

Appendix B
Coastal Management Program Assessment

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's Coastal Zone, must be reviewed and assessed for their consistency with the [New York City Waterfront Revitalization Program](#) (WRP) which has been approved as part of the State's Coastal Management Program.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, the New York City Department of City Planning, or other city or state agencies in their review of the applicant's certification of consistency.

A. APPLICANT INFORMATION

Name of Applicant: Governor's Office of Storm Recovery (GOSR)

Name of Applicant Representative: Daniel Greene, General Counsel and Certifying Officer, GOSR

Address: 25 Beaver Street, New York, NY 10004

Telephone: (212)480-4644 Email: Daniel.Greene@stormrecovery.ny.gov

Project site owner (if different than above): NYC Department of Parks and Recreation

B. PROPOSED ACTIVITY

If more space is needed, include as an attachment.

I. Brief description of activity

The Proposed Actions comprise implementation of resiliency initiatives intended to work in tandem to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of Staten Island, NY. These initiatives include the Living Breakwaters Project (Breakwaters Project) and Tottenville Shoreline Protection Project (Shoreline Project). The Breakwaters Project would consist of ecologically enhanced breakwater segments occupying approximately 11.4 acres of sand/gravel habitat of Raritan Bay located between approximately 790 and 1,170 feet offshore in waters approximately 2 to 10 feet deep at mean low water. The Breakwaters Project would reduce wave energy at the shoreline; reduce/reverse shoreline erosion; increase habitat diversity through provision of complex subtidal, intertidal, and emergent rocky structure elements; and promote social resilience through educational and community programs proposed at a Water Hub. The Shoreline Project would provide on-shore resiliency measures that would augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. It includes a series of shoreline protection measures extending along the Tottenville shoreline largely within New York City Department of Parks and Recreation (NYC Parks) Conference House Park from approximately west of the intersection of Swinnerton Street and Billop Avenue to Page Avenue, including: an earthen berm, two eco-revetments, hybrid dune/revetment system, and raised edge (trail with a revetment), along with wetland enhancement and landscaping with coastal vegetation. ADA accessible access points and overlooks would be constructed along the shoreline protection system. Portions of the Breakwaters Project and Shoreline Project would be located within the 100-year floodplain and New York State Coastal Erosion Hazard Area.

2. Purpose of activity

The purpose of the Proposed Actions is to reduce wave energy and reduce/reverse coastal erosion along the shoreline in Tottenville while enhancing ecosystems and shoreline access and use. The specific goals and objectives of the Proposed Actions are: (1) Risk Reduction, via attenuation of wave energy, minimization of both event-based and long-term shoreline erosion, preservation of beach width, and addressing the impacts of coastal flooding; (2) Ecological Enhancement, by increasing the diversity of aquatic habitats consistent with Hudson-Raritan Estuary Plan priorities (e.g., fish and shellfish habitat); and (3) Social Resiliency, by fostering community education on coastal resiliency directly tied to and building off the structural components of this initiative, increasing physical and visual access to the water's edge, enhancing community stewardship of on-shore and in-water ecosystems, and increasing access to recreational opportunities

C. PROJECT LOCATION

Borough: Staten Island Tax Block/Lot(s): 7857-1, 150, 200 7722-1

Street Address: Tottenville shoreline of the south shore of Staten Island

Name of water body (if located on the waterfront): Raritan Bay

D. REQUIRED ACTIONS OR APPROVALS

Check all that apply.

City Actions/Approvals/Funding

City Planning Commission Yes No

<input type="checkbox"/> City Map Amendment	<input type="checkbox"/> Zoning Certification	<input type="checkbox"/> Concession
<input type="checkbox"/> Zoning Map Amendment	<input type="checkbox"/> Zoning Authorizations	<input type="checkbox"/> UDAAP
<input type="checkbox"/> Zoning Text Amendment	<input type="checkbox"/> Acquisition – Real Property	<input type="checkbox"/> Revocable Consent
<input type="checkbox"/> Site Selection – Public Facility	<input type="checkbox"/> Disposition – Real Property	<input type="checkbox"/> Franchise
<input type="checkbox"/> Housing Plan & Project	<input type="checkbox"/> Other, explain: _____	
<input type="checkbox"/> Special Permit		

(if appropriate, specify type: Modification Renewal other) Expiration Date: _____

Board of Standards and Appeals Yes No

<input type="checkbox"/> Variance (use)	
<input type="checkbox"/> Variance (bulk)	
<input type="checkbox"/> Special Permit	

(if appropriate, specify type: Modification Renewal other) Expiration Date: _____

Other City Approvals

<input type="checkbox"/> Legislation	<input type="checkbox"/> Funding for Construction, specify: _____
<input type="checkbox"/> Rulemaking	<input type="checkbox"/> Policy or Plan, specify: _____
<input type="checkbox"/> Construction of Public Facilities	<input type="checkbox"/> Funding of Program, specify: _____
<input type="checkbox"/> 384 (b) (4) Approval	<input type="checkbox"/> Permits, specify: _____
<input type="checkbox"/> Other, explain: _____	

State Actions/Approvals/Funding

State permit or license, specify Agency: NYSDEC Permit type and number: Articles 15, 25, and 34 of ECL

Funding for Construction, specify: _____

Funding of a Program, specify: _____

Other, explain: _____

Federal Actions/Approvals/Funding

Federal permit or license, specify Agency: USACE Permit type and number: Section 404 and Section 10

Funding for Construction, specify: US Department of Housing and Urban Development CDBG-DR

Funding of a Program, specify: _____

Other, explain: _____

Is this being reviewed in conjunction with a [Joint Application for Permits?](#) Yes No

E. LOCATION QUESTIONS

1. Does the project require a waterfront site? Yes No
2. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land under water or coastal waters? Yes No
3. Is the project located on publicly owned land or receiving public assistance? Yes No
4. Is the project located within a FEMA 1% annual chance floodplain? (6.2) Yes No
5. Is the project located within a FEMA 0.2% annual chance floodplain? (6.2) Yes No
6. Is the project located adjacent to or within a special area designation? See [Maps – Part III](#) of the NYC WRP. If so, check appropriate boxes below and evaluate policies noted in parentheses as part of WRP Policy Assessment (Section F).
 - Significant Maritime and Industrial Area (SMIA) (2.1)
 - Special Natural Waterfront Area (SNWA) (4.1)
 - Priority Martine Activity Zone (PMAZ) (3.5)
 - Recognized Ecological Complex (REC) (4.4)
 - West Shore Ecologically Sensitive Maritime and Industrial Area (ESMIA) (2.2, 4.2)

F. WRP POLICY ASSESSMENT

Review the project or action for consistency with the WRP policies. For each policy, check Promote, Hinder or Not Applicable (N/A). For more information about consistency review process and determination, see **Part I** of the [NYC Waterfront Revitalization Program](#). When assessing each policy, review the full policy language, including all sub-policies, contained within **Part II** of the WRP. The relevance of each applicable policy may vary depending upon the project type and where it is located (i.e. if it is located within one of the special area designations).

For those policies checked Promote or Hinder, provide a written statement on a separate page that assesses the effects of the proposed activity on the relevant policies or standards. If the project or action promotes a policy, explain how the action would be consistent with the goals of the policy. If it hinders a policy, consideration should be given toward any practical means of altering or modifying the project to eliminate the hindrance. Policies that would be advanced by the project should be balanced against those that would be hindered by the project. If reasonable modifications to eliminate the hindrance are not possible, consideration should be given as to whether the hindrance is of such a degree as to be substantial, and if so, those adverse effects should be mitigated to the extent practicable.

		Promote	Hinder	N/A
I	Support and facilitate commercial and residential redevelopment in areas well-suited to such development.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.1	Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.2	Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.3	Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.4	In areas adjacent to SMIA's, ensure new residential development maximizes compatibility with existing adjacent maritime and industrial uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.5	Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Promote	Hinder	N/A
2	Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.1	Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.2	Encourage a compatible relationship between working waterfront uses, upland development and natural resources within the Ecologically Sensitive Maritime and Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.3	Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas or Ecologically Sensitive Maritime Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.4	Provide infrastructure improvements necessary to support working waterfront uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.5	Incorporate consideration of climate change and sea level rise into the planning and design of waterfront industrial development and infrastructure, pursuant to WRP Policy 6.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.	Support and encourage in-water recreational activities in suitable locations.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Support and encourage recreational, educational and commercial boating in New York City's maritime centers.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.3	Minimize conflicts between recreational boating and commercial ship operations.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5	In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Protect and restore the quality and function of ecological systems within the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1	Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.2	Protect and restore the ecological quality and component habitats and resources within the Ecologically Sensitive Maritime and Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3	Protect designated Significant Coastal Fish and Wildlife Habitats.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.4	Identify, remediate and restore ecological functions within Recognized Ecological Complexes.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Protect and restore tidal and freshwater wetlands.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Maintain and protect living aquatic resources.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Promote	Hinder	N/A
5	Protect and improve water quality in the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1	Manage direct or indirect discharges to waterbodies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1	Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in <i>New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms</i>) into the planning and design of projects in the city's Coastal Zone.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4	Protect and preserve non-renewable sources of sand for beach nourishment.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.1	Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Prevent and remediate discharge of petroleum products.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7.3	Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Provide public access to, from, and along New York City's coastal waters.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1	Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Incorporate public access into new public and private development where compatible with proposed land use and coastal location.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	Provide visual access to the waterfront where physically practical.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Promote	Hinder	N/A
8.5	Preserve the public interest in and use of lands and waters held in public trust by the State and City.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.6	Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Protect scenic resources that contribute to the visual quality of the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.1	Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Protect and enhance scenic values associated with natural resources.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.1	Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Protect and preserve archaeological resources and artifacts.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

G. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Daniel Greene, New York State Governor's Office of Storm Recovery

Address: 25 Beaver Street, New York, NY 10004

Telephone: (212)480-4644 Email: Daniel.Greene@stormrecovery.ny.gov

Applicant/Agent's Signature: 

Date: 6/1/2018

Submission Requirements

For all actions requiring City Planning Commission approval, materials should be submitted to the Department of City Planning.

For local actions not requiring City Planning Commission review, the applicant or agent shall submit materials to the Lead Agency responsible for environmental review. A copy should also be sent to the Department of City Planning.

For State actions or funding, the Lead Agency responsible for environmental review should transmit its WRP consistency assessment to the Department of City Planning.

For Federal direct actions, funding, or permits applications, including Joint Applicants for Permits, the applicant or agent shall also submit a copy of this completed form along with his/her application to the [NYS Department of State Office of Planning and Development](#) and other relevant state and federal agencies. A copy of the application should be provided to the NYC Department of City Planning.

The Department of City Planning is also available for consultation and advisement regarding WRP consistency procedural matters.

New York City Department of City Planning

Waterfront and Open Space Division
120 Broadway, 31st Floor
New York, New York 10271
212-720-3525
wrp@planning.nyc.gov
www.nyc.gov/wrp

New York State Department of State

Office of Planning and Development
Suite 1010
One Commerce Place, 99 Washington Avenue
Albany, New York 12231-0001
(518) 474-6000
www.dos.ny.gov/opd/programs/consistency

Applicant Checklist

- Copy of original signed NYC Consistency Assessment Form
- Attachment with consistency assessment statements for all relevant policies
- For Joint Applications for Permits, one (1) copy of the complete application package
- Environmental Review documents
- Drawings (plans, sections, elevations), surveys, photographs, maps, or other information or materials which would support the certification of consistency and are not included in other documents submitted. All drawings should be clearly labeled and at a scale that is legible.

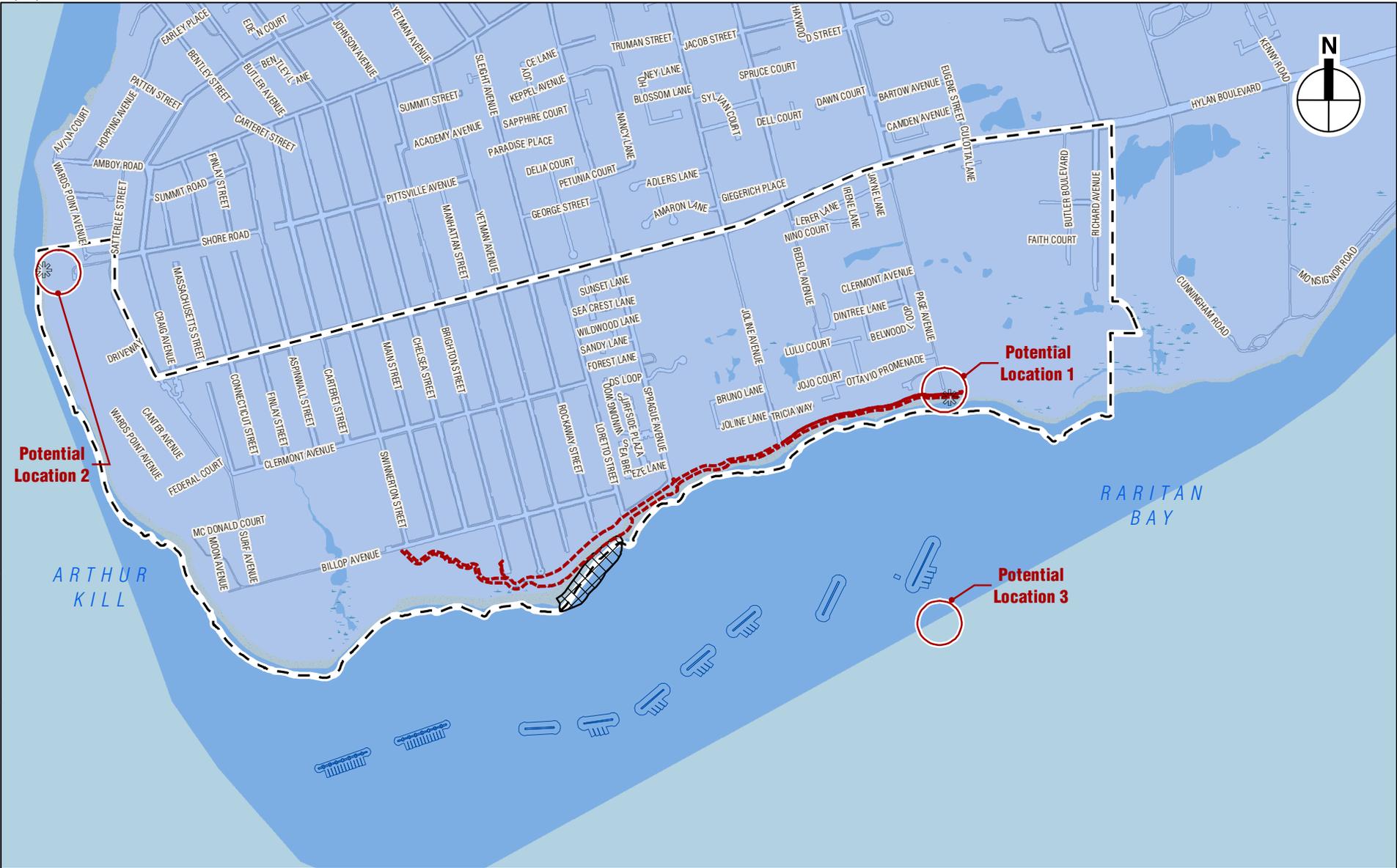
A. NEW YORK STATE COASTAL MANAGEMENT PROGRAM

The federal Coastal Zone Management Act (CZMA) of 1972 was enacted to support and protect the distinctive character of the waterfront and to set forth standard policies for reviewing proposed development projects along coastlines. The program responded to City, State, and federal concerns about the deterioration and inappropriate use of the waterfront. The CZMA emphasizes the primacy of State decision-making regarding the coastal zone. In accordance with the CZMA, New York State adopted its own Coastal Management Program (CMP), designed to balance economic development and preservation by promoting waterfront revitalization and water-dependent uses while protecting fish and wildlife, open space and scenic areas, farmland, and public access to the shoreline, and minimizing adverse changes to ecological systems and erosion and flood hazards. The New York State CMP provides for local implementation when a municipality adopts a local waterfront revitalization program, as is the case in New York City.

B. NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM

The proposed initiatives (Proposed Actions) are intended to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of Staten Island, NY. These initiatives include the Living Breakwaters Project (Breakwaters Project) and Tottenville Shoreline Protection Project (Shoreline Project), together the “Layered Strategy.” The Proposed Actions are located in the designated Coastal Zone (see **Figure 1**), and are therefore subject to the coastal zone management policies of both the City and the State. The New York City Waterfront Revitalization Program (WRP) is the City’s primary coastal zone management tool and was developed in accordance with the Federal Coastal Zone Management Act of 1972 and New York State Executive Law Article 42: Waterfront Revitalization of Coastal Areas and Inland Waterway Act. The City’s WRP is made up of 10 major policies focusing on the goals of improving public access to the waterfront; reducing damage from flooding and other water-related disasters; protecting water quality, sensitive habitats like wetlands and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses.

In 2011, revisions to the City’s WRP were made to reflect policy elements included in the New York City Department of City Planning’s (NYCDCP) 2011 “Vision 2020 New York City Comprehensive Waterfront Plan,” including incorporation of climate change and sea level rise considerations to increase the resiliency of the waterfront area, promotion of waterfront industrial development and both commercial and recreational water-borne activities, increased restoration of ecologically significant areas, and design of best practices for waterfront open spaces. These revisions to the WRP were approved by the City Council on October 30, 2013, and approved by the NYS Secretary of State on February 3, 2016.



-  Proposed Breakwater Features
-  Proposed Shoreline Project Elements
-  Proposed Floating Dock (associated with Water Hub Potential Locations 1 and 2 only)
-  Study Area
-  Potential Water Access
-  Proposed Shoreline Restoration Area
-  Potential Location of Proposed Water Hub (exact location to be determined)
-  Coastal Zone Boundary

CONSISTENCY OF PROPOSED ACTIONS WITH THE WATERFRONT REVITALIZATION PROGRAM POLICIES

The Proposed Actions comprise implementation of resiliency initiatives intended to work in tandem to enhance coastal and social resiliency and environmental resources along the Tottenville shoreline of the South Shore of Staten Island. For the purposes of this assessment, the Proposed Actions represent the implementation of the Layered Strategy, which includes both the Breakwaters Project and the Shoreline Project. The Layered Strategy was designed with the specific goals and objectives of: (1) risk reduction through attenuation of wave energy, minimization of event-based and long-term shoreline erosion, preservation of beach width, and addressing impacts of coastal flooding; (2) ecological enhancement by increasing the diversity of aquatic habitats for fish and shellfish, consistent with the Hudson-Raritan Estuary Plan; and (3) social resiliency for the Tottenville shoreline of the South Shore of Staten Island by fostering community education on coastal resiliency, increasing physical and visual access to the water's edge, enhancement of community stewardship of on-shore and in-water ecosystems, and increasing access to recreational opportunities.

