

Appendix K
Responses to Agency Comments on the pFEIS

A. INTRODUCTION

A preliminary Final Environmental Impact Statement (pFEIS) was prepared to address refinements made to the project, as well as all substantive comments made on the DEIS during the public review period. The pFEIS was circulated to cooperating, involved and interested agencies for review, and additional consultation was subsequently conducted based on comments received. The following presents a summary of the comments received on the pFEIS and provides a response to each.

B. COMMENTS AND RESPONSES

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)

Comment 1: The Section 404(b)(1) guidelines require that aquatic fills first be avoided, and then minimized. Once the fill has been minimized to the greatest practicable extent, the issue of mitigation should be addressed. As such, and given the large footprint (11+ acres) of the offshore structures, we recommend inclusion of a discussion addressing why options that would occupy smaller footprints and convert less bay bottom to rock and concrete were not considered. Such options may include submerged sills, Beachsaver Reef™, concrete A-Jacks, steel sheet piling and floating wave attenuators.

Response: Chapter 1, “Purpose and Need and Alternatives” has been updated to include consideration of additional strategies that would occupy smaller footprints such as those described in the comment.

Comment 2: We also encourage the inclusion of a discussion of any similar projects that have been carried out at other locations. This would ideally include a review of successes and challenges, as well as a plan to address hurdles experienced. If success has not been demonstrated elsewhere, a phased or adaptive management approach to construction may be appropriate. Given the large number of variables associated with the project, a phased approach, which would allow for evaluation and possible modification between phases, might help increase the probability of success of the project as a whole.

Response: Chapter 9, “Natural Resources” and the EFH analysis for the Proposed Actions (see Appendix E-12) have been updated to include results of empirical studies

that examined colonization of newly placed rock material and eco-concrete and fish utilization of porous rock structures.

Construction of the breakwaters system is assumed to begin with the southwestern most location and, generally, proceed from southwest to northeast. This sequential construction of the breakwaters would allow colonization to begin at the first completed segments while the rest are being constructed, minimizing the period during which sand and gravel foraging habitat would be lost and prey species would not be available on any of the structures. Foraging opportunities would also continue to be available in the surrounding soft-bottom habitat during this time.

There are three types of breakwaters proposed, grouped and positioned to serve a specific purpose (nine segments in total). The system would operate as a whole to achieve the wave attenuation and erosion goals of the project's purpose and need. Phased construction to allow for the results of ecological monitoring would not meet the purpose and need of the project with respect to the resiliency goals and would not be practicable. However, ecological monitoring will commence following construction and an adaptive management plan will be in place. Section 9.6 of the FEIS discusses the establishment of a Monitoring Plan and Adaptive Management Plan for the proposed project. These plans will be more fully developed in consultation with NYSDEC, NMFS and USACE during the permitting process.

Comment 3: The FEIS does not fully demonstrate that the breakwaters will be “self-mitigating” and that they will provide an increase of the site’s current ecological value. Nor are the criteria that will be used to evaluate this assertion identified. The FEIS should include a post-construction ecological monitoring and assessment protocol, with quantitative project performance goals and regional reference location(s) for comparison with assessment results. An adaptive management approach would provide this.

Response: Section 9.6 of the FEIS discusses the establishment of a Monitoring Plan and Adaptive Management Plan for the proposed project. The Adaptive Management Plan will evaluate if post-construction measurements of community structure (based on the results of the Monitoring Plan) for hard-bottom community, benthic invertebrate community and fish community are statistically different, and if so, further evaluation of species richness and abundance will be conducted to determine the direction, magnitude, and reason for the difference (e.g., species composition, abundance) and whether adaptive management measures should be implemented. These plans will be more fully developed in consultation with NYSDEC, NMFS and USACE during the permitting process. Additionally, as per NOAA’s EFH consultation letter (dated May 8, 2018), NOAA/NMFS have concluded that “the revised EFH assessment adequately evaluates how the project components, both individually and cumulatively, will affect federally managed

species, their EFH, and the ecology of Raritan Bay. The construction of the breakwater system will result in a conversion of 11.4 acres of benthic habitat and the concomitant 115,990 cy of water column above the substrate to an equivalent area and volume of rocky/hard structure habitat.”

