NED Plan will impact 144.64 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 10.89 acres is related to the fill associated with the LOP Project feature resulting in a permanent loss of the existing wetlands. There are 117.25 acres of impact associated with the interior drainage project feature (with Drainage Areas B, C, and E) being created for surface water detention as well as 16.5 acres of impact associated with the construction of the tidal wetland (mosaic of habitat) feature.	The proposed plan will impact 207.09 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 23.71 acres is related to fill associated with the LOP and placement of hard structures in the interior drainage ponds resulting in a permanent loss of the existing wetlands. There are 157.47 acres of temporary impact associated with the interior drainage ponds and 17.64 acres of temporary impact associated with the construction of the tidal wetland/mosaic of habitat feature. An EPW assessment resulted in a net gain of +87.51 functional capacity units for freshwater wetlands and +6.68 functional capacity units for tidal wetlands. No compensatory mitigation is

		necessary, and the project maintains its self-mitigating status.
Wildlife	Improved habitats could benefit wildlife, including avian and water dependent species.	No additional impacts in relation to the range of impacts assessed in the FEIS. Potential beneficial impact associated with the flattened slopes of the LOP allowing for easier crossing by local wildlife.
Threatened and Endangered Species	No additional impacts from the NED plan.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Socioeconomics and Environmental Justice	Coastal storm risk management would improve and potential housing impacts from storms would decrease considerably. NED Plan would result in positive impacts to all individuals in the Project area.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Cultural Resources	The NED plan would have adverse effects on the NNRHP-listed Miller Feld Army Airfield Historic District, including the potential demolition of the WWII fire tower and visual impacts to the Elm tree light, and Hangar 38.	Additional risk to the Elm tree light and Hanger 38 associated with the construction of the proposed action.
Land Use and Zoning	NED Plan would preserve existing open space for habitats and stormwater management. NED Plan compatible with land uses.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Recreation	NED Plan would maintain, protect, and preserve existing parks and other recreational facilities.	No additional impacts in relation to the range of impacts assessed in the FEIS. Potential increase in recreational areas due to increased width of promenade.
Aesthetics and Visual	LOP would blend with surrounding landscapes. Excavation would result in increased open water/vegetation views. Miller	Additional minor, short-term, temporary impacts to viewshed from the levee as the levee settles to the design height assessed in the FEIS.

	Field views to sea could be obstructed and demolition of the fire tower, Elm Tree Light, and alteration of Hangar 38 could change the visual character.	
Coastal Zone Management	Consistent with State CMP and NYC's LWRP policies.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Hazardous, Toxic, Radioactive Material	Any hazardous materials discovered through construction would be removed and disposed of in accordance with all regulations.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Transportation	Minimal construction traffic impacts. Road raisings would require street closures and traffic flows would be temporarily affected.	Minimal construction traffic impacts. Access roads would only be used by maintenance and emergency vehicles.
Air Quality	No change from current status.	No additional impacts in relation to the range of impacts assessed in the FEIS.
Noise	Localized temporary noise increases typical of construction. No blasting required. Pile driving vibrations would be monitored.	Localized temporary noise increases typical of construction. No blasting required. Pile driving vibrations would be monitored.

Table 34: Summary comparison of the NED Plan and the proposed action

6.3 Compliance Table

Federal Statutes	Level of Compliance[1]
Anadromous Fish Conservation Act	N/A
Archeological and Historic Preservation Act	TBC
Clean Air Act	Full
Clean Water Act	Full
Coastal Barrier Resources Act	N/A
Coastal Zone Management Act	Full
Comprehensive Environmental Response, Compensation and Liability Act	Full
Endangered Species Act	Full
Estuary Protection Act	N/A
Federal Water Project Recreation Act	N/A
Fish and Wildlife Coordination Act	Full
Land and Water Conservation Fund Act	N/A

Marine Mammal Protection Act	Full
National Historic Preservation Act	TBC
National Environmental Policy Act	Full
Resource Conservation and Recovery Act	N/A
Rivers and Harbors Act	Full
Watershed Protection and Flood Prevention Act	N/A
Wild and Scenic Rivers Act	Full
Executive Orders, Memoranda, etc.	
Migratory Bird (E.O. 13186)	Full
Protection and Enhancement of Environmental Quality (E.O. 11514)	Full
Protection and Enhancement of Cultural Environment (E.O. 11593)	Full
Floodplain Management (E.O. 11988)	Full
Protection of Wetlands (E.O. 11990)	Full
Prime and Unique Farmlands (CEQ Memorandum, 11 Aug. 80)	N/A
Environmental Justice in Minority and Low-Income Populations (E.O. 12898)	Full
Protection of Children from Health Risks & Safety Risks (E.O. 13045)	Full

Table 35: Environmental compliance of the proposed action

[1]Level of Compliance:

Full Compliance (Full): Having met all requirements of the statute, E.O., or other environmental requirements for the current stage of planning.
To Be Completed (TBC): Compliance will be completed when funds are authorized to progress into the next phase of work.
Non-Compliance (NC): Violation of a requirement of the statute, E.O., or other environmental requirement.
Not Applicable (N/A): No requirements for the statute, E.O., or other environmental requirement for the current stage of planning.

7 Conclusion

The assessment of each design change of the proposed action resulted in minor, de minimis, beneficial, or no significant impacts to the resources. No adverse significant impacts were identified. The results of this analysis are within the range of impacts identified in the FEIS. The District has determined that this MFR is sufficient environmental documentation and that no additional NEPA documentation is necessary.

8 List of Preparers

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