The Breakwaters Project would include the ecologically enhanced breakwater system, the area of one-time shoreline restoration, the proposed Water Hub (only one of three potential locations will be selected), the proposed seasonally placed floating dock (only for Water Hub Potential Locations 1 and 2), and possible accessory seasonal boat launch (only for Water Hub Potential Locations 1 and 2). The proposed area of one-time shoreline restoration would extend along approximately 806 linear feet of shoreline between Manhattan Street and Loretto Street, where the beach is particularly narrow and vulnerable to erosion, and where there are adjacent vulnerable assets (tidal wetlands and homes) in the FEMA V and Limit of Moderate Wave Action zones in the 100-year floodplain. The breakwater system would consist of 9 breakwater segments occupying approximately 11.4 acres of sand/gravel bottom habitat in Raritan Bay located between 790 and 1,170 feet offshore in waters approximately 2 to 10 feet deep at mean low water. The majority of the breakwater structures would be located more than 1,700 feet from the Federal Navigation Channel, with the closest breakwater segment located more than 700 feet from the channel. The breakwater segments would comprise bedding stone (scour apron), core stone, rip-rap stone, and armor units made of stone or bio-enhancing concrete, with "reef streets" and "reef ridges" extending out along the bottom of the Bay.

Installation of the breakwaters would result in the conversion of approximately 11.4 acres of subtidal sand/gravel habitat and the open water habitat overlying this substrate to complex rocky habitat composed of rock and bio-enhancing concrete of varying sizes. By design, the breakwater system would incorporate ecological enhancements expected to benefit the target species groups identified for the project. The high-relief rocky habitat provided by the breakwaters would be designed to attract and retain habitat-creating benthic invertebrates and shellfish, including bivalves. Ecological design features of the breakwaters (i.e., varying levels of elevation, inclination, bio-enhancing materials, textures, interstitial spaces, water retaining elements, reef streets and rock size variations) would facilitate the recruitment of a rich benthic community of habitat-forming encrusting invertebrates and algae, while also providing suitable sheltering and foraging habitat for fish and benthic invertebrates. The Breakwaters Project would reduce wave energy at the shoreline; reduce/reverse shoreline erosion; increase habitat diversity through provision of complex subtidal, intertidal, and emergent rocky structure elements; and promote social resilience through the educational and community programs at the Water Hub.

One of three potential locations¹ under consideration would be selected for siting the Water Hub within Conference House Park. Potential Location 1 would be in the vicinity of the southern terminus of Page Avenue and would include the construction of a new structure. Potential Location 2 would be in the northwestern portion of Conference House Park and would include the rehabilitation and adaptive reuse of an existing NYC Parks building. Potential Location 3 is a water-based Water Hub Option. It would comprise a “floating” Water Hub consisting of a vessel operated by a non-profit organization (e.g., BOP). The vessel would visit the breakwater project area periodically for education and monitoring and would be docked at existing facilities in the City (serving local groups and community members when docked locally).

Potential Location 1 (On-Shore): Potential Location 1 is in the vicinity of the southern terminus of Page Avenue. At this location, there are two options for the construction of the Water Hub. The first, Page East Option, would locate the proposed Water Hub in an existing Conference House Park parking lot and surrounding wooded area immediately east of Page Avenue. The second, Page West Option, would use a grassy site west of Page Avenue that has previously contained a two-story NYC Parks building (which was demolished in 2016 due to substantial damage caused by Superstorm Sandy). The proposed Water Hub facility is expected to include an enclosed 5,000-square-foot building and approximately 35,500 square feet of site improvements that would include landscaping, parking and utility spaces and designated space for the use of NYC Parks vehicles and equipment. An approximately 210-foot-long by 8-foot wide accessory seasonal boat launch would extend from about 1 foot above MHW to water depths sufficient for docking of a shallow draft research vessel in water depths between 4 and 5 feet at MLW. The proposed Water Hub would provide direct on-site waterfront access and would include parking for visitors, as well as several on-shore and near-shore landscape elements. It is anticipated that the facility would be used by the New York Harbor Foundation, NYC Parks, and local schools and community groups. Should Water Hub programming be located at Potential Location 2 or Potential Location 3, a small facility would be located at Potential Location 1 to provide seating, wayfinding and interpretive elements, and potential storage for kayaks and beach cleaning equipment. This structure would be a small pavilion, shed, or other light structure (approximately 400 sf), and may be connected to the public water supply but without sanitary facilities. The existing parking facilities at the terminus of Page Avenue would be used to access this facility.

Potential Location 2 (On-Shore): Potential Location 2 is in the north-western portion of Conference House Park. At this location, there are two options for the adaptive reuse of one of two existing NYC Parks buildings for Water Hub programming: Henry Hogg Biddle House (Biddle House) and the Rutan-Beckett House. Water access would be provided in the vicinity of the NYC Parks building selected for adaptive reuse. Water access would be provided by ADA accessible pathways and ramps leading to the beach in the vicinity of a seasonally deployed temporary floating boat launch. Parking for Water Hub activities at Potential Location 2 would be accommodated at the existing Conference House Park Visitor’s Center. A small facility to provide seating, wayfinding, interpretative elements, potential storage for kayaks and beach cleaning equipment would be constructed near the terminus of Page Avenue. This structure would be a small pavilion, shed, or other light

¹ Since the publication of the DEIS, Potential Location 1 has been removed from further consideration. However, in the interest of completeness and to ensure a detailed comparative assessment of potential alternatives, this assessment conservatively retains the analyses associated with Potential Location 1 that were presented in the DEIS.

Coastal and Social Resiliency Initiatives for Tottenville Shoreline FEIS

structure as described above under Potential Location 1. The existing parking facilities at the terminus of Page Avenue would be used to access this facility. Additional wayfinding, interpretive signage, and monitoring locations would be integrated along the length of the shoreline as part of the Water Hub's educational programming.

Potential Location 3: Potential Location 3 would be a floating Water Hub comprising a vessel operated by a non-profit organization (e.g., BOP). The vessel is anticipated to be between 54 and 100 feet long by 24 feet wide, with a draft of 4 feet. It would be docked at existing facilities in the City (serving local groups and community members when docked locally) and would visit the project area approximately once per week from April through November for student based teaching events, and host community events approximately twice per month. When in the project area, the vessel would anchor near the breakwater structures for observation/monitoring and education activities. Each trip would accommodate approximately 30 to 75 students/community members and instructors/presenters depending on the size of the vessel ultimately acquired. The vessel would be anchored off the breakwater for less than one day each time and would only operate where the bottom of the vessel can maintain a 2-foot separation from the mudline. Should Water Hub programming be located at potential Location 3, wayfinding, interpretive elements and potential storage for kayaks would be constructed near the terminus of Page Avenue. Additional wayfinding and interpretative signage and monitoring elements would be integrated along the length of the shoreline as part of the Water Hub's educational programming, and a small kayak storage facility provided near the terminus of Page Avenue. No additional parking facilities would be required with this option. Also, because this option does not include an on-shore facility, a seasonally deployed temporary floating boat launch would not be included as part of the project. The Shoreline Project would provide on-shore stabilization measures that would augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. It would include a series of shoreline protection measures extending along the Tottenville shoreline almost entirely within NYC Parks' Conference House Park² from approximately west of the intersection of Swinnerton Street and Billop Avenue to Page Avenue, including, from west to east: an earthen berm, hybrid dune/revetment system, two sections of eco-revetments, and raised edge with a revetment, along with wetland enhancements and landscaping with coastal vegetation. The hybrid dune/revetment would replace the section of man-made temporary dune comprising sand-filled barrier bags that was installed following Superstorm Sandy between Brighton Street and Loretto Street. Green infrastructure would be implemented wherever possible throughout the project. Three access points and overlooks compliant with the Americans with Disabilities Act (ADA) would be constructed along the shoreline protection system. Portions of the Breakwaters Project and Shoreline Project would be located within the 100-year floodplain and New York State Coastal Erosion Hazard Area (CEHA).

An assessment of the Proposed Actions' consistency with the revised New York City WRP is provided below for all questions answered "Promote" or "Hinder" on the revised 2016 Consistency Assessment Form included with this assessment. The New York State Department of State Coastal Management Program Federal Consistency Assessment Form

² With the exception of a small portion of the Shoreline Project proposed within an unbuilt portion of the NYCDOT Surf Avenue right-of-way, all on-shore project components would be constructed within the boundaries of Conference House Park.

and New York State Department of State Coastal Management Program Coastal Assessment Form included with this assessment assess the consistency of the Proposed Actions with the New York State Coastal Management Program policies.

Policy 3: Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.

3.1: Support and encourage in-water recreational activities in suitable locations.

The proposed community Water Hub site at Potential Locations 1, 2, and 3 would provide waterfront and water access for human-powered boating. Storage for kayaks would potentially be available onsite. There are currently two on-shore sites proposed for the Water Hub facility (Potential Locations 1 and 2), as described above. A seasonally deployed floating boat launch, proposed as part of Potential Locations 1 and 2, would allow access for a shallow draft research vessel operated by organizations like the New York Harbor Foundation's Billion Oyster Project (BOP) and the New York Harbor School (NYHS). The boat launch would be stored on-shore during the winter months. The seasonal floating dock would also provide water-based access to the breakwaters system for Potential Locations 1 and 2.

For both commercial and recreational shallow draft vessels, leaving the channel is an option and to help boaters navigating in that area the National Oceanic and Atmospheric Administration (NOAA) issues navigation charts that are regularly updated to reflect local conditions. In the project area their Chart number 12332 (Raritan River Bay to New Brunswick) provides water depth insights. It is anticipated that the US Coast Guard will require navigation aids to provide visibility to mariners as is typically done for these structure types. The type and location of the navigation aids will be provided in accordance with federal regulations for the structure's classification. Additionally, the segments would be spaced far enough apart to avoid interference with recreational boating in Raritan Bay.

Therefore, the Proposed Actions would promote this policy.

3.3: Minimize conflicts between recreational boating and commercial ship operations.

The project site is located within Raritan Bay in proximity to the Raritan Bay Federal Navigation Channel, Ward Point Bend (East) and local navigation outside that federal channel. Raritan Bay is a shallow water embayment particularly in the proposed Living Breakwaters area. Although the Federal Navigation Channel is maintained at minus 35 feet of depth at mean lower low water (MLLW) the adjacent shallows are typically waters with depths of less than ten feet at MLLW. This shallow water restricts deeper draft vessels from leaving the Federal Channel because of the potential for grounding. Additionally, simulations have shown that there would 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. Therefore, the Proposed Actions would have limited potential to result in conflicts between recreational boating and commercial ship operations. Additionally, in 2015, the US Army Corps of Engineers (USACE) modified Section 408 of their regulations dealing with the Rivers and Harbors Act of 1899 and Federal Navigation Projects. The revision requires that work being performed within a setback distance of three times the authorized depth of a Federal Channel coordinate with them. In the case-at-hand that setback distance is 105 feet. All the Living Breakwater structures are well outside that zone. Therefore, any recreational vessels

located in proximity to the breakwaters segments would not be in close proximity to commercial vessels in the Federal channel and would not conflict with users of the Federal channel.

Therefore, the Proposed Actions would promote this policy.

3.4: *Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.*

Promoting use by small research vessels and the vessel associated with the floating Water Hub (i.e., Potential Location 3) would be consistent with existing use of Raritan Bay and would not result in adverse impacts to the aquatic environment. Ongoing use of the Raritan Bay for recreational boating would continue and would not result in adverse impacts to Raritan Bay. The small research vessels (if Potential Locations 1 or 2 are selected) or the vessel operated as part of the floating Water Hub (if Potential Location 3 is selected) would maintain sufficient clearance between the bottom of the vessel and the Bay bottom in order to minimize impacts to aquatic resources. The location of the breakwater segments would be marked in accordance with USCG requirements, and the segments would be spaced far enough apart to avoid interference with recreational boating in Raritan Bay. The majority of the breakwater segments would be more than 1,700 feet from the Federal Navigation channel, with the closest breakwater segment located more than 700 feet from the channel. At these distances, the breakwaters would not interfere with existing water uses of the Navigation Channel.

In-water structures that provide fishing opportunities for recreational fisherman currently exist in Raritan Bay in the vicinity of the Proposed Actions. Recreational use of the breakwaters by anglers would likely be comparable to current use of these existing structures (2 to 5 boats per day observed at artificial reefs in New York waters). Based on NMFS Marine Recreational Information Program (MRIP) survey data, a total of 630 recreational fishing trips were made in Raritan Bay between 2012 and 2016 (average of 126 trips per year). Conservatively assuming that all 126 recreational fishing trips per year would target the breakwaters, this would be equivalent to 4 to 6 trips per week over a 6-month period, which likely represents the prime fishing season in Raritan Bay. If these trips occur primarily over the weekend (Friday through Sunday), the breakwaters would see an average of up to 2 boats per day, which is within the range of daily average boat counts at other nearshore reefs and existing in-water structures in the area and would not be expected to result in adverse impacts to the aquatic environment. Kayakers and canoers may reach the breakwaters from access points along the shoreline outside the project area, but recreational access for these types of vessels is limited along the south shore of Staten Island where the breakwaters would be located, and significant increases in recreational boating are not anticipated. NMFS MRIP data indicates that recreational charter boats were rare in Raritan Bay between 2012 and 2016, and the breakwaters would not be expected to affect the amount of charter fishing in the area.

Therefore, the Proposed Actions would promote this policy.

Policy 4: Protect and restore the quality and function of ecological systems within the New York City coastal area.

4.4: *Identify, remediate, and restore ecological functions within Recognized Ecological Complexes.*

Two Recognized Ecological Complexes (RECs) exist within or adjacent to the study area: Conference House Park and Hybrid Oak Woods Park. One additional REC, Butler Manor Woods, is located north of Potential Location 1 for the Water Hub. The south shore of Staten Island, which includes the three RECs, is vulnerable to projected sea level rise, with predictions of increased flooding and erosion during storm events. The Shoreline Project would be located largely within Conference House Park and would alter the current condition of the park in order to improve resiliency against coastal erosion along the shoreline in Tottenville, while enhancing ecosystems and shoreline access and use. Green infrastructure would be implemented where possible and native coastal vegetation would be incorporated throughout the Shoreline Project. The ecologically enhanced breakwater system of the Breakwaters Project is designed to reduce wave energy at the shoreline, and prevent or reverse shoreline erosion, thereby protecting the Conference House Park and Hybrid Oak Woods Park RECs. Together, as the Layered Strategy, these measures would improve the ecological function and resilience of the existing ecological communities within these RECs, including maritime and wetland communities in the study area.

Therefore, the Proposed Actions would promote this policy.

4.5: *Protect and restore tidal and freshwater wetlands.*

The three main goals of the Proposed Actions are in concert with the goal of protecting and restoring tidal and freshwater wetlands. The Layered Strategy would reduce coastal erosion, enhance ecosystems along the coast, and foster stewardship of these systems with an educational component. Each action would help to protect the tidal wetlands present within the study area. As discussed in Chapter 9, “Natural Resources,” of the EIS, construction of the breakwaters would result in temporary and permanent impacts to New York State Department of Environmental Conservation (NYSDEC) littoral zone tidal wetlands and mapped National Wetlands Inventory (NWI) estuarine wetlands in the vicinity of the breakwater segments due to sediment resuspension during construction (placement of sand for shoreline restoration, placement of breakwater materials, and movement of construction barges and vessels). Increases in suspended sediment would be temporary, localized, and would dissipate upon cessation of sediment disturbing activities.

There would be a net loss of 7.1 acres of NYSDEC littoral zone tidal wetlands within the footprint of the Type A and Type B breakwater segments, and 2.6 acres within the portion of the shoreline restoration below mean high water (MHW), for a total loss of NYSDEC littoral zone tidal wetlands of 9.7 acres. The breakwater alignment, segment length, and distance from shore were designed to promote beach accretion, but avoid the creation of tombolos, or sand spits connecting the shore and breakwater created through deposition, and encroaching on littoral zone wetlands. The loss of NYSDEC littoral zone wetlands within the footprint of the breakwater segments would be small in comparison to the amount of unaffected NYSDEC littoral zone tidal wetlands within Raritan Bay and would not result in significant adverse impacts to the NYSDEC littoral zone wetland resources.

The eco-revetment between Brighton Street and Manhattan Street would be constructed within the northern limit of the 0.8-acre delineated tidal wetland. An approximately 630-square-foot section of the hybrid dune/revetment would also be constructed in this wetland at its eastern limit. In total, approximately 6,270 square feet (0.14 acres) of this

wetland would be impacted. An existing sand bridge comprising unpermitted fill (approximately 595 square feet and 44 CY) that runs north to south currently divides the delineated wetland and would be removed in order to construct the eco-revetment. The removal of this sand bridge would remove an impediment to tidal exchange within the eastern portion of the wetland, and result in a net change in fill within the wetland of approximately 5,675 square feet (0.13 acres), and 1,176 CY. Permanent impacts to the tidal wetland would be primarily within the portion of the wetland dominated by common reed and, while the loss of a portion of the wetland would be an adverse effect, it would be offset by the enhancement of the tidal wetland plant community that would include improved tidal exchange through modification of the inlet to Raritan Bay. Phragmites would be removed from the wetland, and native saltmarsh plants would be re-established through seeding or planting plugs to supplement the native saltmarsh vegetation that already occurs in the wetland. The existing native saltmarsh vegetation would be retained to the extent possible, and individual plants and seeds would be collected for preservation and replanting within the wetland as part of the enhancement. Currently, there is limited connectivity between this wetland and the open waters of Raritan Bay due to sand clogging the outlet structure to the wetland and the presence of the temporary dunes. The Proposed Actions would increase tidal exchange between the wetland and Raritan Bay, allowing access for fish that may move through the Bay and connected waters, and remove the sand bridge, which impedes tidal exchange with the eastern portion of this wetland. These enhancements may also improve foraging habitat for waterbirds that occur in the wetlands.

Temporary impacts would be minimized through the use of marsh mats or low ground-pressure equipment within the wetland and installation of erosion and sediment control measures throughout the construction area in accordance with a Stormwater Pollution Prevention Plan (SWPPP) prepared as required under the State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity (General Permit). Portions of the wetland disturbed during hybrid dune/revetment and eco-revetment construction would be restored as necessary (e.g., repair of ruts, stabilization of soil). Wetland vegetation would be planted to replace vegetation temporarily disturbed during construction. With these measures in place, temporary impacts to wetlands during construction and the permanent loss of a small portion of the wetland due to the eco-revetment and hybrid dune/revetment would not result in significant adverse impacts to wetland resources.