Comment 4: Additionally, if not already included, we recommend the addition of an estimate of the total hard surface area (i.e., horizontal and vertical) that will be available for colonization by sessile macroinvertebrates such as barnacles, mussels, tunicates, bryozoans, and anthozoans. Compare that estimate to the total breakwater footprint (approx. 11 acres).

Response: While the surface area is not separated out as horizontal and vertical, Appendix E-11 provides estimates of the planar and void areas created in comparison to the area occupied by footprint of the breakwater structures.

**U.S. DEPARTMENT OF THE INTERIOR—U.S. FISH AND WILDLIFE SERVICE
(USFWS)**

FEDERALLY-LISTED AND ENDANGERED SPECIES

Comment 5: Currently, there are no records of endangered species in the project area. However, shoreline restoration and the installation of breakwaters may increase the width of beach in the project area. Wider beaches may attract nesting or migratory shorebirds including the piping plover (*Charadrius melodus*) and/or red knot (*Calidris canutus*). Piping plovers nest on beaches in the nearby area at Sandy Hook, New Jersey, and Breezy Point, New York, and red knots have been documented on other beaches and coastal areas on Staten Island and Jamaica Bay, New York. Following our comments on the DEIS, GOSR/HUD has committed that the New York City Department of Parks and Recreation would undertake protection efforts if piping plovers were to be attracted to the project area as a result of the project (see FEIS page 9-104). The Service supports this effort, and thinks that this measure should be added to the list of mitigation measures put forth in Chapter 9 (pages 9-109 through 9-110) and in Chapter 20. Furthermore, GOSR/HUD may consider working with local partners to develop post-construction surveys for red knots to determine the response of this species to the project as results may help to inform future breakwater projects.

Response: Comment noted. This information has been added to the referenced Chapters.

MIGRATORY BIRDS

Comment 6: The DEIS identifies a number of migratory and probable breeding bird species within the study area. The installation of the earthen berm, hybrid dunes, eco-revetment, raised edge, and water hub will occur in maritime beach and dune, successional forest, and southern hardwood habitats that may support these

nesting or migratory birds. Following coordination with the Service during the DEIS, GOSR/HUD has committed that project elements requiring tree-clearing will be scheduled outside of the early May through July primary bird-breeding season, to the extent practicable. If construction activities requiring tree-clearing are necessary during April or August, GOSR/HUD will coordinate with the Service in respect to conducting active nest surveys that may support tree-cutting during this period. The Service supports this effort to avoid or to reduce impacts of construction during critical nesting periods. Secondly, to further enhance habitat for migratory birds and reduce human impacts, GOSR/HUD may also consider engaging with local partners to develop interpretive programs and signage to educate the public about nesting and migratory birds in the project area, particularly in areas that provide both wildlife habitat and recreational opportunities for people.

Response: Comment noted.

WETLANDS AND ESTUARINE ENVIRONMENT

Comment 7: The installation of the breakwaters will adversely impact 11.4 acres (ac) of estuarine, subtidal, unconsolidated bottom. The installation of the breakwater structures would result in the replacement of 11.4 ac of subtidal and sand gravel aquatic habitat with subtidal, intertidal, and emergent hard/rocky habitat composed of rock and bio-enhancing concrete of varying sizes. We recommend that GOSR/HUD coordinate with the New York State Department of Environmental Conservation and other appropriate agencies to ascertain whether mitigation is appropriate for conversion of habitats in this area and to develop a biological monitoring protocol to assess and ensure adequate ecological function of the breakwaters.

Response: GOSR has actively coordinated and will continue to coordinate with agencies for comments on impacts/mitigation as part of EIS and permitting process including DEC. Additionally, Section 9.6 of the FEIS discusses the establishment of a Monitoring Plan and Adaptive Management Plan for the proposed project. These plans will be more fully developed in consultation with NYSDEC, NMFS and USACE during the permitting process.