Other elements of the shoreline components of the Proposed Actions would be built within the NYSDEC-regulated tidal wetlands adjacent area (TWAA) (i.e., the hybrid dune/revetment, the eco-revetment along Surf Avenue that would extend to approximately Sprague Avenue, raised edge, parking lot for the Water Hub at Potential Location 1, and the small facility near the terminus of Page Avenue that would be developed at Water Hub Potential Location 1 should the Water Hub program be sited at Potential Locations 2 or 3, and wayfinding, interpretive and monitoring elements along the Shoreline Project should the Water Hub be sited at Potential Locations 2 or 3). Within the TWAA outside the shoreline restoration area, erosion and sediment control measures (e.g., silt fencing and hay bales) would be implemented in accordance with a SWPPP prepared for the project as required by the General Permit and would minimize discharges of sediment during construction and avoid adverse effects to wetlands. The hybrid dune/revetment would enhance the function of the TWAA in protecting

NYSDEC littoral zone tidal wetlands within Raritan Bay by stabilizing the shoreline. In addition to stabilizing the shoreline using a gradual riprap slope designed to minimize erosion of the beach at the toe of the structure, the raised edge would include stormwater management measures, such as bioswales, to maintain the protective function of the TWAA. While the walkways would be impermeable, stormwater management measures like bioswales would be installed adjacent to the eco-revetments and raised edge to allow treatment of runoff from these project elements, and the planted portions of the revetment would also allow some infiltration. The landscaping with native coastal species of the hybrid dune/revetment, eco-revetments, and raised edge would also enhance the native coastal habitats available within the TWAA.

The parking area for the Water Hub at Potential Location 1 would be designed as a pervious surface and would be designed to manage any net runoff generated by the parking area. The seasonal deployment of the floating boat launch (for Potential Locations 1 and 2) would occupy a small portion of the TWAA and would not adversely affect this resource. The Proposed Actions would minimize the introduction of impervious surfaces within the NYSDEC TWAA, would stabilize the shoreline while minimizing the potential for erosion of the beach, would enhance the habitats through the establishment of native dune vegetation and other native coastal plant species throughout the Shoreline Project, and would not adversely affect the function of the TWAA to protect NYSDEC littoral zone tidal wetlands.

Therefore, the Proposed Actions would promote this policy.

- 4.6:** *In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.*

The Breakwaters Project would integrate the goal of increasing habitat diversity and restoring ecological functions to a portion of Raritan Bay through the establishment of ecologically enhanced breakwater system designed to reduce wave energy at the shoreline, and prevent or reverse shoreline erosion while creating hard/structured marine habitat. As described in Chapter 9, “Natural Resources,” of the EIS, approximately 11.4 acres of open water and low relief sand/gravel habitat and overlying open water habitat within the footprint of the breakwaters would be converted into diverse high-relief habitat in the subtidal and intertidal zones, including the creation of interstitial habitat, crevices, and other usable surface area that would be available for use by aquatic biota. The structural complexity resulting from the breakwater segments would provide increased habitat diversity when compared to the sand and gravel area and open water habitat converted to the breakwaters. The newly created habitat would be designed to attract habitat-forming and habitat-augmenting macroinvertebrates and algae, which would further facilitate development of a rich aquatic community. The incorporation of bio-enhancing concrete units would increase the potential for establishment of a benthic community anchored by a healthy population of habitat forming species that includes mussels, hard clams, macro algae, barnacles, tunicates, tubeworms, and sponges. Porous rock structures like the breakwaters have also been shown to provide effective habitat for juvenile fish.

The connectivity and design of the Shoreline Project components, including smooth transitions between each section and planting of native coastal vegetation throughout,

would provide diverse habitat for a number of shoreline terrestrial and avian species. Landscaping would create gradual transitions where appropriate to enhance habitat value; for example, planting of American beach grass on the hybrid dune/revetment system would soften the transition between the existing beach and inland scrub/shrub and maritime forest to increase availability of habitat for coastal wildlife. As described under Policy 4.4, the Shoreline Project would improve the ecological function and resilience of the existing ecological communities, including maritime and wetland communities in the study area, while increasing the resiliency of the Tottenville shoreline and providing risk reduction from the effects of wave action, coastal flooding, and shoreline erosion.

Therefore, the Proposed Actions would promote this policy.

- 4.7:** *Protect vulnerable plant, fish, and, wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.*

Federally-listed aquatic species that are considered by National Marine Fisheries Service (NMFS) to have the potential to occur in Raritan Bay, near the project site, include Atlantic sturgeon (*Acipenser oxyrinchus*; endangered), loggerhead sea turtle (*Caretta caretta*; threatened), green sea turtle (*Chelonia mydas*; threatened), and Kemp's ridley sea turtle (*Lepidochelys kempi*; endangered). The Breakwaters Project would be designed to minimize any potential change in aquatic resources that would adversely affect use of Raritan Bay by these species. While Atlantic sturgeon are not expected to occur in significant numbers within the study area, transient adults and sub-adults may be present as they move through shallower marine waters along the Atlantic coast. These life stages are benthic feeders, and the conversion of 11.4 acres of sandy/gravel bottom to complex hard structure could temporarily disturb foraging habitat. However, the footprint of the breakwater structures will represent only about 2 percent of the 610 acres of available inshore habitat in the study area within Raritan Bay, and Atlantic sturgeon would be able to avoid the construction area in favor of suitable habitat nearby. Subadult and adult Atlantic sturgeon consume a greater proportion of fish in their diets compared to younger life stages and structure-oriented forage fish are expected to colonize the breakwaters. Once the breakwaters are established, Atlantic sturgeon will be able to forage for benthic fish and invertebrates in and around the structures. Sea turtles are considered to have the potential to occur within the study area on rare occasions, and only as transients rather than for long-term occupation for breeding, wintering, or growth and development; therefore, neither construction nor operation of the Breakwaters Project would be expected to result in significant adverse effects to sea turtles. Informal consultation with NMFS under Section 7 of the ESA was initiated on April 19, 2017. This consultation process was completed on May 19, 2017, with a concurrence from NMFS with GOSR's conclusion that the Proposed Actions are not likely to adversely affect the ESA-listed species and/or designated critical habitat under NMFS jurisdiction (see **Appendix E-2** of the EIS).

In response to a request for information on state-listed species and significant natural communities, NYNHP provided the following non-historical records from within 0.5 miles of the project site: sweetbay magnolia (*Magnolia virginiana*; endangered), northern gama grass (*Tripsacum dactyloides*; endangered), willow oak (*Quercus phellos*; endangered), wild potato vine (*Ipomoea pandurate*; endangered), yellow giant-

hyssop (*Agastache nepetoides*; threatened), white-bracted boneset (*Eupatorium leucolepis* var. *leucolepis*; endangered), persimmon (*Diospyros virginiana*; threatened), and dune sandspur (*Cenchrus tribuloides*; threatened). Dune sandspur, northern gamma grass, and yellow giant-hyssop were observed within the study area. Measures to minimize impacts (e.g., seed collection and propagation, replanting within the study area, transplanting of plants, etc.) would be developed in association with NYC Parks and NYSDEC. The other state-listed plant species are not expected to occur within the study area on the basis of their habitat requirements and the existing habitats.

Federally endangered, threatened, candidate, or proposed species listed by the U.S. Fish and Wildlife Service (USFWS) IPaC System as occurring in Richmond County near the project site include the piping plover (*Charadrius melodus*; threatened) and roseate tern (*Sterna dougalli*; endangered). Consultation with USFWS was initiated on April 17, 2017, and was completed on January 17, 2018 with a concurrence from USFWS with GOSR's conclusion that the Proposed Actions are not likely to adversely affect ESA-listed species under USFWS jurisdiction. Through this consultation, USFWS indicated that red knots (*Calidris canutus rufa*) have been documented on other beaches and coastal areas on Staten Island and Jamaica Bay, New York, and would therefore have the potential to occur within the study area as occasional transient individuals. Habitat for these species is not present within the study area and individuals of these species were not observed during reconnaissance surveys. Although the breakwater alignment, segment length and distance from shore are designed to promote beach accretion, but avoid the creation of tombolos, the beach would likely remain too narrow to support nesting piping plovers or other beach-nesting waterbirds. Beaches less than 80 meters wide (262 feet), for example, are considered narrow for piping plovers. Piping plovers in New Jersey were not found to nest less than 10 meters (32 feet) away from the high tide. The hybrid dune/revetment would be too high and too steeply sloped for piping plovers to nest on, and the margin between the base of the hybrid dune/revetment and the high tide line may not be sufficient for nesting. It is therefore unlikely that piping plovers as well as other beach-nesting birds would nest on the beach. However, in the event that any such species are found to nest on the beach, NYC Parks would enact appropriate management and protection protocols for each species in consultation with USFWS and any other relevant regulatory agencies. It is expected that red knots and other shorebirds may occur on the beach during spring and fall migration with the same likelihood as at present. The shoreline restoration and breakwaters may improve benthic invertebrate communities as well as horseshoe crab nesting habitat, and in turn, improve refueling conditions for migrating shorebirds.

The only listed wildlife species that were observed within the study area during the May 18 and June 9, 2015, wildlife reconnaissance were the osprey (*Pandion haliaetus*; special concern) and common tern (*Sterna hirundo*; threatened), both of which were seen passing overhead or offshore from the project site. None of the birds documented by the 2000–2005 Breeding Bird Atlas in the census block in which the project site is located are federally- or state-listed.

Four species of reptiles and amphibians that were documented by the Herp Atlas Project and are considered to have the potential to occur within the study area on the basis of their habitat associations are state-listed: eastern mud turtle (*Kinosternon subrubrum*; endangered), eastern box turtle (*Terrapene carolina carolina*; species of special concern), eastern fence lizard (*Sceloporus undulatus*; threatened), and southern leopard

frog (*Lithobates sphenoccephalus*; species of special concern). Should any of these species be encountered during construction of the Proposed Actions, they would be relocated to appropriate habitat in the vicinity beyond the limits of construction to avoid any direct impacts. Suitable habitat for the eastern mud turtle and southern leopard frog exists in the wetlands associated with the Twin Streams of the Lanape and Wards Point Pond, which are at least 250 feet from the Shoreline Project's limits of disturbance, and would not be impacted by construction of the Proposed Actions. The Proposed Actions would not result in adverse impacts to migration or overwintering for these species, nor would they impede the hydrological and physical connection of these areas to Raritan Bay. Eastern box turtle and eastern fence lizard have the potential to occur in the vicinity of the proposed earthen berm between Carteret Street and Brighton Street. During construction, the project site would be blocked with silt fencing that would prevent these species from entering the construction area. The earthen berm, which would range in height from 1 to 7.5 feet and have sloped and vegetated sides, would not affect the movements of either species, as they would be capable of crossing the berm. The berm would be planted with native vegetation and would reduce the current fragmentation caused by the existing trail. The Shoreline Project would not result in a change in habitat availability and would not create a barrier to the movement of these species, and both would be expected to occur in the area with the same likelihood and in the same abundance.

Therefore, the Proposed Actions would promote this policy.

4.8: *Maintain and protect living aquatic resources.*

During construction of the Proposed Actions, temporary sediment resuspension and localized increases in turbidity would occur during the placement of the breakwater materials, movement of construction barges and vessels, and one-time shoreline restoration. Suspended sediments would settle quickly following cessation of sediment disturbing activities and would not result in adverse impacts to aquatic resources.

For the Water Hub and Shoreline Project, construction activities would be conducted in accordance with the SWPPP developed as required by the General Permit, minimizing the potential for stormwater runoff to adversely affect Raritan Bay aquatic resources during construction and operation of these components.

The Breakwaters Project has been designed to maintain sufficient flushing conditions in the study area to minimize potential impacts to water quality of Raritan Bay. According to DELFT 3D water circulation modeling completed for the Breakwaters Project, the breakwaters would have little to no impact on flushing times in the project area, and therefore would have no significant impact on water quality. The individual breakwater segments have wide gaps (typically approximately 200 feet) between them, allowing for water movement and flushing between the ocean side and landward side of the structures. Thus, modeling confirmed that the Breakwaters Project would have negligible, if any, impact on large-scale water circulation and flushing, and thus water quality, in the study area. The breakwaters would create small changes in flow directly surrounding the structures, but would not significantly disrupt existing currents in Raritan Bay, or result in increased erosion of bay bottom at the toe of the breakwater segments.

Flow 3D modeling of localized currents and sediment movement around individual breakwater structures completed for the project indicates the potential for scour/deposition patterns to develop at the breakwater perimeter under ebb and flood tidal flows. The scour and deposition depths are modest, estimated as 0.05 to 0.15 feet of scour and 0.1 to 0.3 feet of deposition under normal tidal and wave conditions. There is indication of reversal of the trends between flood and ebb conditions for most areas. For fixed structures in tidal currents, scour and scour-related deposition typically reach quasi-equilibrium states, including potentially some change in grain size to scour resistant diameters. The modeling results indicate that scour would be localized, within 15 feet of the ends of the breakwater.

The breakwaters (excluding the shoreline restoration) would convert approximately 11.4 acres of existing sand/gravel bottom habitat and the approximately 115,990 cubic yards (CY) of open water habitat below MHW overlying this portion of Raritan Bay to complex hard structure (a habitat that was historically present but currently scarce in Raritan Bay). This area of bottom habitat represents about 2 percent of existing sand/gravel bottom habitat within the approximately 610-acre portion of Raritan Bay within the study area. While the breakwaters would convert a portion of open water to structured habitat, this loss would be small compared to the extensive open water habitat available within the study area and Raritan Bay as a whole. Additionally, the structures would not hinder the movement of fish and other aquatic biota through the water column, nor would they disrupt water circulation in Raritan Bay. Fish and other aquatic biota, including anadromous species and early life stages, would be able to pass (either actively or passively) around the individual breakwater segments at any given time. The conversion of sand and gravel habitat and open water habitat to structure would not occur all at once, but rather sequentially over an 11-month period (6 months in the first year and 5 months in the second year) as the breakwater segments are constructed. This habitat conversion would result in high-relief, complex, rocky reef-like habitat within the breakwater segments. By design, the breakwater system would incorporate ecological enhancements expected to benefit the target species groups identified for the project. The structural complexity resulting from the breakwater segments would provide increased habitat diversity when compared to the sand and gravel area and open water habitat replaced by the breakwaters.

The high-relief rocky habitat provided by the breakwaters would be designed to attract and retain habitat-creating benthic invertebrates and shellfish, including bivalves. Ecological design features of the breakwaters (i.e., varying levels of elevation, inclination, bio-enhancing materials, textures, interstitial spaces, water retaining elements, reef streets and rock size variations) would facilitate the recruitment of a rich benthic community of habitat-forming encrusting invertebrates and algae, while also providing suitable sheltering and foraging habitat for fish and benthic invertebrates, including threatened and/or endangered species that could occur in Raritan Bay. Additionally, crevices and void spaces at the interface of the breakwaters segments with the seafloor would be available for use by benthic fish and invertebrate species.

The loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW would result in adverse impacts to aquatic resources and would be mitigated pursuant to the Clean Water Act through measures that may include available credits from an approved mitigation bank, and

restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York.

The shoreline restoration over time would result in a net gain of intertidal habitat of approximately 0.5 acres and a net loss of subtidal (open water) habitat of approximately 0.5 acres. The conversion of open water habitat would represent a small reduction in this type of habitat in the study area within Raritan Bay, and similar habitat at equivalent water depths would continue to be available in the vicinity. While the breakwaters would replace open water with structured habitat, this loss would be small compared to the extensive open water habitat available within the study area and Raritan Bay as a whole. Additionally, the structures would not hinder the movement of fish and other aquatic biota through the water column, nor would they disrupt water circulation in Raritan Bay. Fish and other aquatic biota, including anadromous species and early life stages, would be able to pass (either actively or passively) around the individual breakwater segments at any given time.

Therefore, the Proposed Actions would promote this policy.

Policy 5: Protect and improve water quality in the New York City coastal area.

5.1: Manage direct or indirect discharges to waterbodies.

As discussed above and in Chapter 9, “Natural Resources,” of the EIS, a SWPPP would be implemented as part of the construction and operation of the Water Hub (if located on shore) and Shoreline Project, and landside construction activities would be conducted in accordance with the General Permit. No discharge would be associated with the in-water portion of the Breakwaters Project. Additionally, the implementation of green infrastructure (e.g., bioswales) where possible, along with landscaping with native coastal vegetation, would facilitate infiltration of stormwater throughout the Shoreline Project and for portions of the Water Hub (if located on shore). With these measures in place, stormwater discharges from the proposed Water Hub and Shoreline Project would not have the potential to result in significant adverse impacts to Raritan Bay.

During placement of the breakwater materials and sand for the shoreline restoration, measures would be implemented to minimize resuspension of bottom sediment. Increases in suspended sediment that would result from in-water construction activities would be temporary and localized, would dissipate upon cessation of the sediment disturbing activities, and would not result in significant adverse effects to water quality or aquatic biota.

Therefore, the Proposed Actions would promote this policy.

5.2: Protect the quality of New York City’s waters by managing activities that generate nonpoint source pollution.

The SWPPP prepared for the Proposed Actions would include erosion and sediment control measures consistent with the New York Standards and Specifications for Erosion and Sediment Controls to minimize the potential for discharge of sediments to Raritan Bay during construction. The post-construction stormwater control measures implemented under the SWPPP would comply with the applicable version of the New York State Stormwater Management Design Manual. There would be no discharge associated with the Breakwaters Project.

Therefore, the Proposed Actions would promote this policy.

5.3: *Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.*

No dredging would occur as a result of the Proposed Actions. The Breakwaters Project would result in the conversion of 11.4 acres of sand/gravel and overlying open water habitat to complex rocky surface. As described in Chapter 9, “Natural Resources,” of the EIS, the breakwaters would be constructed in a manner that would minimize the potential for resuspension of bottom sediment in accordance with state and federal permits, including timing restrictions for in-water activities. The geotextile fabric underlying the breakwater structures would be prefabricated offsite in large panels and spooled onto a roller that may be floated to the installation location. Sheets would then be cut to the required length and lowered to the bottom using temporary framing or pinning, and held in place permanently using rocks for the breakwater construction. The rock and bio-enhancing concrete would be placed on top of the geotextile in a manner that limits sediment resuspension. Rocks used for armoring and to construct the breakwaters would be made of “clean” material, further minimizing the potential for release of suspended sediment into the water column. Crane barges would be moved during construction as needed to construct the breakwater segments, and vessels carrying construction materials would make an average of less than one trip per day over the entire construction period, minimizing the potential for sediment disturbance by vessel movement. Construction vessels would maintain at least 2 feet of clearance from the bottom of the Bay during all tide phases in order to further minimize sediment disturbance. Sediment disturbing activities would not impact state- or federally-listed resources. Placement of 11,637 cubic yards of sand within 2.6 acres of beach below MHW is intended to reduce erosion and augment the accretion potential of the breakwaters in targeted sections of the shoreline; shoreline restoration activities would be completed outside the spawning period for horseshoe crab and winter flounder and would not adversely affect the listed resources.

The eco-revetment between Brighton Street and Manhattan Street would be constructed within the northern limit of the 0.8-acre delineated tidal wetland. An approximately 630 square-foot section of the hybrid dune/revetment would also be constructed in this wetland at its eastern limit. In total, approximately 6,270 square feet (0.14 acres) of this wetland would be impacted. An existing sand bridge comprising unpermitted fill (approximately 595 square feet and 44 CY) that runs north to south currently divides the delineated wetland and would be removed in order to construct the eco-revetment. The removal of this sand bridge would remove an impediment to tidal exchange within the eastern portion of the wetland, and result in a net change in fill within the wetland of approximately 5,675 square feet (0.13 acres), and 1,176 CY. Permanent impacts to the tidal wetland would be primarily within the portion of the wetland dominated by common reed and would be offset by the enhancement of the tidal wetland plant community that would result from the proposed modification of the inlet to Raritan Bay to increase tidal exchange within this wetland. Phragmites would be removed from the wetland, and native saltmarsh plants would be re-established through seeding or planting plugs to supplement the native saltmarsh vegetation that already occurs in the wetland. The existing native saltmarsh vegetation would be retained to the extent possible, and individual plants and seeds would be collected for preservation and replanting as part of the enhancement. Currently, there is limited connectivity between this wetland and the

open waters of Raritan Bay due to the presence of the temporary dunes and the sand-clogged inlet structure. The wetland is currently split by a section of unpermitted fill forming a sand bridge that further restricts tidal flow to the eastern end of the wetland. The Proposed Actions would include removal of these obstructions to improve tidal exchange between the wetland and Raritan Bay, allowing access for fish that may move through the Bay and connected waters. These enhancements may also improve foraging habitat for waterbirds that occur in the wetlands. Temporary impacts would be minimized through the use of marsh mats or low ground-pressure equipment within the wetland and installation of erosion and sediment control measures throughout the construction area in accordance with a SWPPP prepared under the General Permit. Portions of the wetland disturbed during dune and eco-revetment construction would be restored as necessary (e.g., repair of ruts, stabilization of soil). Wetland vegetation would be planted to replace vegetation temporarily disturbed during construction. With these measures in place, temporary impacts to wetlands during construction and the permanent loss of a small portion of the wetland due to the eco-revetment and hybrid dune/revetment would not result in significant adverse impacts to wetland resources.

Therefore, the Proposed Actions would promote this policy.

5.4: *Protect the water quality and quantity of groundwater, streams, and the sources of water for wetlands.*

Any groundwater recovered during dewatering would be tested and treated prior to discharge in accordance with NYSDEC requirements. Excavation of soils to construct the on-shore components of the Proposed Actions would not have the potential to adversely affect groundwater due to soil contamination, as described in Chapter 9, “Natural Resources,” of the EIS. Sampling of the southernmost portion of the unpermitted fill within a portion of the shoreline indicated that these samples met the NYSDEC Soil Cleanup Objectives (SCOs) for residential use and for protection of groundwater, with the exception of acetone in some of the samples, which exceeded the protection of groundwater SCO, but which is a typical laboratory contaminant and thus may have not actually been present in the samples. In addition to this exceedance, there were also exceedances of the more restrictive “Unrestricted SCOs” for the metals lead and nickel, and for the pesticide DDT and its metabolites DDE and DDD. As such, the removal of this material (and, assuming testing of the remaining soil indicates similar findings, the remaining soil to be removed from within the Surf Avenue right-of-way) would not have the potential to adversely affect groundwater resources. Green infrastructure measures incorporated into the Shoreline Project and the proposed on-shore Water Hub components of the Breakwaters Project would allow runoff from these project elements to infiltrate into the soil and recharge to groundwater. The landscaped areas within the Shoreline Project and at the on-shore Water Hub (if selected) would be maintained using Integrated Pest Management (IPM) techniques thereby substantially diminishing the need for the use of pesticides and other chemicals and minimizing adverse effects to groundwater quality. Therefore, the Proposed Actions would not result in significant adverse impacts to groundwater. With the implementation of a SWPPP as required by the General Permit, construction and operation of the Water Hub and Shoreline Project would not have the potential to adversely affect streams or other sources of water to existing wetlands.

Therefore, the Proposed Actions would promote this policy.

5.5: *Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.*

The Proposed Actions would involve establishment of a combination of intertidal and subtidal reef-like habitat and promote the colonization of filter-feeding organisms, such as bivalves and other shellfish, which have the potential to result in a beneficial effect on water quality by filtering water pollutants. Green infrastructure and native coastal vegetation along the elements of the Shoreline Project would allow for infiltration of runoff from the Shoreline Project elements. Implementation of the SWPPP would minimize the potential for stormwater discharges to adversely affect the water quality and aquatic resources of Raritan Bay following construction of the Shoreline Project and Water Hub.

Therefore, the Proposed Actions would promote this policy.

Policy 6: Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.

6.1: *Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the condition and use of the property to be protected and the surrounding area.*

The upland portion of the study area is located within the 100-year floodplain in Zones AE and VE. Zones AE and VE are considered Special Flood Hazard Areas (SFHA). Most of the south shore of Staten Island is designated as a Coastal Erosion Hazard Area (CEHA). The Proposed Actions would create a structural system of living breakwaters and shoreline risk reduction measures that would attenuate wave action, minimize shoreline erosion, and address the impacts of coastal flooding along the South Shore of Staten Island. Considering up to 30 inches of sea level rise, the Breakwaters Project was designed to reduce wave heights 3 feet or less in up to a 100-year storm event, thereby reducing wave energy at the shoreline and minimizing risk to onshore assets previously exposed to wave action. The location and crest elevations of each breakwater segment were selected based on the relative need for storm wave attenuation along the shoreline.

As discussed in Chapter 9, “Natural Resources,” of the EIS, the breakwater system would maintain and restore the beach while minimizing down-drift impacts. The breakwaters would attenuate waves and alter sediment transport along the shore for this purpose. Local sediment transport rates and accretion would be altered but the natural processes would not be blocked as there would still be sediment transport along the shore and tidal circulation around the breakwaters. The 3.1 acres of sand placement as part of the shoreline restoration proposed for the narrow section of shoreline between Loretto Street and Manhattan Street would add sediment to the overall system and augment accretion potential in a narrow section of the beach. The earthen berm, hybrid dune/revetment, eco-revetments, raised edge, and associated landscaping and ecological enhancements of the Shoreline Project would stabilize the shoreline and augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. Green infrastructure measures and native coastal vegetation would increase infiltration of runoff from the Shoreline Project elements.

Therefore, the Proposed Actions would promote this policy.

- 6.2:** *Integrate consideration of the latest New York City projections of climate change and sea level rise (as published by the NPCC, or any successor thereof) into the planning and design of projects in the city's Coastal Zone.*

Guidance provided by NYCDCP recommends a 3-step process to determine a project's consistency with Policy 6.2. A summary of this process is included below. **Attachment 1** to this Coastal Management Program assessment contains copies of figures from the FEIS that provide information to evaluate the Proposed Actions' promotion of Policy 6.2. These include **Figure 10-3** for existing floodplains in the study area; **Figure 15-1** for projected flood zones for the 2020s, 2050s, 2080s, and 2100; **Figure 1-8** to indicate the shoreline under current and projected (2035) Mean High Water (MHW) levels; and **Figure 1-16** to indicate the Shoreline Project features under current conditions and with the MHW level after 30 inches of sea level rise. **Figures 1-12 and 1-13** present the Water Hub at Potential Location 1, which would be within the 100-year floodplain under sea level rise scenarios, along with Base Flood Elevation (BFE) and BFE +3 feet. Water Hub Potential Location 3 is a vessel that would visit the breakwaters periodically and is not, therefore, evaluated in Policy 6.2.

1. *Identify vulnerabilities and consequences: assess the project's vulnerabilities to future coastal hazards and identify what the potential consequences may be.*

(a) Complete the Flood Elevation Worksheet

Attachment 2 to this Coastal Management Program assessment contains the completed Flood Elevation Worksheet. The New York City Panel on Climate Change (NPCC) projected that sea levels are likely to increase by up to 30 inches by the 2050s and up to 75 inches by the end of the century (highest projections). Based on the range of sea level rise predictions, MHHW in the study area (currently +2.42 feet North American Vertical Datum of 1988 [NAVD88]) could range from +3.09 to +4.92 feet NAVD88 by the 2050s and from +3.67 to +8.67 feet NAVD88 by the end of the century. Considering the current 100-year flood elevation most common to project features in the study area (+15 feet NAVD88), the 100-year flood elevations could range from +15.67 to +17.5 feet NAVD88 by the 2050s and from +16.25 to +21.25 feet NAVD88 by the end of the century.

(b) Identify any project features that may be located below the elevation of the 1% floodplain over the lifespan of the project under any sea level rise scenario.

As described under Policy 6.1, the study area is fully within the 100-year floodplain in Zone AE and Zone VE. The Proposed Actions have a build year of 2020. The breakwater segments, proposed Water Hub (if newly constructed at Potential Location 1), and Shoreline Project elements have been designed with a target functional design life of 50 years. The Layered Strategy considered up to 30 inches of sea level rise, consistent with the latest 90th percentile prediction for the 2050s from the NPCC's 2015 report.

With the exception of the hybrid dune/revetment of the Shoreline Project, and the Water Hub (Potential Location 1 and 2) and Type B and C breakwaters of the Breakwaters Project, the remaining portions of the Breakwaters Project and Shoreline Project would be below the 100-year flood event elevation, by design, under the low prediction for sea level rise through 2100. The hybrid dune/revetment and Type B and C breakwaters would remain above the 100-year flood event elevation under the high prediction for sea

level rise until the 2050s. The Shoreline Project and the Breakwaters Project were designed with the consideration of 30 inches of sea level rise and are intended to provide resilience to the Tottenville shoreline into the 2050s.

(c) Identify any vulnerable, critical, or potentially hazardous features that may be located below the elevation of Mean Higher High Water (MHHW) over the lifespan of the project under any sea level rise scenario.

Portions of the Layered Strategy are designed to be fully or partially submerged by the 2050s with 30 inches of sea level rise. None of the Proposed Actions include structures or materials that would be dispersed or potentially hazardous features with an increase in the MHHW elevation. The Proposed Actions do not include permanent human occupancy.

The Water Hub (if located on-shore) would serve as a community facility and, as such, would be considered a “vulnerable feature” under Policy 6.2. The Water Hub facility at Potential Location 1 was designed as a pile-supported building with a floor elevation of +18 feet NAVD88. At this height, the Water Hub would remain above the highest predictions for sea level rise through the 2080s and throughout its 50-year design life, and would not likely be susceptible to flooding. At Potential Location 2, the two existing NYC Parks structures with the potential to be rehabilitated and adaptively used as the Water Hub facility are located at elevations of approximately +36 and +64 feet NAVD88, which would be well above the highest predictions for sea level rise through the 2080s. Over the lifespan of the project, there would be no vulnerable, critical, or potentially hazardous features that would be located below the elevation of MHHW under any sea level rise scenario (see **Attachment 2**). Water Hub Potential Location 3 is a vessel that would visit the breakwaters periodically and is not, therefore, evaluated in Policy 6.2.

(d) Describe how any additional coastal hazards are likely to affect the project, both currently and in the future, such as waves, high winds, or debris.

As discussed above, the study area is fully within the 100-year floodplain in Zone AE and Zone VE. Zone AE represents the area with a 1% chance of flooding each year, and Zone VE represents an area of high flood risk subject to inundation by the 1% annual-chance flood event with additional hazards due to storm-induced velocity wave action, a 3-foot or higher breaking wave. The Proposed Actions have been designed to reduce the impacts of coastal hazards, and would not result in the placement of materials or substances that would result in a threat to public health or the environment if made insecure from wind, water, or debris from storms.

2. Identify adaptive strategies: assess how the vulnerabilities and consequences identified in Step 1 are addressed through the project’s design and planning.

(a) For any features identified in Step 1(b), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection? Describe how would any planned adaptive measures protect the feature in the future from flooding?

The breakwaters have been designed to attenuate wave action and reduce shoreline erosion from day-to-day tidal processes as well as storm events. The one-time shoreline restoration would increase the overall amount of sediment available in the system to

further reduce erosion risk and encourage accretion in targeted areas of the beach. The system of shoreline risk reduction measures would incorporate elements to reduce wave action and provide some level of risk reduction from coastal flooding. The green infrastructure features of the Shoreline Project would allow infiltration of runoff from the Shoreline Project elements, and native coastal vegetation would be consistent with salt-water environments. The Shoreline Project and the Breakwaters Project were designed with the consideration of 30 inches of sea level rise and are intended to provide resilience to the Tottenville shoreline into the 2050s continuing to function with increased sea levels and overtopping.

The breakwaters would continue to provide some level of wave attenuation with a rise in sea level in excess of 30 inches. Determination of whether modification should be made to the breakwaters would be in accordance with the Adaptive Management Plan developed for the project.

(b) For any features identified in Step 1(c), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection? Describe how would any planned adaptive measures protect the feature in the future from flooding?

The Water Hub (if located on-shore) would be designed to comply with Executive Order 11988 in the siting and configuration of the facility. As described under Step 1(c), the Water Hub at Potential Location 1 would be pile-supported and would remain above the highest predictions for sea level rise through the 2080s and throughout its 50-year design life, and would not likely be susceptible to flooding. The breakwater and shoreline features of the Layered Strategy have been designed to reduce the risks of coastal flooding and wave action.

(c) Describe any additional measures being taken to protect the project from additional coastal hazards such as waves, high winds, or debris.

As discussed under Policy 6.1, in addition to attenuating wave action, the breakwaters would alter sediment transport along the shore in order to limit the impacts of shoreline erosion. The 3.1 acres of sand placement as part of the shoreline restoration proposed between Loretto and Manhattan Streets would add sediment to the system and encourage accretion in vulnerable sections of the beach. The earthen berm, hybrid dune/revetment, eco-revetments, raised edge with revetment, and associated landscaping and ecological enhancements of the Shoreline Project would stabilize the shoreline and augment the wave attenuation and risk reduction potential provided by the Breakwaters Project.

(d) Describe how the project would affect the flood protection of adjacent sites, if relevant.

The Proposed Actions would provide risk reduction from coastal flooding and storm events to the south shore of Staten Island, including to areas landward of the Shoreline Project elements, and would not lead to increased flooding in adjacent areas. The Type B and C breakwaters were designed to have higher crest elevations compared to the Type A breakwaters (+14 feet NAVD88 compared to +5 feet NAVD88). This was based on the relative need for storm wave attenuation along the shoreline, the intent to stabilize shoreline change across the project area, and to promote shoreline accretion in key locations. These breakwaters would remain above the flood elevation with up to 30

inches of sea level rise. The Type A breakwaters, which were designed to function with sea level rise, would be placed where erosion of the shoreline needs to be reduced but less wave attenuation is needed. As sea level continues to rise, each breakwater type would continue to attenuate waves, thereby reducing wave energy at the shoreline and structural damage to on-shore assets.

3. Assess policy consistency: conclude whether the project is consistent with Policy 6.2 of the Waterfront Revitalization Program.

As described above and in **Attachment 2**, the Proposed Actions have been designed to function with 30 inches of sea level rise. The breakwaters would continue to attenuate waves with this rise in sea level, thereby reducing wave energy at the shoreline and structural damage to on-shore assets. The Shoreline Project has similarly been designed to provide additional resiliency to the shoreline with sea level rise even when overtopped during storm events. Adaptive management measures would be evaluated in accordance with the Adaptive Management Plan developed for the Proposed Actions. Therefore, the Proposed Actions would promote this policy.

Therefore, the Proposed Actions would promote this policy.

6.3: *Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.*

Consistent with the City's Coastal Protection Initiatives and planning studies for the Tottenville area, the goal of the Layered Strategy is to reduce wave energy and coastal erosion along the vulnerable shoreline in Tottenville, while enhancing ecosystems and shoreline access, use, and stewardship. This goal would be achieved using a layered approach that would address wave action, impacts of coastal flooding and event-based (i.e., short-term/storm-related) and gradual (long-term) shoreline erosion, while restoring and enhancing ecosystems, improving waterfront access, and engaging with the community through educational programs directly related to the coastal resiliency actions. As described above under Policy 6.1, the Layered Strategy has been designed to attenuate wave energy, reduce or reverse shoreline erosion, and address the impacts of coastal flooding along an area of the shoreline where buildings and infrastructure, including residential structures, are particularly vulnerable to storm events and sea level rise.

A proposed 3.1-acre area of shoreline restoration between Loretto Street and Manhattan Street would add sediment to the overall system and augment the accretion potential provided by the breakwaters in one of the narrowest sections of the beach. This 3.1-acre area was selected for one-time shoreline restoration between Manhattan and Loretto Streets to reduce erosion and grow the beach within this portion of Conference House Park. The results of modeling indicate that this section of the beach would be slow to respond to the breakwaters and may not achieve the necessary width for risk reduction and maintaining public access. The earthen berm, eco-revetment between Brighton and Manhattan Streets, the hybrid dune/revetment, the eco-revetment between Loretto Street and Sprague Avenue, and the raised edge with revetment of the Shoreline Project would provide some level of risk reduction from coastal flooding and erosion protection. The Layered Strategy would incorporate the latest 90th percentile prediction of sea level rise for the 2050s in the city's Coastal Zone by considering the New York City Panel on

Climate Change's ("NPCC's") 2015 report, and the Water Hub would be designed to comply with Executive Order 11988 in the siting and design of the facility.

Therefore, the Proposed Actions would promote this policy.