Comment 8: The proposed project also includes the installation of a path and bridge to connect the earthen berm to the proposed hybrid dunes. The installation of these project elements will cause a loss of 0.14 ac of a 0.8 ac unmapped tidal wetland. To mitigate for this loss, GOSR/HUD proposes to enhance the remaining wetland by increasing tidal exchange by removing an existing sand bridge and culvert comprising unpermitted fill that is currently restricting tidal flow. Two-thirds of the wetland is reportedly dominated by common reed (*Phragmites* spp.), including the impacted area, and the increase in tidal flow is expected to restore

a more natural wetland community. The FEIS should address how successful mitigation would be measured or monitored.

Response: The FEIS has been updated to include the removal of phragmites and re-establishment of native saltmarsh plant species in addition to the removal of the existing sand bridge and culvert as part of the enhancement of the remaining wetland. Section 9.6 of the FEIS discusses the establishment of a Monitoring Plan and Adaptive Management Plan for the proposed project. These plans will be more fully developed in consultation with NYSDEC, NMFS and USACE during the permitting process. Wetland monitoring will be in accordance with New York State Salt Marsh Restoration and Monitoring Guidelines.

INVERTEBRATES

Comment 9: Horseshoe crabs (*Limulus polyphemus*) and horseshoe crab eggs have been documented at beaches within the study area. The [p]FEIS proposes to avoid construction and sand placement between Manhattan Street and Loretto Street during peak spawning season (late May to early June). The FEIS also anticipates that sand placement would be avoided early January through late May to avoid spawning winter flounder. This additional restriction would also benefit horseshoe crabs. We support these time-of-year restrictions. Following our comments on the DEIS, GOSR/HUD committed that material used for the restoration of the beach will be similar in composition to existing sand substrate within the beach and Conference House Park (Page 9-84). This would help to reduce impacts to horseshoe crabs and, as such, the Service supports this measure. We recommend that this measure is also included in the list of mitigation measures presented in Chapter 9 (pages 9-109 through 9-110), and in Chapter 20, as a mitigation measure for horseshoe crabs and for the timely recovery of other macroinvertebrate species.

Response: This measure has been included in the referenced chapters of the FEIS.

NATIVE PLANTINGS

Comment 10: The FEIS states that native coastal plant species will be used for the Shoreline Project and Water Hub elements of the projects. We support this ecologically beneficial component of the project. We note that for successful establishment of native plants at the project location and for the maximum benefit to pollinator species, it is best to use genetically-diverse and locally-sourced plants for plantings.

Response: Comment noted.

COASTAL HABITATS

Comment 11: There are three potential locations discussed in the DEIS for the proposed Water Hub. ‘Potential Location 1’ would require the construction of a new 5,000-square-foot (sq ft) facility and 35,500 sq ft of site improvements, including a parking lot, landscaping, a seasonal boat launch, and other elements. ‘Potential Location 2’ would reuse one of two already-existing structures, and would involve the installation of accessible pathways and ramps, a 400-sq-ft building, and wayfinding and interpretive elements along the shoreline. ‘Potential Location 3’ would involve a vessel that periodically visits the project area, installation of a 400-sq-ft building, and wayfinding and interpretive elements along the shoreline. Overall, to reduce the impacts of the project on native habitats, the location of the Water Hub should be assessed to avoid additional buildings and parking lots in existing natural areas and consideration should be given to the potential reuse of previously developed sites not prone to flooding, or to options that limit the addition of new structures.

Response: Comment noted.

ADAPTIVE MANAGEMENT

Comment 12: A monitoring plan should be included in the referenced adaptive management plan to evaluate the success of and potential modifications to these resiliency projects as they relate to natural resources. Adaptive management should also include a corrective management plan should any proposed mitigation not achieve its intended purpose.

Response: Section 9.6 of the FEIS discusses the establishment of a Monitoring Plan and Adaptive Management Plan for the proposed project. These plans will be more fully developed in consultation with NYSDEC, NMFS and USACE during the permitting process. The Adaptive Management Plan will reference the need for corrective measures and consultations if needed based on post-construction monitoring results.