6.4: *Protect and preserve non-renewable sources of sand for beach nourishment.*

One of the goals of the Layered Strategy is to reduce or reverse shoreline erosion and increase beach width. The breakwater system would reduce wave energy that contributes to shoreline erosion, and the upland shoreline protection system would be vegetated with appropriate vegetation to withstand wind and water erosion. As described under Policy 6.1, the Proposed Actions have been designed to ensure that the accretion of sand that would result from the Breakwaters Project would grow the beach while minimizing down-drift impacts. Local sediment transport rates and accretion would be altered, but the natural processes would not be blocked as there would still be sediment transport along the shore.

Therefore, the Proposed Actions would promote this policy.

Policy 7: Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.

7.1: *Manage solid waste material, hazardous waste, toxic pollutants, and substances hazardous to the environment to protect health, control pollution, and prevent degradation of coastal ecosystems.*

As described in Chapter 8, "Hazardous Materials," of the EIS, excavation of soils along the portions of the Shoreline Project and any shallow excavation that would occur at the Water Hub at either potential on-shore location are not anticipated to encounter significant soil or groundwater contamination. Should evidence of contaminated soil and/or sand, creosote-treated wood, or other contaminants be encountered, these materials would be properly characterized, managed, and disposed of in accordance with applicable regulations.

Therefore, the Proposed Actions would promote this policy.

Policy 8: Provide public access to and along New York City's coastal waters.

8.1: *Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.*

The Proposed Actions would reduce wave energy and coastal erosion along the shoreline in Tottenville, while enhancing ecosystems and shoreline access and use. This goal would be achieved using a layered approach that would address wave action, impacts of coastal flooding and event-based (i.e., short-term/storm-related) and gradual (long-term) shoreline erosion, while restoring and enhancing ecosystem functions, improving waterfront access and engaging with the community through educational programs directly related to the coastal resiliency actions. The proposed community Water Hub site would provide waterfront and water access for human-powered boating at both Potential Locations 1 and 2. The floating Water Hub associated with Potential Location 3 would itself be a method of water access for educational/monitoring purposes. The floating Water Hub would be docked at existing facilities in the City (serving local groups and community members when docked locally) and would visit

the project area approximately once per week from April through November for student based teaching events, and host community events approximately twice per month. Storage for kayaks would potentially be available onsite at the terminus of Page Avenue, and a floating boat launch would be deployed seasonally as part of the Water Hub facility (Potential Locations 1 and 2) to provide access for shallow draft research vessels. The Shoreline Project would incorporate a continuous pathway through each component, and would also provide ADA accessible access points and overlook areas to enhance physical, visual, and recreational access to the waterfront for the public.

With the proposed in-water breakwater system, because of distance and the low, linear scale of the breakwaters, and the common color and reflectance (lack of contrast) of the breakwaters to land forms in the distance, the visibility of the breakwaters would be similar to existing views of land masses that can be seen from many on-shore vantage points toward Raritan Bay (see Chapter 6, “Urban Design and Visual Resources,” of the EIS). While the in-water breakwaters would present a new visual element in these views, changes to these views would be minimal and would not impair the character or quality of locations from which visibility is possible. Nor would the visibility of the breakwaters clearly interfere with or reduce the public’s enjoyment and/or appreciation of Raritan Bay. Residents closest to the proposed on-shore Water Hub Potential Location 1, including residents on Ottavio Promenade, would continue to have stationary views of Raritan Bay and certain nearby waterfront elements such as grassy and sandy areas and trees. Views near Potential Location 1 on Page Avenue would change for viewers closest to the Water Hub; however, the Water Hub would be contextual with the surrounding area in terms of scale, siting, and material, and would not adversely affect views of the waterfront or Raritan Bay. Views near Potential Location 2 in Conference House Park would not change for viewers near the Water Hub, as the facility would be located within an existing building in Conference House Park, and views toward the waterfront from vantage points near Potential Location 2 likewise would not change with the Water Hub. The offshore “floating” Water Hub option at Potential Location 3 would not adversely affect views toward the shoreline or visual access to the waterfront, as the vessel would only be intermittently located in the area and would be similar to other vessels in Raritan Bay. Some views on Billop Avenue near the proposed earthen berm would change, however the earthen berm would be located in a densely wooded area that already limits views. Although the proposed hybrid dune/revetment system would be slightly taller than the existing temporary dune system, views from nearby lookout points from Manhattan, Yetman, and Rockaway Streets are already slightly obscured. The eco-revetments and raised edge would not result in adverse impacts to any existing views. Overall, each element of the Layered Strategy would provide views to the waterfront and Raritan Bay that would be similar to existing conditions and would enhance connectivity with existing visual resources.

Therefore, the Proposed Actions would promote this policy.

- 8.2:** *Incorporate public access into new public and private development where compatible with proposed land use and coastal location.*

As described above under Policy 8.1, the Proposed Actions would provide public access along the shoreline that is compatible with the preservation of natural resources and existing open space, and would incorporate the education of such preservation into the use of the Water Hub. The Shoreline Project would include landscaping with coastal

vegetation that would soften the boundaries between each element and avoid habitat impairment. New public amenities would be introduced into the park that would complement existing public use of the site, and ADA accessible access points to the waterfront would be incorporated into each section of the Shoreline Project. NYC Parks will both own and manage the structures that are constructed as part of the Shoreline Project. The proposed Water Hub, if constructed on shore within Conference House Park, would be owned and operated by the State and/or City, with assistance from a non-profit organization. The Water Hub will also be used by a non-profit organization for educational programming and that organization would support some portion of the maintenance. If a floating vessel is selected for Water Hub activities, the non-profit organization would operate and maintain the vessel. The onshore components would be walkable from the Tottenville neighborhood.

Therefore, the Proposed Actions would promote this policy.

- 8.3:** *Provide visual access to coastal lands, waters and open space where physically compatible and appropriate.*

As described above under Policy 8.1, some elements of the Shoreline Project would result in minimal changes to views in certain parts of the study area; however, the Proposed Actions would preserve visual access to coastal lands, waters, and open space. The Proposed Actions would provide new visual access to an enhanced coastal environment. Bird watching stations and overlooks or terraces are proposed, along with landscape elements, and wayfinding, interpretive signage and monitoring elements that would complement the community stewardship the Layered Strategy would aim to promote. ADA accessible trails, access points, and overlooks would be included in the design of the pathway through the Shoreline Project site to provide further visual access to the waterfront.

Therefore, the Proposed Actions would promote with this policy.

- 8.4:** *Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.*

As discussed above, the Proposed Actions would protect the beach along the shore within Conference House Park by reducing the risk of erosion, providing public access to the waterfront via the proposed community Water Hub and shoreline trails, and preserving and enhancing the condition of natural areas on publicly owned lands.

Therefore, the Proposed Actions would promote this policy.

- 8.5:** *Preserve the public interest in and use of lands and waters held in public trust by the state and city.*

As described above under Policy 8.1, the Proposed Actions would protect and enhance public lands and waters by protecting them from further erosion and reducing the risk of damage from future storms, providing public access to the waterfront, and promoting community stewardship of the public lands of the south shore of Staten Island.

Therefore, the Proposed Actions would promote this policy.

- 8.6:** *Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.*

The proposed Water Hub, including the seasonal floating dock associated with Potential Locations 1 and 2 and the floating Water Hub of Potential Location 3, would enhance community stewardship by engaging the public in waterfront education and cultivating long-term estuary stewardship. The seasonal floating boat launch associated with the Water Hub at Potential Locations 1 and 2 would provide direct access to the water from the shore for shallow draft research vessels, and the vessel associated with Potential Location 3 would provide direct access to the breakwaters. The connected trail system through upland open spaces along the shoreline would include multiple levels of access to the waterfront (i.e., continuous trail, earthen berm, beach access over dune/revetment, stairs leading to sidewalk, etc.), and native landscaping throughout would enhance connectivity to the existing scenery. In addition, a series of wayfinding, interpretive signage, and monitoring elements would be located along the shoreline to promote stewardship.

Therefore, the Proposed Actions would promote this policy.

Policy 9: Protect scenic resources that contribute to the visual quality of the New York City coastal area.

9.1: Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.

An urban design and visual resources analysis was prepared in accordance with *City Environmental Quality Review (CEQR) Technical Manual* methodologies and in compliance with the New York State Department of Environmental Conservation (NYSDEC) *Assessing and Mitigating Visual Impacts* policy memorandum (DEP-00-2, issued 7/31/00) on assessing impacts on urban design and visual and aesthetic resources, and developing mitigation as appropriate. The analysis, presented in Chapter 6, “Urban Design and Visual Resources,” of the EIS, provides a description of existing urban design characteristics, visual and aesthetic resources, and views and viewsheds within the project area. In accordance with NYSDEC guidance, aesthetic and visual resources were identified, including Conference House Park and historic structures within the park and study area, and views toward the waterfront and Raritan Bay. The Layered Strategy would result in the proposed in-water breakwater system that would be visible above the water line and distant from the shoreline. The in-water system would be low-lying groupings of non-contiguous horizontal mound structures that would be visible above the water line and distant from the shore line. As such, no urban design components would be affected by this in-water system. The proposed Water Hub structure at Potential Location 1 is anticipated to be small in scale and clad in materials to enhance visual connections to the nearby waterfront areas. The two options for Potential Location 2 are existing buildings in Conference House Park—the Henry Hogg Biddle House and the Rutan-Beckett House. Since the DEIS was issued, in comments dated March 27, 2017, the New York State Historic Preservation Office (SHPO) determined that the Henry Hogg Biddle House and the Rutan-Beckett House are eligible for listing on the State/National Registers of Historic Places (S/NR-eligible). With either option, the programming for the Water Hub would be located within an existing building in Conference House Park. Therefore, Potential Location 2 would not adversely affect the urban design of study area but would enliven this area of the park with new active uses. Should the Water Hub be located at Potential Location 2, a small structure, less than or equal to 400 square feet, would be constructed near the terminus of Page Avenue at

Potential Location 1. This small facility would be much smaller than the Water Hub that would be developed at Potential Location 1 and would not affect urban design components. Potential Location 3 for the Water Hub would be offshore and would involve a “floating” Water Hub vessel that would visit the project area periodically, approximately once per week during April through November. Therefore, the Breakwaters Project would be compatible with the surrounding area and would not result in any significant adverse impacts to urban design.

The four primary components of the Shoreline Project would result in enhancements to shoreline access through new waterfront access points, overlooks, and walkways that would be consistent with similar existing elements. The continuous walkway that would be created along the waterfront would contribute to the pedestrian experience of the waterfront. The changes to urban design in the Shoreline Project area would contribute new urban design elements that would enliven the study area and create visual interest in areas near the shoreline.

With the proposed in-water breakwaters system, views in the study area would include the in-water breakwater components; however, they would be located in Raritan Bay at a distance from the shoreline and are being designed to be low in scale. Because of distance and the low, linear scale of the breakwaters, and the common color and reflectance (lack of contrast) of the breakwaters to land forms in the distance, the visibility of the breakwaters would be similar to existing views of land masses that can be seen from many on-shore vantage points toward Raritan Bay. While the breakwaters would present a new visual element in these views, changes to these views would be minimal and would not impair the character or quality of locations from which visibility is possible. Nor would the visibility of the breakwaters clearly interfere with or reduce the public’s enjoyment and/or appreciation of Raritan Bay.

Views from vantage points near the earthen berm would change, however the berm would be located in a densely wooded area that already limits views. The hybrid dune/revetment system would be slightly taller than the existing temporary dune, but this would result in minimal changes to views from nearby lookout points, which are already slightly obscured. The Water Hub facility at Potential Location 1, as described above, would be located near the shoreline to provide physical and visual connections to the waterfront. Views near the Water Hub at this location would change for viewers closest to the facility; however, the Water Hub is being designed to be contextual to the surrounding area and buildings in terms of scale, siting, and material. Views toward the waterfront from nearby vantage points would include the Water Hub at Potential Location 1; however, the building would be consistent with other nearby buildings in terms of scale and siting. Views near Potential Location 2 in Conference House Park, including views to the waterfront, would not change for viewers near the Water Hub as the programming for the Water Hub would be located within one of two existing historic buildings in Conference House Park. Views near Potential Location 3 would include the “floating” Water Hub vessel. The vessel would not adversely affect views toward the waterfront as the vessel would only be intermittently located within the project area, and would be similar to other vessels in Raritan Bay. Views toward the waterfront from Potential Location 3 would also be intermittent and would be limited to viewers on the Water Hub vessel toward the waterfront. While close up views of the breakwaters would be available, the vessel itself would provide educational and monitoring facilities for visitors to the facility. Should the Water Hub be located at Potential Location 2 or 3, a

small structure would be built near the terminus of Page Avenue at Potential Location 1. Because this facility would be much smaller than the Water Hub at this location (approximately 400 sf), this small facility also would not adversely impact any existing views or views to any aesthetic or visual resources. In addition to this small structure, a series of wayfinding, interpretive, and monitoring elements would be located along the shoreline. The Layered Strategy has been designed to enhance the visual quality of the shoreline through the establishment of native coastal vegetation throughout the project elements, and the Proposed Actions would not adversely affect any existing views toward the waterfront and Raritan Bay, or views to any other aesthetic and visual resources, including historic architectural resources.

Therefore, the Proposed Actions would promote this policy.

9.2: *Protect and enhance scenic values associated with natural resources.*

As described above, the Proposed Actions would complement the scenic character of natural resources along the shoreline and within each of the RECs by building up the natural shorelines with dunes and native coastal vegetation. The Layered Strategy would increase physical and visual access to the water's edge, increase community stewardship of on-shore and in-water ecosystems, and each component would be designed to be consistent with scenic values associated with the existing natural resources.

Therefore, the Proposed Actions would promote this policy.

Policy 10: Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City Coastal Area.

10.1: *Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.*

The Proposed Actions would affect an area at the southeastern end of Staten Island, and as described in Chapter 5, "Historic and Cultural Resources," of the EIS, may involve work in or in the immediate vicinity of known historic architectural resources, including resources within Conference House Park, which has played an important role in prehistory (see Policy 10.2) and in colonial/early-American history. In compliance with Section 106 of the National Historic Preservation Act, the Proposed Actions would include measures to avoid, minimize, or mitigate adverse effects on historic and cultural resources—including both architectural and archaeological resources—developed in consultation with New York State Historic Preservation Office (SHPO), LPC, and Tribal Nations representing Richmond County. Compliance under Section 106 fulfills the requirements of Section 14.09 of the New York State Historic Preservation Act.

Conference House Park contains known and potential historic architectural resources—the Conference House/Christopher Billopp House (National Historic Landmark ["NHL"], listed on the State and National Registers of Historic Places ["S/NR"], and a designated New York City Landmark ["NYCL"]), the Henry Hogg Biddle House (S/NR-eligible, NYCL), the Sam and Hannah Wood House³ (S/NR-eligible), and the

³ The Sam and Hannah Wood House appears in CRIS and on a 1986 Building-Structure Inventory Form in CRIS as the "Sam and Hannah Woods House." However, the Conference House Park web site and brochure identifies the building as the Sam and Hannah Wood House (without the "s").

Rutan-Beckett House (S/NR-eligible).⁴ Located just outside Conference House Park is the James M. Rutan House (S/NR-eligible), which is located across Satterlee Street from the park. The Prince's Bay Lighthouse, near the northern limits of the project area, is S/NR-eligible and is a NYCL.

Two architectural resources, the Henry Hogg Biddle House and the Rutan-Beckett House, are being considered for Water Hub Potential Location 2. If Water Hub Potential Location 2 is selected, one of these two historic architectural resources would be rehabilitated and adaptively used. If plans move forward to locate the programming for the Water Hub at one of these two buildings, consultation with the consulting parties would continue to be undertaken pursuant to the terms outlined in the Programmatic Agreement executed in May 2013 among the Federal Emergency Management Agency (FEMA), SHPO, the New York State Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and ACHP and specifically pursuant to Appendix D to the Programmatic Agreement, which pertains to the CDBG-DR program for activities in New York City.

Since the DEIS was issued, in comments dated March 27, 2017, SHPO determined that the Henry Hogg Biddle House and the Rutan-Beckett House are both S/NR-eligible. Should either the Biddle House Option or the Rutan-Beckett House Option for the Water Hub Potential Location 2 be selected, consultation with SHPO would be undertaken regarding any proposed alterations to the historic resource. In addition, because the Biddle House is a NYCL, if the Biddle House Option is selected for the Water Hub, NYC Parks would consult with the New York City LPC under the New York City Landmarks Preservation Law regarding any proposed alterations to this NYCL. LPC would review the proposed alterations and, upon approval, would issue a Binding Commission Report summarizing LPC's findings. As the anticipated alterations to either building would be limited to rehabilitation and adaptive reuse changes, no adverse effects are anticipated.

Therefore, the Proposed Actions would promote this policy.

10.2: *Protect and preserve archaeological resources and artifacts.*

Conference House Park contains the Ward's Point Archaeological Conservation Area, an archaeological historic district that is a NHL and is listed on the S/NR. Pursuant to Section 106 of the NHPA, a Phase 1A Archaeological Documentary Study ("Draft Phase 1A Study") for the Breakwaters, Shoreline, and Water Hub Potential Location 2 areas of potential effect (APEs) was prepared in May 2017.⁵ The study documented the development history of the APEs as well as their potential to yield archaeological resources, including both precontact and historic archaeological resources. In addition,

⁴ Since the issuance of the DEIS, in a comment letter dated March 27, 2017, SHPO determined that the Henry Hogg Biddle House, the Sam and Hannah Wood House, and the Rutan-Beckett House are S/NR-eligible.

⁵ AKRF, Inc. (2017): "Phase 1A Archaeological Documentary Study: Coastal and Social Resiliency Initiatives for the Tottenville Shoreline: Living Breakwaters and Tottenville Shoreline Protection Projects; Staten Island, Richmond County, New York." Prepared for: the Governor's Office of Storm Recovery; New York, NY.

Appendix B: Coastal Management Program Assessment

the Phase 1A study documented the current conditions of the APEs and summarized previous cultural resource investigations which have been undertaken in the vicinity.

The Phase 1A study concluded that it is not likely that intact archaeological deposits would be located within the sandy beaches of the Shoreline APE. However, limited portions of the upland areas were determined to possess moderate sensitivity for precontact archaeological resources and moderate sensitivity for historic period archaeological resources. In addition, upland areas of the Water Hub Potential Location 2 APE were determined to be highly sensitive for precontact and historic period archaeological resources and two areas within the steeply sloped bluffs were also determined to have sensitivity for historic period archaeological resources. A Phase 1B archaeological investigation was recommended for those areas of archaeological sensitivity within the Shoreline or Water Hub Potential Location 2 APEs that would be impacted by the proposed project. The Breakwaters APE, which is located entirely within the Raritan Bay, was determined to have no sensitivity for archaeological resources dating to the historic period and low to moderate sensitivity for precontact archaeological resources at depths between 25 and 35 feet below the bay floor. As such, the proposed project would not result in impacts to archaeologically sensitive depths and no additional archaeological analysis was recommended for the Breakwaters APE.

All Phase 1B testing within the previously identified areas of archaeological sensitivity or any new areas of archaeological sensitivity that may be identified in the newly added portion of the Shoreline APE would be completed in consultation with SHPO, LPC, and the Tribal Nations. Any additional archaeological investigation or consultation with the consulting parties would be completed pursuant to the terms outlined in the Programmatic Agreement executed in May 2013 among the Federal Emergency Management Agency (FEMA), SHPO, the New York State Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and ACHP and specifically pursuant to Appendix D to the Programmatic Agreement, which pertains to the CDBG-DR program for activities in New York City. Any additional archaeological investigations completed subsequent to the Phase 1B investigation (e.g., a Phase 2 archaeological survey or Phase 3 Data Recovery) would be completed prior to construction in consultation with SHPO, LPC, and the Tribal Nations.

Therefore, the Proposed Actions would promote this policy.

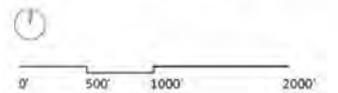
*

Attachment 1
Referenced Figures



- MODELED 2035 MHW
- - - MHW 2015
- ANTICIPATED BEACH GROWTH
- ANTICIPATED EROSION
- ▨ SHORELINE STRUCTURES

DATA SOURCES:
 2035 MHW MODELED BY ARCADIS USING GENESIS
 2012 MHW LINES BY ARCADIS USING ORTHOPHOTOGRAPHY
 2015 MHW LINE AND SHORELINE STRUCTURES SURVEYED
 BY NVACK, SUPPLEMENTED WITH 2014 LIDAR AND
 HISTORIC AERIAL IMAGERY
 CHANNEL EDGE: BASED ON COORDINATES PROVIDED
 BY USACE (JOHN BELDIN-QUIRONES) ON 2/25/2015
 CONTOUR BATHYMETRY GENERATED BY HILL

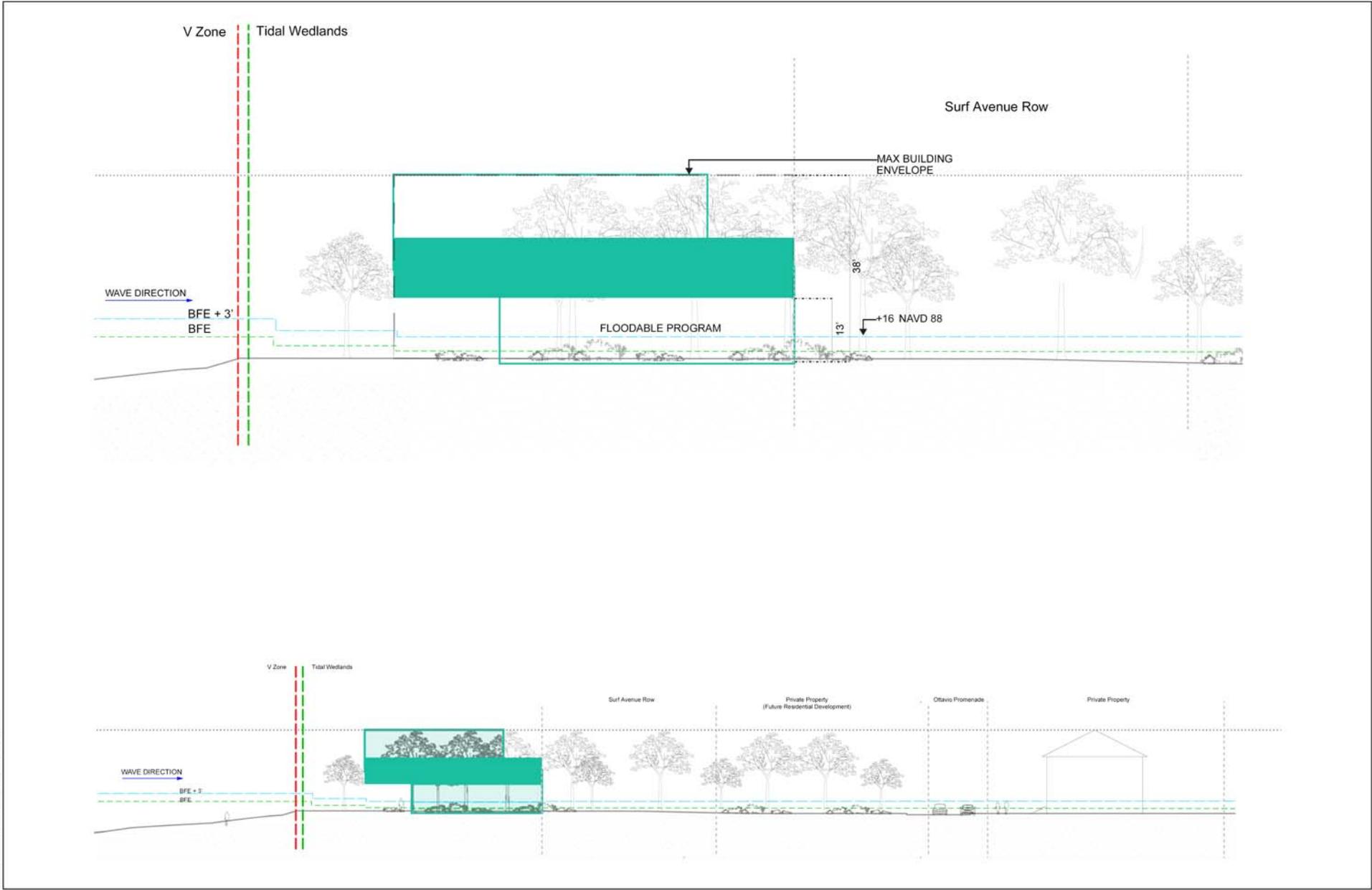


Source: SCAPE / Landscape Architecture PLLC

Shoreline Change with and without Proposed Actions

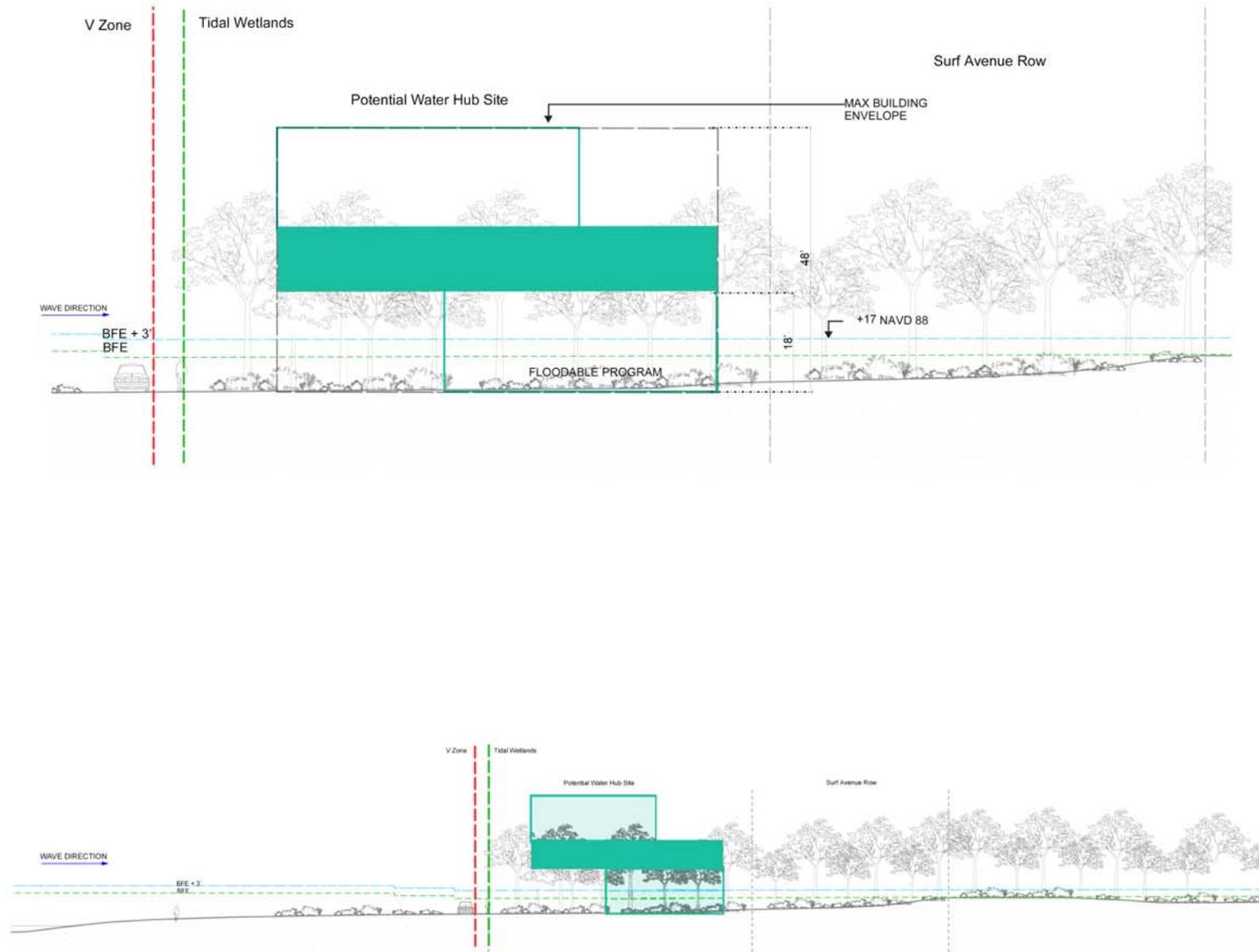
Figure 1-8

FOR ILLUSTRATIVE PURPOSES ONLY



Proposed Water Hub Location 1—
Page West Option Sections

FOR ILLUSTRATIVE PURPOSES ONLY



Proposed Water Hub Location 1—
Page East Option Sections

Source: Stantec / RACE Coastal Engineering



2/28/2018

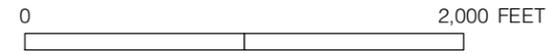
FOR ILLUSTRATIVE PURPOSES ONLY

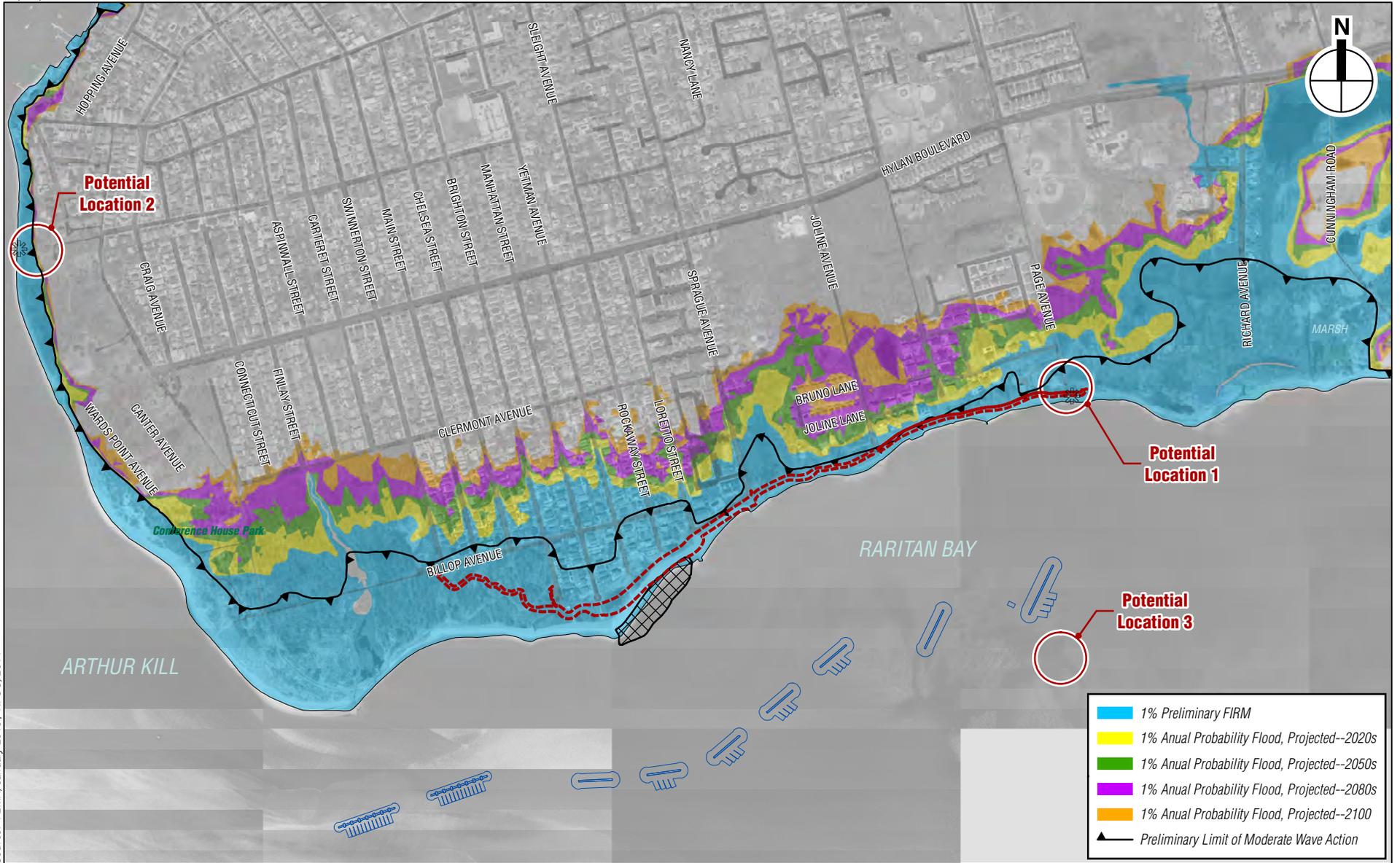


-  Proposed Breakwater Features
-  Proposed Shoreline Project Elements
-  Proposed Shoreline Restoration Area
-  Potential Location of Proposed Water Hub (exact location to be determined)

-  1% Annual Chance Flood Hazard (100-year floodplain)
-  0.2% Annual Chance Flood Hazard (500-year floodplain)
-  Limit of Moderate Wave Action (LiMWA)
-  Coastal Erosion Hazard Area (CEHA)
-  Potential Water Access

-  Proposed Floating Dock (associated with Water Hub Potential Locations 1 and 2 only)





Source: FEIMA, January 2015 / NPCC, 2014

- Proposed Breakwater Features
- Proposed Shoreline Project Elements
- Proposed Shoreline Restoration Area

- Potential Location of Proposed Water Hub (exact location to be determined)
- Potential Water Access

- Proposed Floating Dock (associated with Water Hub Potential Locations 1 and 2 only)

0 1,000 FEET

Projected Potential Future Flood Zones
Figure 15-1

Attachment 2
Flood Elevation Worksheet

NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Worksheet

COMPLETE INSTRUCTIONS ON HOW TO USE THIS WORKSHEET ARE PROVIDED IN THE "CLIMATE CHANGE ADAPTATION GUIDANCE" DOCUMENT AVAILABLE AT www.nyc.gov/wrp

Enter information about the project and site in Tabs 1-3. Tab 4 contains primary results. 5th Tab, "Future Flood Level Projections" contains background computations. The remaining tabs contain additional result, to be used as relevant.

Background Information	
Project Name	Coastal and Social Resiliency Initiatives for Tottenville Shoreline
Location	Tottenville shoreline of the South Shore of Staten Island
Type(s)	<input checked="" type="checkbox"/> Residential, Commercial, <input checked="" type="checkbox"/> Parkland, Open Space, and <input checked="" type="checkbox"/> Tidal Wetland Restoration <input type="checkbox"/> Critical Infrastructure or <input type="checkbox"/> Industrial Uses <input type="checkbox"/> Over-water Structures <input checked="" type="checkbox"/> Shoreline Structures <input type="checkbox"/> Transportation <input type="checkbox"/> Wastewater <input checked="" type="checkbox"/> Coastal Protection
Description	<p>The Proposed Actions comprise implementation of resiliency initiatives intended to work in tandem to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of State Island, NY. These initiatives include the Living Breakwaters Project (Breakwaters Project) and Tottenville Shoreline Protection Project (Shoreline Project). The Breakwaters Project would consist of ecologically enhanced breakwater segments occupying approximately 11.4 acres of sand/gravel habitat of Raritan Bay located between 790 and 1,200 feet offshore in waters approximately 2 to 10 feet deep at mean low water. The Breakwaters Project would reduce wave energy at the shoreline; prevent/reduce/reverse shoreline erosion; increase habitat diversity through provision of complex subtidal, intertidal, and emergent rocky structure elements; and promote social resilience through educational and community programs proposed at a Water Hub. The Shoreline Project would provide on-shore resiliency measures that would augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. It includes a series of shoreline protection measures extending along the Tottenville shoreline largely within New York City Department of Parks and Recreation (NYC Parks) Conference House Park from approximately west of the intersection of Swinnerton Street and Billop Avenue to Page Avenue, including: an earthen berm, two eco-revetments, hybrid dune/revetment system, and raised edge (trail with revetment), along with wetland enhancement and landscaping with coastal vegetation. ADA accessible access points to the beach would be constructed along the shoreline protection system. Portions of the Breakwaters Project and Shoreline Project would be located within the 100-year floodplain and New York State Coastal Erosion Hazard Area.</p>
Planned Completion date	Early 2020

Establish current tidal and flood heights.