**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
(NOAA)/NATIONAL MARINE FISHERIES SERVICE (NMFS)**

Comment 13: Previously we provided comment letters (attached) on the draft environmental impact statement (DEIS) (May 8, 2017) and the draft EFH assessment (May 22, 2017). Although informal coordination was initiated by project consultants/contractors subsequent to the submission of the latter comment letter, comments from those letters and responses addressing the comments were not included in the dFEIS in Chapter 24, Responses to Comments on the DEIS.

Response: While NMFS did not provide comments directly on the DEIS, Chapter 24 “Responses to Comments on the DEIS,” includes comments received on the Draft EFH assessment.

Comment 14: It does not appear that a full and complete analysis of alternatives was undertaken for this project in accordance with the requirements of the National Environmental Policy Act (NEPA). Other alternatives may exist that fulfill the project purpose but would result in fewer or less significant impacts to the aquatic environment. To comply with NEPA requirements, a full and complete alternatives analysis should be conducted to comprehensively evaluate less impactful project alternatives.

Response: Chapter 1, “Purpose and Need and Alternatives” includes an analysis of various coastal strategies and design alternatives that were eliminated from further consideration (and the reasons for why they were determined not to be practicable) as well as the alternatives that have been evaluated throughout the EIS for each technical analysis area. Additional strategies have been included and evaluated in Chapter 1 in consultation with USACE and NMFS.

Comment 15: While the EFH assessment evaluated adequately some of the impacts of the project on EFH and federally managed species, we disagree with the statement that the breakwater will only result in temporary impacts to benthic habitat in the footprint of the breakwater. The breakwater will result in permanent impacts to EFH for federally managed species such as winter flounder and other species that use unvegetated, non-structural bottom. The benthic habitat will be converted to rocky reef/hardbottom. This type of habitat is EFH for other species such as black sea bass. As a result, the project will result in the permanent conversion of habitat from one type of habitat and EFH to another. It will be more suitable for some species, but less so for others.

Although the current habitat will be converted to rocky reef/hardbottom as a result of this project, there will be a temporal loss in function of the new habitat until full colonization of the breakwater by new ecological communities occurs. This loss should be fully evaluated, along with efforts to avoid, minimize and mitigate for the loss.

Response: Chapter 9, “Natural Resources” and Appendix E-12 – EFH Assessment have been revised to address the permanent nature of the conversion of habitat type from soft bottom to hard bottom and the temporal loss and function referenced in the comment. As per NOAA’s final EFH consultation letter dated May 8, 2018, NOAA/NMFS has concluded that “the revised EFH assessment adequately evaluates how the project components, both individually and cumulatively, will affect federally managed species, their EFH, and the ecology of Raritan Bay.”

Coastal and Social Resiliency Initiatives for Tottenville Shoreline FEIS

Comment 16: Because part of the breakwater system will be above mean high water and should be considered upland, that part of the total area will be lost to NOAA resources. That area of loss should be quantified and appropriate efforts to avoid, minimize and mitigate for the loss should be evaluated.

Response: Chapter 9, “Natural Resources” and Appendix E-12 – EFH Assessment have been revised to address the aquatic habitat that would no longer be available to aquatic organisms due to the portion of the breakwater structures above MHW. As per NOAA’s final EFH consultation letter dated May 8, 2018, NOAA/NMFS states that “the mitigation plans should be developed in accordance with federal final mitigation rules published in the Federal Register on April 10, 2008 (33 CRF Chapter 2 Part 332.4 (b)) and provided to us for review.” Conceptual measures to mitigate this loss have been included in the FEIS and the Conceptual Mitigation Plan being prepared as part of the permitting process will be provided to NOAA/NMFS for review.

Comment 17: As part of the post-monitoring plan for the breakwater, we recommend that several species diversity analyses (e.g. Shannon-Wiener, Simpson, Pielou’s, etc.) and community ecology statistical analyses be used to evaluate changes in diversity and community structure of the rocky reef/hardbottom invertebrate and vertebrate fauna. Similar analyses should be conducted on the pre-build surveys from 2015 and 2017 for comparison.