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.42	2.42	NAVD88	
1% flood height	15.00	15.00	NAVD88	
<i>As relevant:</i>				
0.2% flood height	-->		NAVD88	
MHW	2.08	2.08	NAVD88	
MSL	-->		NAVD88	
MLLW	-->		NAVD88	

Data will be converted based on the following datums:

Datum	FT (NAVD88)	Feet	Datum	Source
NAVD88	0.00			
NGVD29	1.10			
Manhattan Datum	1.65			
Bronx Datum	1.51			
Brooklyn Datum (Sewer)	0.61			
Brooklyn Datum (Highway)	1.45			
Queens Datum	1.63			
Richmond Datum	2.09			
Station	0.00	0.00	NAVD88	
MLLW	-->		NAVD88	

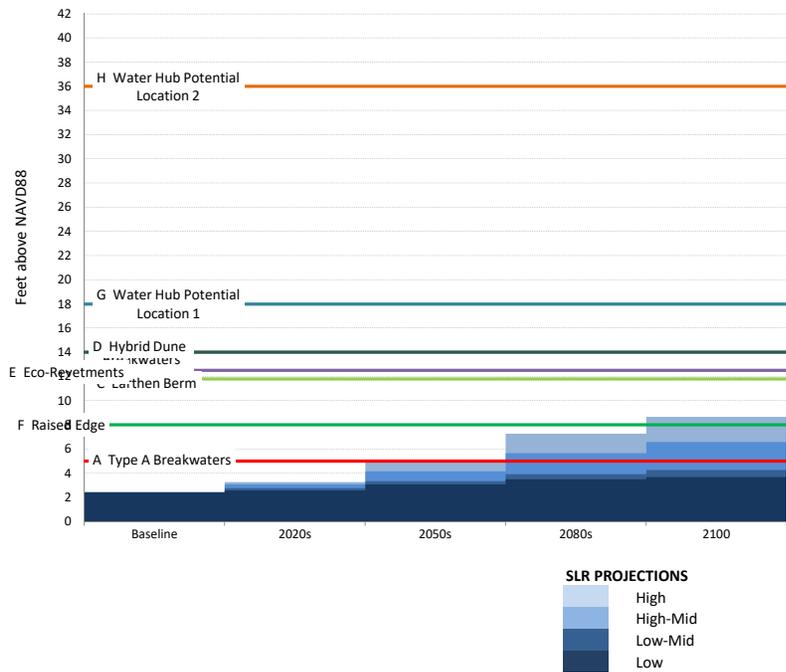
Describe key physical features of the project.

Feature (enter name)	Feature Category	Lifespan	Elevation	Units	Datum	Ft	Ft Above NAVD88	Ft Above MHHW	Ft Above 1% flood height	Ft Above 0.2% flood height
A Type A Breakwaters	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	5.0	Feet	NAVD88	5.0	5.0	2.6	-10.0	#VALUE!
<i>In-water rubble mound structures made of hard stone and ecologically enhanced concrete, with crest elevations of +5 feet NAVD88</i>										
B Type B and C Breakwaters	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	14.0	Feet	NAVD88	14.0	14.0	11.6	-1.0	#VALUE!
<i>In-water rubble mound structures made of hard stone and ecologically enhanced concrete, with crest elevations of +14 feet NAVD88</i>										
C Earthen Berm	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	11.8	Feet	NAVD88	11.8	11.8	9.4	-3.2	#VALUE!
<i>Earthen berm connecting to the hybrid dune, blends with existing landscape</i>										
D Hybrid Dune	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	14.0	Feet	NAVD88	14.0	14.0	11.6	-1.0	#VALUE!
<i>Reinforced, planted dune system providing gradual transition from upland elements to shoreline</i>										
E Eco-Revetments	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	12.5	Feet	NAVD88	12.5	12.5	10.1	-2.5	#VALUE!
<i>Bioswale, sloped plantings, pathway, and concrete steps, incorporates green infrastructure and native landscaping</i>										
F Raised Edge	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	8.0	Feet	NAVD88	8.0	8.0	5.6	-7.0	#VALUE!
<i>Water-side stone revetment bordering a bioswale and raised trail, incorporates green infrastructure and native landscaping</i>										
G Water Hub Potential Location 1	<input checked="" type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other	50 years	18.0	Feet	NAVD88	18.0	18.0	15.6	3.0	#VALUE!
<i>Community facility providing access to the waterfront, orientation, education, information on shoreline resiliency, community gathering space, storage for NYC Parks</i>										
H Water Hub Potential Location 2	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input checked="" type="checkbox"/> Other	50 years	36.0	Feet	NAVD88	36.0	36.0	33.6	21.0	#VALUE!
<i>Community facility providing access to the waterfront, orientation, education, information on shoreline resiliency, community gathering space, storage for NYC Parks</i>										

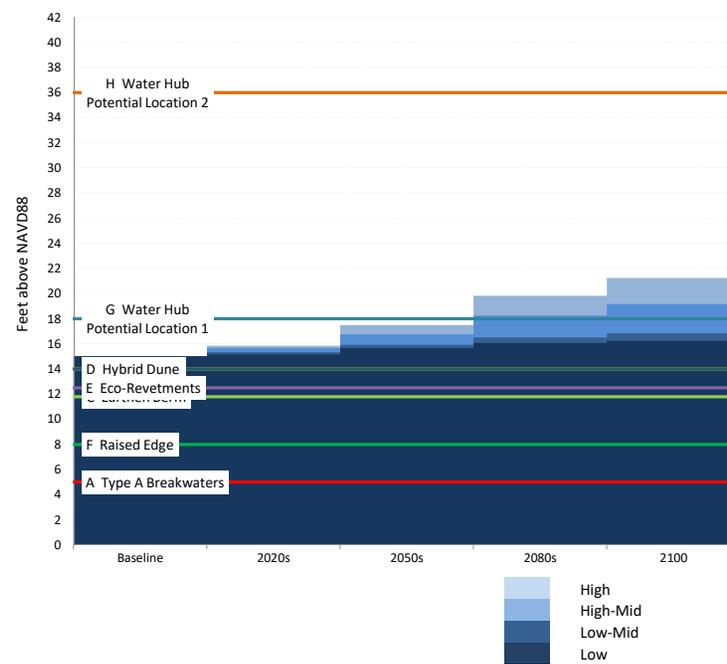
Elevations are based on conservative estimates (i.e., the lowest elevation for each feature in 30% design drawings)

Assess project vulnerability over a range of sea level rise projections.

Mean Higher High Water + Sea Level Rise



1% Flood Elevation + Sea Level Rise



NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: Daniel Greene, Governor's Office of Storm Recovery

2. Address: 25 Beaver Street, New York, NY 10004

3. Telephone: Area Code (212) 480-4644

B. PROPOSED ACTIVITY

1. Brief description of activity:

The Proposed Actions comprise implementation of resiliency initiatives intended to work in tandem to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of State Island, NY. These initiatives include the Living Breakwaters Project (Breakwaters Project) and Tottenville Shoreline Protection Project (Shoreline Project). For the purposes of this assessment, the Proposed Actions represent the implementation of the Layered Strategy, which includes the Breakwaters Project and the Shoreline Project. The Breakwaters Project would consist of ecologically enhanced breakwater segments occupying approximately 11.4 acres of sand/gravel habitat in Raritan Bay located between 790 and 1,170 feet off-shore in waters approximately 2 to 10 feet deep at mean low water. The majority of the breakwater structures would be located more than 1,700 feet from the Federal Navigation Channel, with the closest breakwater segment located more than 700 feet from the channel. The Breakwaters Project would reduce wave energy at the shoreline; reduce/reverse shoreline erosion; increase habitat diversity through provision of complex subtidal, intertidal, and emergent rocky structure elements; and improve waterfront access and engage with the community through educational and stewardship programs directly related to the coastal resiliency actions. The Shoreline Project would provide on-shore risk reduction measures that would augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. It would include a series of shoreline risk-reduction measures along the Tottenville shoreline almost entirely within New York City Department of Parks and Recreation (NYC Parks) Conference House Park from approximately west of the intersection of Swinnerton Street and Billop Avenue to Page Avenue, including: an earthen berm, eco-revetments, hybrid dune/revetment system, and raised edge (revetment with trail), along with wetland enhancement and landscaping with coastal vegetation. Three Americans with Disabilities Act (ADA) compliant access points to the beach would be constructed along the shoreline protection system. Portions of the Breakwaters Project and Shoreline Project would be located within the 100-year floodplain and New York State Coastal Erosion Hazard Area.

2. Purpose of activity

The purpose of the Layered Strategy is to reduce wave energy and coastal erosion along the shoreline in Tottenville while enhancing ecosystems and shoreline access and use. The specific goals and objectives of the Proposed Actions are: (1) Risk Reduction, via attenuation of wave energy, minimization of both event-based and long-term shoreline erosion, preservation of beach width, and addressing the impacts of coastal flooding; (2) Ecological Enhancement, by increasing the diversity of aquatic habitats consistent with Hudson-Raritan Estuary Plan priorities (e.g., fish and shellfish habitat); and (3) Social Resiliency, by fostering community education on coastal resiliency directly tied to and building off the structural components of this initiative, increasing physical and visual access to the water's edge, enhancing community stewardship of on-shore and in-water ecosystems, and increasing access to recreational opportunities.

3. Location of activity

<u>Richmond</u> County	<u>Tottenville</u> City, Town, or Village	<u>South Shore</u> Street or Site Description
---------------------------	--	--

4. Type of federal permit/license required: Section 404 CWA, Section 10 Rivers and Harbors

5. Federal application number, if known: NAN-2017-00296-WCA

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application number, if known:

NYSDEC 401 Water Quality Certification, Articles 15, 25, and 34, OGS

C. COASTAL ASSESSMENT Check either “YES” or “NO” for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:

YES/NO

- a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)
- b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)
- c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)
- d. Reduction of existing or potential public access to or along coastal waters? (19, 20)
- e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9, 10)
- f. Siting of a facility essential to the exploration, development, and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)
- g. Siting of a facility essential to the generation or transmission of energy? (27)
- h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)
- i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)
- j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)
- k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)
- l. Adverse effect upon land or water uses within the State’s small harbors? (4)

X	
X	
	X
	X
	X
	X
	X
X	
	X
	X
	X
	X

2. Will the proposed activity affect, or be located in, on, or adjacent to any of the following:

YES/NO

- a. State designated freshwater or tidal wetland? (44)
- b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17)
- c. State designated significant fish and/or wildlife habitat? (7)
- d. State designated significant scenic resource or area? (24)
- e. State designated important agricultural lands? (26)
- f. Beach, dune or Barrier Island? (12)
- g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)
- h. State, county, or local park? (19, 20)
- i. Historic resource listed on the National or State Register of Historic Places? (23)

X	
X	
	X
	X
	X
X	
	X
X	
X	

3. Will the proposed activity require any of the following:

YES/NO

- a. Waterfront site? (2, 21, 22)
- b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)
- c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)
- d. State water quality permit or certification? (30, 38, 40)
- e. State air quality permit or certification? (41, 43)

X	
	X
X	
X	
	X

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document*)

X	
---	--

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.
2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document.* The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy, and (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Daniel Greene, Governor's Office of Storm Recovery

Address: 25 Beaver Street, New York, NY 10004

Telephone: Area Code (212) 480-4644

Applicant/Agent Signature:  Date: June 1, 2018

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Planning and Development, Attn: Consistency Review Unit, One Commerce Plaza-Suite 1010, 99 Washington Avenue – Suite 1010, Albany, New York 12231.**
 - a. Copy of original signed form.
 - b. Copy of the completed federal agency application.
 - c. Other available information which would support the certification of consistency.
2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.
3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

* These state and local documents are available for inspection at the offices of many federal agencies, Department of Environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

Additional Information

As determined by the Federal Consistency Assessment Form, the Proposed Actions require detailed assessment for several New York State Coastal Management Program policies, including policies 2, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 25, 28, 30, 32, 35, 37, 38, 40, 41, 43, and 44. The consistency assessment is provided below for all questions that were answered “yes” in the CAF.

Policy 2: Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.

The Proposed Actions are intended to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of Staten Island, NY. For the purposes of this assessment, the Proposed Actions represent the implementation of the Layered Strategy, which includes both the Breakwaters Project and the Shoreline Project. The Breakwaters Project and the Shoreline Project must be sited in and adjacent to coastal waters of Raritan Bay in order to serve their purposes of wave attenuation, minimization of event-based and long-term shoreline erosion, preservation of beach width, and providing some level of risk reduction from coastal flooding. The Layered Strategy has also been designed to provide ecological enhancement and increased habitat diversity for aquatic resources, and to foster community stewardship and education on coastal resiliency. The Water Hub component of the Breakwaters Project includes water dependent uses that would provide access for research vessels either through the installation of a seasonally deployed boat launch (Potential Locations 1 and 2) or use of vessel that would serve as a floating Water Hub (Potential Location 3), and both components of the Layered Strategy would encourage recreational use and access to the waterfront. There are currently three potential locations being evaluated for the Water Hub facility, only one of which would be selected. Each would provide visual and physical access for the public to the waterfront. Potential Location 1 (on-shore) would involve construction of a new structure near the southern terminus of Page Avenue, Potential Location 2 (on-shore) would involve rehabilitation and adaptive reuse of an existing NYC Parks building in the northwestern portion of Conference House Park, and Potential Location 3 off-shore would comprise a “floating” Water Hub (a vessel that would visit the breakwaters periodically in suitable weather conditions and be docked at existing facilities in the City). When in the project area, the vessel would anchor near the breakwater structures for observation/monitoring and education activities. Potential storage for kayaks would be available near the terminus of Page Avenue should Potential Locations 2 or 3 be selected.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 11: Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.

Actions associated with the Shoreline Project are fully within the 100-year floodplain in Zones AE and VE. Zones AE and VE are considered Special Flood Hazard Areas (SFHA). Most of the South Shore of Staten Island is designated as a Coastal Erosion Hazard Area (CEHA). The Layered Strategy would create a structural system of breakwaters and shoreline risk reduction measures that would attenuate wave energy, minimize shoreline erosion, and provide risk reduction from coastal flooding along the South Shore of Staten Island. Considering up to 30 inches of sea level rise, the Breakwaters Project was designed to reduce wave heights to 3 feet or less in up to a 100-year storm event, thereby reducing wave energy at the shoreline and minimizing risk to on-shore assets previously exposed to storm wave action. The location and crest elevations of each breakwater segment were selected based on the relative need for storm wave attenuation along the shoreline. Type A breakwaters would be submerged with 30 inches of projected sea level rise, while Type B and C breakwaters would remain emergent structures with this same sea level rise. Even under increased water depths that occur during a storm surge, the structures would continue to dissipate wave energy and provide risk reduction for landward properties. The breakwaters would continue to attenuate waves even when the crests are submerged up to a depth of approximately 70 percent of the approaching wave heights.

A proposed 3.1-acre area of shoreline restoration between Loretto Street and Manhattan Street would add sediment to the overall system and augment the accretion potential provided by the breakwaters in one of the narrowest sections of the beach. This 3.1-acre area was selected for one-time shoreline restoration between Manhattan and Loretto Streets to reduce erosion and grow the beach within this portion of Conference House Park. The results of modeling indicate that this section of the beach would be slow to respond to the breakwaters and may not achieve the necessary width for risk reduction and maintaining public access. The earthen berm, eco-revetment between Brighton and Manhattan Streets, the hybrid dune/revetment, the eco-revetment between Loretto Street and Sprague Avenue, and the raised edge with revetment of the Shoreline Project would provide some level of risk reduction from coastal flooding and erosion protection. Green infrastructure measures and native coastal vegetation would increase infiltration of runoff from the Shoreline Project elements. The Layered Strategy would incorporate the latest 90th percentile prediction of sea level rise for the 2050s in the city's Coastal Zone by considering the New York City Panel on Climate Change's ("NPCC's") 2015 report, and the Water Hub would be designed to comply with Executive Order 11988 in the siting and design of the facility.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 12: Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

The upland portion of the study area is located within the 100-year floodplain in Zones AE and VE. Zones AE and VE are considered Special Flood Hazard Areas (SFHA). Most of the south shore of Staten Island is designated as a Coastal Erosion Hazard Area (CEHA). The Layered Strategy would create a structural system of living breakwaters and shoreline risk reduction measures that would attenuate wave action, minimize shoreline erosion, and address the impacts of coastal flooding along the South Shore of Staten Island. Considering up to 30 inches of sea level rise, the Breakwaters Project was designed to reduce wave heights 3 feet or less in up to a 100-year storm event, thereby reducing wave energy at the shoreline and minimizing risk to on-shore assets previously exposed to wave action, including natural protective features such as beaches. The location and crest elevations of each breakwater segment were selected based on the relative need for storm wave attenuation along the shoreline.

As discussed in Chapter 9, "Natural Resources," of the EIS, the breakwater system would maintain and restore the beach, a natural protective feature, while minimizing down-drift impacts. The breakwaters would attenuate waves and alter sediment transport along the shore for this purpose. Local sediment transport rates and accretion would be altered but the natural processes would not be blocked as there would still be sediment transport along the shore and tidal circulation around the breakwaters. The 3.1 acres of sand placement as part of the shoreline restoration proposed for the narrow section of shoreline between Loretto Street and Manhattan Street would add sediment to the overall system and augment accretion potential in a narrow section of the beach. The earthen berm, hybrid dune/revetment, eco-revetments, raised edge, and associated landscaping and ecological enhancements of the Shoreline Project would stabilize the shoreline and augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. Green infrastructure measures and native coastal vegetation would increase infiltration of runoff from the Shoreline Project elements.

The Shoreline Project would incorporate the establishment of a vegetated hybrid dune/revetment and two eco-revetments to provide additional risk reduction from coastal flooding and erosion. All upland staging and construction activities would be completed in accordance with erosion and sediment control measures under a Stormwater Pollution Prevention Plan (SWPPP) prepared as required under the New York State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity (General Permit), and would minimize potential impacts to beaches from sediment discharge and erosion during construction. The Shoreline Project would replace a temporary dune comprising sand-filled

barrier bags that was installed by NYC Parks following Superstorm Sandy. There are no barrier islands or bluffs in the vicinity of the Proposed Actions.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 13: The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

Breakwaters Project

The breakwater segments have been designed with a target functional design life of 50 years including consideration for 30 inches of sea level rise. Even under increased water depths that occur during a storm surge, when the breakwaters would be fully submerged, the structures would continue to dissipate wave energy and provide risk reduction for landward properties. The breakwaters would continue to attenuate waves even when the crests are submerged up to a depth of approximately 70 percent of the approaching wave heights. Stone structures in the coastal environment, such as the proposed breakwaters, can continue to perform well past their intended design life. The concrete armor units are also anticipated to have a service life greater than 50 years. However, the breakwaters may have a reduced capacity to attenuate waves after they have reached their service life. It is anticipated that the breakwaters would continue to provide habitat enhancement and erosion protection past their 50-year service life. It should also be noted that stone rubble mound structures are adaptable and could be modified in the future to extend their service life.

Basic maintenance and operations of breakwater structures is anticipated to be minimal, including regular visual inspection of structures and post-storm event inspection in accordance with post-construction monitoring and adaptive management plans developed in consultation with the New York State Department of Environmental Conservation (NYSDEC), National Marine Fisheries Service (NMFS) and US Army Corps of Engineers (USACE). The most likely possible drivers for maintenance needs would be scour, settlement, or the dislodgment or displacement of armor units. Maintenance would likely be episodic, following storm events. A basic post-storm event inspection may reveal maintenance work such as stone adjustments or replacement, but such maintenance is usually minimal, particularly for storm events less than the 100-year storm design conditions. Any debris removal will be part of the operations and maintenance plan.