Response: Comment noted. The post-construction Monitoring Plan for the project will be developed in consultation with NYSDEC, NMFS and USACE as part of the permitting process, during which these types of diversity analyses will be considered. As per NOAA’s final EFH consultation letter dated May 8, 2018, NOAA/NMFS recommends that “a five year post-construction environmental and natural resource monitoring plan should be developed for their breakwaters and annual monitoring reports should be provided to our office for the duration of the plan.” These recommendations will be included in the project’s monitoring plan.

Comment 18: For the Shoreline component, opening up of the inlet to allow tidal flow into the 0.8 acre wetland to passively enhance/restore the *Phragmites australis*–dominated tidal marsh community is not acceptable mitigation for the loss of wetland habitat. As *P. australis* is difficult to eradicate solely by modifying tidal flow, we recommend that the applicant conduct an active restoration by removing all *P. australis*, modifying the elevation as appropriate for low tidal marsh, and planting native species, e.g. *Spartina alterniflora*.

Response: Comment noted. The FEIS has been updated to include the removal of phragmites and re-establishment of native saltmarsh plant species as part of the enhancement of the delineated wetland. As noted in NOAA’s final EFH consultation letter dated May 8, 2018, “This wetland loss will be offset by the restoration and

enhancement of the remaining wetland, including removal of unpermitted fill to improve hydrology, removal of the existing population of *Phragmites australis*, and planting of native salt marsh vegetation.”

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
(NYSDEC)**

CHAPTER 10 — FLOODPLAINS AND CEHA:

Comment 19: It would be helpful to show the CEHA line on the Figure 10-1 and 10-3. Please consider adding this detail.

Response: This revision has been made in the FEIS.

Comment 20: 10.3.2 Coastal Erosion Hazard Area (CEHA): "NYSDEC is updating the CEHA and the boundaries in the study area are subject to change prior to implementation of the Proposed Actions." This reads that the new CEHA maps will be completed before project implementation, which is highly unlikely. We recommend removing or modifying this statement.

Response: This revision has been made in the FEIS.

Comment 21: 10.4.2 Alternative 2: Review of the historical aerial photos reveals that the stormwater outfall at Lorretto St acted as groins and may have caused the erosion between Manhattan St and Lorretto St. Was this considered in the model used to design of the sand placement and breakwater system?

Response: The presence of the outfall was interpreted to likely have had an effect on the historic observed erosion pattern at this location, and was considered in the siting of the proposed shoreline restoration. Observation and modeling indicate that the general direction of long-shore transport is from the northeast to the southwest, and so the historically observed pattern of “updrift” accretion and “downdrift” erosion around the outfall at Loretto street is consistent with the outfall acting like a “groin” and preventing sediment movement around it, depriving the downdrift area of sand and causing it to erode. This factored in the proposed one-time placement of sand on the stretch of shoreline southwest of the outfall. The shoreline change model used to model the breakwaters was also calibrated to the historic observed conditions. A description of the calibration process and parameters can be found in the baseline and 30% design modeling reports.

CHAPTER 17 — CONSTRUCTION:

Comment 22: The provision that was previously included for "beneficial use" has been modified since the previous review of the DEIS. The citation for beneficial had been 6

NYCRR Part 360-1.15, but it is now 6 NYCRR Part 360.12. Please correct this citation.

Response: This revision has been made in the FEIS.

Comment 23: There is a new provision added at 360.13 titled "Special requirements for pre-determined beneficial use of fill material". This may give additional options for the re-use and management of material, which were not previously available under the previous regulation. Where appropriate, the program is trying to maximize the opportunities for reuse of fill materials that would otherwise end up going for disposal - these options are identified in this new section of the regulations. The new section also puts specific requirements/conditions on the re-use of fill, which must be completed prior to material re-use.

6 NYCRR Part 364 "Waste Transporters" has been revised. This is not a regulation which was specifically included in the DEIS, but due to the changes in the regulation it should be referenced. The regulatory change added here that is directly applicable is that, in short, fill material transport over a roadway must be by a Part 364 registered or permitted transporter, with all the requirements that go along with this.

Response: These revisions have been made in the FEIS.

Comment 24: 17.2.2 State: We recommend modifying the citations to include the following:

- i. Revise: Solid Waste Management Facilities, General-Pf-Gvisio467 Beneficial Use 6 NYCRR Part 360 1.15 360.12
- ii. Add: Solid Waste Management Facilities, Special Requirements for Pre-Determined Beneficial Use of Fill Material 6 NYCRR Part 360.13
- iii. Add: Waste Transporters, 6 NYCRR Part 364\

Response: These revisions have been made in the FEIS.

NEW YORK STATE DEPARTMENT OF STATE (NYS DOS)

WATER HUB

- Comment 25:**
- a. If Alternative 3 (floating hub) is selected, will residents on Staten Island be able to access the vessel at or near the project site, or do they have to travel to NYC to board?
 - b. How does Alternative 3 (floating hub) benefit the immediate community?
 - c. While we have questions about Alternative 3, having a mobile community facility may be more beneficial in the longterm than a fixed location like Alternative 2, which is somewhat remote and out of sight of the breakwaters and shoreline elements.

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Response: Comment noted. The FEIS has been revised to clarify that the vessel would serve local groups and community members when docked locally.

Comment 26: Please update graphics in Purpose and Need to identify some of the constructed on-shore elements proposed at the terminus of Page Ave.

Response: Figures 1-10 through 1-15 provide plan views and sections of the proposed Water Hub elements at Page Avenue.

FLOODING RISK

Comment 27: Chapter 11, “Water and Sewer Infrastructure” includes the results of a new Seepage Study in response to DEIS comments from the New York Departments of State (DOS) and Environmental Conservation (DEC). The chapter states that if a storm surge overtops the shoreline system, areas located at elevations +8 NAVD88 or lower could be inundated for approximately 1.5 hours. Please clarify the following:

- a. Are any residences located at elevations below +8 NAVD88?
- b. What water depths could be observed in these locations?
- c. Consider providing a graphic depicting areas that could be inundated during this scenario.

Response: There are residences that are located at elevations below +8 NAVD88. As in existing conditions, based on an evaluation of existing land elevations, water depths at these locations could be up to approximately 2 feet (from approximately +6 feet NAVD88 to +8 feet NAVD88). While additional modeling regarding seepage and drainage will be conducted in consultation with NYCDEP during 60 percent design, a preliminary analysis of the site conditions based on best available information indicates that the majority of the area currently less than +8 NAVD88 would experience similar storm surge retention time under conditions with the Proposed Actions as it does under existing conditions for events that overtop the shoreline protection system. For cases that would not overtop the proposed shoreline protection system but would inundate existing topography, it is anticipated that proposed conditions will lead to overall less retention time.

VISUAL RESOURCES

Comment 28: a. Would Aids To Navigation (ATONs) require lighting?
b. If so, identify how many lighted buoys may be needed. Provide night-time simulations. Explain how the lights would be powered and describe maintenance procedures and effects.

Response: The type and location of the navigation aids will be provided in accordance with federal regulations for the structure's classification, upon submission of the joint permit application to the U.S. Army Corps of Engineers (section 10).

RECREATIONAL USE

Comment 29: a. Chapter 2 was updated to provide information on existing recreation uses, but does not provide magnitude of existing boating activity (e.g., seasonally high, year-round low use).

b. Chapter 2 states that the projects are not anticipated to “substantially increase visitation rates.” What is the basis of this conclusion? Large infrastructure projects are novel and can attract new users, particularly in the years immediately following construction. This information could be provided as part of the permit application resubmission.

c. Additionally, the analysis in Chapter 2 concludes that increases in recreational boating and fishing “are not expected to be substantial.” What is the basis of this conclusion? We anticipate the breakwaters will attract recreational fishing, boaters, and possibly charter fishing boats, kayakers, or even swimmers. We would like the potential for these uses to be addressed. Again, this information could be provided as part of the permit application resubmission.

Response: Comment noted. This information can be provided during the permitting process.

NAVIGATION

Comment 30: a. Please describe whether shoaling south of the breakwaters could be expected.

b. Could shoaling result in any change to maintenance dredging schedules, quantities, or material type?

c. Several locations in the pFEIS (for example, see Page B-5) indicate that navigation aids and updated navigation charts will help boaters avoid the breakwaters. Once constructed, DOS suggests making georeferenced data of the breakwaters, including the full extent of the reef ridges, electronically available for download so that the boating and fishing community can upload this information to their on-board GPS units. Fliers identifying updates to the navigation charts and/or flash drives with georeferenced site data could also be provided at nearby marinas. These and similar measures have been voluntarily undertaken by developers for other large, in-water infrastructure projects to minimize risk of boat strikes and strandings.

Response: Sediment transport simulations performed using the DELFT 3D suite of models indicate that the breakwaters potential impacts on increases or decreases in bed levels will largely be limited to the area at/around the shoreline. This modeling indicates that there will be negligible to no impact to sediment erosion or

deposition in and around the channel as it lies well outside the influence region of the breakwaters.

Based in the DELFT 3D modeling, there is negligible to no impact to sediment erosion or deposition in and around the channel anticipated due to construction of the breakwaters, and no change in maintenance dredging schedule, quantities, or type is anticipated.

NOAA is responsible for the navigation charts. They issue critical corrections and routine corrections. Construction of the breakwaters would merit a critical correction. The as-built drawings or surveys (which should be done upon completion of construction) will be provided to NOAA and the US Coast Guard. That information is then translated to the charts which are disseminated electronically via an updated chart. Mariners would be notified of the correction through a notice to mariners. During construction the Coast Guard would be notified and there would be a separate notice to mariners about ongoing construction operations.

NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION (NYCDEP) AND NYC DEPARTMENT OF PARKS AND RECREATION (NYC PARKS)

CHAPTER 11, "WATER AND SEWER INFRASTRUCTURE"

Comment 31: Explain how the sedimentation would not affect storm outlets and outfalls.

Response: Sediment transport modeling of the larger project area indicates that the breakwaters will alter sediment movement at the shoreline. The breakwaters are not intended to address any existing sedimentation issues that may be occurring at the outfalls without the project. The areas around the outfalls will be studied in more detail during final design, and as described in Chapter 11, the Breakwaters Project are not anticipated to interfere in the current functionality of the existing NYCDEP outfalls (maintained by NYCDEP in accordance with current maintenance practices and future practices under the NYC Stormwater Management Program Plan [Draft for public review, April 2018], to be implemented pursuant to NYC's Municipal Separate Storm Sewer Systems [MS4] permit).

Comment 32: Page 11-2 and 11-8: Suggest rewording to "Therefore, the Proposed Actions would not result in increased sedimentation of the outfalls or any significant adverse impacts to the operation of the stormwater outfalls on Loretto Street, Sprague Avenue, Joline Avenue, and Bedell Avenue."

Response: The original language has been modified since the pFEIS to accurately reflect the analysis conclusion.

Coastal and Social Resiliency Initiatives for Tottenville Shoreline FEIS

Comment 33: Page 11-2 And 11-8: Suggest rewording to "Comprised of a series of porous structures (earthen berm, eco-revetments, hybrid dune/revetment, and raised edge) the Shoreline Project would allow water to seep through, either from the upland side to the Raritan Bay side, or from the Raritan Bay side to the upland."

Response: This revision has been made in the FEIS.

Comment 34: Page 11-3: [Regarding the maximum 28,500 cubic feet of retained freestanding water] what is the approximate area of inundation? Where along the shoreline would the 1,056 CY of water would collect, and does it fall within public property or public and private property? How long would it take to the 1,056 CY to drain if there were no shoreline protection structures?

Response: The approximate area of inundation (under current conditions and conditions with the proposed actions) has been estimated to be approximately 16 acres. This area, where freestanding water would be retained upland of the proposed embankment structures, lies between the Elevation +8.0 NAVD88 contour and the proposed project alignment, and includes public and private properties. Additional analysis of existing conditions and conditions with the Proposed Actions will be coordinated with NYCDEP in subsequent stages of the design process.

Comment 35: Is there storm surge condition under which [any storm surge water captured by the City's drainage/stormwater system] would even occur?

Response: It is possible that storm surge would be captured by the City's stormwater drainage system in a condition when storm surge overtops existing storm drains. This scenario exists with or without the proposed project. To isolate the effects of the Shoreline Project structures on drainage, the current drainage/stormwater system's influence on the water levels and drainage rates through the Project structures is assumed to be negligible. By excluding the existing infrastructure in the seepage analysis, the worst-case effect of any upland water retention is identified.

Comment 36: This begs the question as to whether or not there are any ways to mitigate the backflow flooding condition (i.e. install tide gates). Were tide gates analyzed to see if it was beneficial for this project?

Response: The backflow flooding condition, as well as any measures to address this condition were not analyzed, as changes to the City's drainage/stormwater system do not fall within the scope of this project. However, further studies are being coordinated with NYCDEP for subsequent phases of the design of the Shoreline Project.

Comment 37: Page 11-5: Revise the "42-inch diameter" parenthetical note to "48 inch diameter."

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Page 11-6: Revise the “13 ft by 5 ft 6 inch” to “13 ft 6 in by 5 ft”

Page 11-8: Suggest rewording [the second sentence of the fourth full paragraph] to “However, with the Shoreline Project, as long as storm surge conditions do not exceed +8.0 feet NAVD88, the structures would serve to delay water inundation to the land side, based on the seepage rate calculated for the structures.”

Suggest rewording [the last sentence on the page to the following:] "For storm surge conditions where Raritan Bay water elevation exceeds +8 feet NAVD88 (i.e. the raised edge structure would be overtopped), the volume of water behind the shoreline structures would remain in place until the water level on the Bay side recedes, at which point that water would seep through the structures towards the Bay."

Response: These revisions have been made in the FEIS.

Comment 38: Page 11-9: Why not account for the time it takes for the storm surge to recede when determining the time it takes for the water from the land side to get back to the bay?

Response: The range of the tidal cycle plays a significant role in recession time of storm surge from peak levels to MHW. Based on a review of data from a range of past storm events (from 1944 through 2017 [and including Superstorm Sandy]), recession time would be anticipated to be less than 6 hours in most cases. This would occur with or without the proposed project.

Comment 39: [Regarding the last sentence on the page, NYCDEP notes that] measures [to avoid potential impacts to the stormwater infrastructure where stormwater outfalls intercept the Shoreline Project footprint] should be known and disclosed in the EIS. The dunes have potential to block stormwater drainage. For those streets sloped towards the beach, the dune may prohibit drainage and possibly cause flooding during rain events at those street ends.

Response: A seepage analysis of the proposed project at 30% design was conducted to better understand the Shoreline Project’s potential to retain water on the landward side of the system. The results indicate little risk to blocking stormwater drainage to the beach from the landward side of the system due to the porous nature of the structures.

Comment 40: Who is paying for and maintaining the green infrastructure?

Response: Any proposed green infrastructure would be located on NYC Parks property and NYC Parks would be responsible for maintenance.

Comment 41: Any DEP infrastructures (manholes, sewer structures, chambers) under the berm need to be elevated to the proposed berm elevation or relocated upstream or

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downstream of the berm. Any replaced/modified structures have to meet DEP's structural requirements.

Response: Review of any design plans to elevate or relocate any NYCDEP infrastructure will be coordinated with NYCDEP during the 60% design phase.

Comment 42: Provide structural calculations for the outfall pipes located under the proposed dunes/berm.

Response: Review and feedback of structural calculations of the Shoreline Project on the existing outfall pipes located under the proposed project alignment will be coordinated with NYCDEP during the 60% design phase.

Comment 43: Access to DEP vehicles must be provided for DEP's infrastructure (outfalls) maintenance purposes.

Response: Review of design plans for NYCDEP access will be coordinated with NYCDEP during the 60% design phase.

Comment 44: Does the seepage analysis account for the potential "clogging" of embankment structures that could influence the seepage rates over time?

Response: For the seepage analysis, conservative permeability values were selected (lower permeability values) in order to incorporate possible variations in the material properties. In the structures where the section would consist of rockfill, the probability to have a clogging condition that may impact the permeability of those structures is considered low. Maintenance may be required, in particular if materials different from those used to construct the structure are identified, such as natural materials that might be transported due to different conditions (e.g. wind, waves, etc.). Operations and maintenance for the proposed embankment structures will be addressed as the design progresses.