The breakwaters have a 50-year design life, though it is anticipated they will function beyond this time frame. The breakwaters are designed to function in a 100-year storm. The functionality is derived from the use of appropriate material sizes and configurations for a breakwater design that utilizes wave dissipation as the wave attenuation process rather than energy absorption. The dissipation process alters the wave characteristics causing it to degrade as it passes onto or over the breakwater. In this way a well-designed breakwater can become submerged by increased water depths (storm surges) and still continue to provide wave protection for landward properties providing long term durability.

The navigation markers on the breakwaters may require periodic maintenance and potential replacement. These markers will be maintained by the project owner.

The proposed shoreline restoration is intended to be a one-time placement of beach material (sand). Shoreline change modeling undertaken as part of the design process indicates that the breakwaters will effectively prevent significant erosion of this shoreline restoration, thus periodic beach nourishment will not be required.

Shoreline Project

The Shoreline Project has also been designed with a target functional design life of 50 years including consideration for 30 inches of sea level rise. It would be composed of a combination of hard (such as stone and concrete) and soft (such as plantings, earthen berms) features. All features

will require typical grounds maintenance such as monitoring plant growth and litter pickup similar to existing operations in the NYC Parks property.

To accommodate durability in the coastal environment, the project design will refer, as appropriate or applicable, to recommendations within FEMA P-55, Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas and the U.S. Army Corps Engineering Coastal Engineering Manual, and New York City Building Code.

The Shoreline Project would be monitored on a routine basis through the city-wide Waterfront Inspection Program managed by the Economic Development Corporation (EDC), in accordance with EDC's inspection manual, to determine whether repairs would be necessary. In addition, the following maintenance measures are required of each design feature:

- Earthen Berm—The earthen berm will require typical grounds care. The plantings should be monitored and tended for signs of stress.
- Hybrid Dune/Revetment—The plantings should be monitored and tended for signs of stress. The grade of the dune sand is expected to change, even outside of major storm events, due to normal wind, rain, seasonal, and coastal effects. Additionally, there will be no separation between the dune sand and the stone armor core. The stone armor core will have large voids that will fill with sand over time. The specifications for dune sand placement will consider timing and construction methods to place sand and provide infill within the stone voids, but the infill process will continue to some extent over time. Due to the armor stone core, maintenance of the sand is not required for the intended function of the structure. The armor core stone is expected to require no practical maintenance and will be concealed under most circumstances. If the armor core is exposed, the stone should be monitored or inspected annually for signs of movement.
- Eco-Revetments—The plantings should be monitored and tended for signs of stress. The revetment stone is expected to require no practical maintenance. The stone should be monitored or inspected annually for signs of movement.
- Concrete—Is designed in accordance with New York City Building Code Section BC 1904 Durability Requirements and applicable durability requirements of ACI 318 for exposure to chlorides from saltwater and seawater spray. To better accommodate the salt environment consistent with ACI and other design guidelines such as USACE, the concrete is proposed to be specified for a minimum 28-day compressive strength of 5,000 psi and a specified mix with a water to cement ratio of 0.40. Concrete should be monitored or inspected annually and any cracks or spalling should be patched.
- Transition Nodes—The transition nodes will be constructed of concrete with the same durability requirements and maintenance discussed above with the eco-revetment.
- The earthen berm, revetments, and stone armor core structures are designed to be stable under the hydrodynamic loads associated with the 1 percent annual chance exceedance flood without special requirements prior to severe weather.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 14: Activities and development, including the construction or reconstruction or erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.

The Proposed Actions would be designed to address wave energy, event-based (i.e., short-term/storm-related) and gradual (long-term) shoreline erosion and impacts of coastal flooding, while not leading to increased erosion of the shoreline outside the project site. Results of wave modeling indicate that the Proposed Actions would not cause erosion or result in increased wave heights on adjacent areas. As the breakwaters are not intended to prevent flooding, they do not redirect flood waters. Wave attenuation provided by the breakwaters would help maintain beach

conditions along the Tottenville shoreline by reducing long-term beach erosion rates, reducing exposure of shoreline structures to erosion, and encouraging accretion in priority beach zones where the beach is most narrow and/or projected rates of erosion are high. The breakwaters would maintain and restore the beach while minimizing down-drift impacts. The breakwaters would attenuate waves and alter the sediment transport along the shore for this purpose. As described in Chapter 9, “Natural Resources,” of the EIS, local sediment transport rates and accretion would be altered but the natural processes would not be blocked, as there would still be sediment transport along the shore and tidal circulation around the breakwaters. Areas of increased deposition would be expected along the shoreline within the project site. The breakwaters are designed to dissipate wave energy, so an increase in suspended sediment directly adjacent to the breakwaters is not anticipated to be significant. The breakwaters have also been designed to minimize scour at the base of the structures. Flow 3D modeling of localized currents and sediment movement around individual breakwater structures completed for the project indicates the potential for scour/deposition patterns to develop at the breakwater perimeter under ebb and flood tidal flows. The scour and deposition depths are modest under normal tidal and wave conditions. There is indication of reversal of the trends between flood and ebb conditions for most areas. Scour and associated deposition around fixed structures in tidal currents typically reach quasi-equilibrium states, with some change in grain size to scour resistant diameters. The modeling results indicate that scour would be localized, within 15 feet of the ends of the breakwater.

The Shoreline Project would provide additional risk reduction from the effects of wave action and erosion, and some level of risk reduction from coastal flooding. The construction of its elements would be completed in accordance with the SWPPP and General Permit to minimize potential impacts from sediment discharge and erosion during construction. Inclusion of green infrastructure and native coastal vegetation throughout the elements of the Shoreline Project would increase infiltration of runoff from the Shoreline Project elements. The Proposed Actions would not lead to increased flooding in adjacent areas.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 15: Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.

The Proposed Actions would not result in mining, excavation, or dredging in coastal waters.

Therefore, this policy is not applicable.

Policy 16: Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.

The terrestrial portion of the study area, and the shoreline restoration area, are located within the 100-year floodplain in Zones AE and VE. Zones AE and VE are considered SFHA. Most of the south shore of Staten Island is designated as a CEHA. Consistent with the City’s Coastal Protection Initiatives and planning studies for the Tottenville area, the goal of the Layered Strategy is to reduce wave action and coastal erosion along the shoreline in Tottenville, while enhancing ecosystems and shoreline access and use. The Layered Strategy would create a structural system of living breakwaters and shoreline risk reduction measures that would attenuate wave energy, minimize shoreline erosion, and provide some level of risk reduction from coastal flooding along the shoreline, especially in the sections of beach where buildings and infrastructure are most vulnerable. The earthen berm, hybrid dune/revetment, eco-revetments, raised edge, and associated landscaping and ecological enhancements of the Shoreline Project would increase the resilience of the shoreline and augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. The Layered Strategy would result in

benefits to the public by addressing wave action, short-term and long-term erosion and coastal flooding impacts along the south shore of Staten Island.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 17: Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

See the response to Policy 16. The Proposed Actions would be consistent with this policy.

Policy 19: Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities.

The Proposed Actions would provide public access along the shoreline that is compatible with the preservation of natural resources; education regarding such preservation would be incorporated into the use of the Water Hub at either potential location. New public amenities, including a trail through each element of the Shoreline Project, would be introduced into the park that would complement existing public use of the proposed site. The Shoreline Project would provide ADA accessible access points and overlook areas along the trail to enhance physical, visual, and recreational access to the waterfront for the public. The community Water Hub would provide waterfront access (Potential Locations 1, 2, and 3) and direct seasonal access to the water for research vessels via a seasonal floating boat launch (Potential Locations 1 and 2). With Potential Locations 1 and 2 (if selected), a seasonal floating dock would also be established near the breakwater segments to provide water-based access to the breakwaters for observation, monitoring, maintenance, and stewardship, specifically including vessels operated by a non-profit organization (e.g., BOP). Potential Location 3 would utilize a “floating” Water Hub vessel instead of a floating dock for the same purposes. The floating Water Hub would be docked at existing facilities in the City (serving local groups and community members when docked locally) and would visit the project area approximately once per week from April through November for student based teaching events, and host community events approximately twice per month. For both commercial and recreational shallow draft vessels, leaving the channel is an option, and to help boaters navigating in that area, the National Oceanic and Atmospheric Administration (NOAA) issues navigation charts that are regularly updated to reflect local conditions. In the project area their Chart number 12332 (Raritan River Bay to New Brunswick) provides water depth insights. It is anticipated that the US Coast Guard will require navigation aids to provide visibility to mariners as is typically done for these structure types. The type and location of the navigation aids will be provided in accordance with federal regulations for the structure's classification. Additionally, the breakwater segments would be spaced far enough apart to avoid interference with recreational boating in Raritan Bay. Simulations have shown that there would 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.

The breakwaters would provide structural habitat for the prey of recreational fish species (e.g., summer flounder, striped bass, and bluefish), which may increase the local presence of these species in the vicinity of the breakwater segments. As a result, there may be an increase in recreational fishing in the vicinity of the breakwaters relative to current levels. However, the annual number of recreational fishing trips in Raritan Bay is not likely to increase substantially as a result of the construction of the breakwaters; rather, anglers may choose to fish near the breakwaters instead of targeting other locations. Analysis of National Marine Fisheries Service (NMFS) Marine Recreational Information Program (MRIP) survey data from 2012 to 2016 indicates that recreational charter boats were rare in Raritan Bay during that time period (NMFS 2017¹); therefore, the breakwaters would not be expected to affect the amount of charter fishing in the area.

¹ National Marine Fisheries Service (NMFS). 2017. Marine Recreational Information Program (MRIP) Survey Data. Available <http://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/downloads>.

In-water structures that provide fishing opportunities for recreational fishermen currently exist in Raritan Bay in the vicinity of the Proposed Actions. These include the Great Beds Lighthouse, over two dozen channel markers and other Aids to Navigation, at least five exposed rock piles, several submerged groins extending from the shoreline, and half a dozen other submerged obstructions on the bay bottom, as indicated by NOAA nautical charts. When using artificial reefs, recreational fishermen place high importance on the expected success rate for fishing and on previous personal experience (Milon 1989,² Polovina 1990³). Based on this, recreational fishing in Raritan Bay would likely initially continue to occur at existing structures if they have been proven to be successful, rather than moving to the breakwaters.

Recreational use of the breakwaters by anglers would likely be comparable to current use of these existing structures. Analysis of satellite images collected over 15 to 25 dates from 1995 to 2016 indicates that many of these structures, and the exposed rock piles in particular, often had boats on station in the vicinity (NYSDEC 2016⁴). When boats were present at a structure, the number of vessels ranged from one to three, but in most cases only one boat was present at a time on a given date. Aerial survey data collected over approximately 150 dates from 1995 to 2015 to quantify the number of recreational vessels on artificial reefs in Great South Bay (Kismet and Fishermen Reefs) and western Long Island Sound (Smithtown and Matinecock Reefs) indicated that the daily average number of boats observed at each of the four reefs ranged from 2 to 5 boats per day (NYSDEC 2016). Similar analysis of satellite images was conducted for an exposed rocky breakwater at the Atlantic Highlands Municipal Harbor located in Raritan Bay approximately 12 miles southeast of the proposed breakwaters. This breakwater is similar in size (4,000 feet long) and distance from shore (approximately 1,500 feet) as the proposed breakwaters. On most of the dates, there were four or fewer boats observed to be on station at the breakwater, despite the presence of the marine just inside the harbor. These results are consistent with the typical recreational use of artificial reefs and in-water structures by anglers and boaters in Raritan Bay, Great South Bay, and western Long Island Sound.

Based on these observations, a similar number of recreational boaters and anglers would be expected to use the proposed breakwaters, which would not be a substantial number of boats relative to existing recreational uses in Raritan Bay specifically, or coastal New York waters, in general. From 2012 to 2016, fishermen made a total of 630 recreational fishing trips in Raritan Bay, averaging 126 trips per year (NMFS 2017). Conservatively assuming that all 126 recreational fishing trips per year in Raritan Bay would target the breakwaters, this would be equivalent to 4 to 6 trips per week over a 6-month period, which likely represents the prime fishing season in Raritan Bay. If these trips occur primarily over the weekend (Friday through Sunday), the breakwaters would see an average of up to 2 boats per day, which is within the range of daily average boat counts at other nearshore reefs and other existing in-water structures.

Recreational access to Raritan Bay for swimmers and kayakers is limited along the south shore of Staten Island where the breakwaters would be located. While kayakers may reach the breakwaters from access points along the shoreline outside the project area, recreational use by swimmers is not likely. Conference House Park does not have a swimming beach. The nearest swimming beach is Wolfe's Pond Park, which is over two miles away by water. In accordance with NYC

² Milon, J.W. 1989. Artificial marine habitat characteristics and participation behavior by sport anglers and divers. *Bulletin of Marine Science* 44: 853-862.

³ Polovina, J.J. 1990. A global perspective on artificial reefs and fish aggregating devices. In: Pietersz, V.L.C. *Symposium on Artificial Reefs and Fish Aggregating Devices as Tools for the Management and Enhancement of Marine Fishery Resources*, 14-17 May 1990, Sri Lanka. Regional Office for Asia and the Pacific, United Nations Food and Agriculture Organization, Bangkok, pp. 251-257.

⁴ New York State Department of Environmental Conservation (NYSDEC). 2016. Artificial Reef Aerial Survey Boat Count: Beginning 1995. Dataset updated December 22, 2016. Available <https://data.ny.gov/Recreation/Artificial-Reef-Aerial-Survey-Boat-Count-Beginning/e6z5-r6zp>.

Parks rules and regulations,⁵ kayakers and canoers accessing Raritan Bay from Conference House Park are prohibited from swimming and scuba diving in Raritan Bay.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 20: Access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned shall be provided and it shall be provided in a manner compatible with adjoining uses.

See the response to Policy 19. The Proposed Actions would be consistent with this policy.

Policy 21: Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water-related uses along the coast.

See the response to Policy 19. The Proposed Actions would be consistent with this policy.

Policy 22: Development, when located adjacent to the shore, will provide for water-related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.

See the response to Policy 19. The Proposed Actions would be consistent with this policy.

Policy 23: Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archaeology or culture of the state, its communities, or the nation.

The Proposed Actions would affect an area at the southeastern end of Staten Island, as described in Chapter 5, “Historic and Cultural Resources,” of the EIS, and may involve work in or in the immediate vicinity known historic architectural resources, including resources within Conference House Park, which has played an important role in prehistory and in colonial/early-American history. In compliance with Section 106 of the National Historic Preservation Act, the Proposed Actions would include measures to avoid, minimize, or mitigate adverse effects on historic and cultural resources—including both architectural and archaeological resources—developed in consultation with New York State Historic Preservation Office (SHPO), LPC, and Tribal Nations representing Richmond County. Compliance under Section 106 fulfills the requirements of Section 14.09 of the New York State Historic Preservation Act.

ARCHITECTURAL RESOURCES

As described in Chapter 5, “Historic and Cultural Resources,” of the EIS, Conference House Park contains known historic architectural resources—the Conference House/Christopher Billopp House (National Historic Landmark [“NHL”], listed on the State and National Registers of Historic Places [“S/NR”], and a designated New York City Landmark [“NYCL”]), the Henry Hogg Biddle House (S/NR-eligible), the Sam and Hannah Wood House⁶ (appears S/NR-eligible, per LPC comment letter dated November 9, 2016), and the Rutan-Beckett House (S/NR-eligible).⁷ Located just outside Conference House Park is the James M. Rutan House (S/NR-eligible), which is located across Satterlee Street from the park. The Prince’s Bay Lighthouse, near the northern limits of the project area, is S/NR-eligible and is a NYCL.

Two architectural resources, the Henry Hogg Biddle House and the Rutan-Beckett House, are being considered for Water Hub Potential Location 2. If Water Hub Potential Location 2 is selected, one of these two historic architectural resources would be rehabilitated and adaptively used. If plans move forward to locate the programming for the Water Hub at one of these two buildings, consultation with the consulting parties would continue to be undertaken pursuant to

⁵ <https://www.nycgovparks.org/rules/section-2-06>

⁶ The Sam and Hannah Wood House appears in CRIS and on a 1986 Building-Structure Inventory Form in CRIS as the “Sam and Hannah Woods House.” However, the Conference House Park web site and brochure identifies the building as the Sam and Hannah Wood House (without the “s”).

⁷ Since the issuance of the DEIS, in a comment letter dated March 27, 2017, SHPO determined that the Henry Hogg Biddle House, the Sam and Hannah Wood House, and the Rutan-Beckett House are S/NR-eligible.

the terms outlined in the Programmatic Agreement executed in May 2013 among the Federal Emergency Management Agency (FEMA), SHPO, the New York State Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and ACHP and specifically pursuant to Appendix D to the Programmatic Agreement, which pertains to the CDBG-DR program for activities in New York City.

Since the DEIS was issued, in comments dated March 27, 2017, SHPO determined that the Henry Hogg Biddle House and the Rutan-Beckett House are both S/NR-eligible. Should either the Biddle House Option or the Rutan-Beckett House Option for the Water Hub Potential Location 2 be selected, consultation with SHPO would be undertaken regarding any proposed alterations to the historic resource. In addition, because the Biddle House is a NYCL, if the Biddle House Option is selected for the Water Hub, NYC Parks would consult with the New York City LPC under the New York City Landmarks Preservation Law regarding any proposed alterations to this NYCL. LPC would review the proposed alterations and, upon approval, would issue a Binding Commission Report summarizing LPC's findings. As the anticipated alterations to either building would be limited to rehabilitation and adaptive reuse changes, no adverse effects are anticipated.

ARCHAEOLOGICAL RESOURCES

Conference House Park contains the Ward's Point Archaeological Conservation Area, an archaeological historic district that is a NHL and is listed on the S/NR. Pursuant to Section 106 of the NHPA, a Phase 1A Archaeological Documentary Study ("Phase 1A Study") for the Breakwaters, Shoreline, and Water Hub Potential Location 2 areas of potential effect (APEs) was prepared in May 2017.⁸ The study documented the development history of the APEs as well as their potential to yield archaeological resources, including both precontact and historic archaeological resources. In addition, the Phase 1A study documented the current conditions of the APEs and summarized previous cultural resource investigations, which have been undertaken in the vicinity.

The Phase 1A study concluded that it is not likely that intact archaeological deposits would be located within the sandy beaches of the Shoreline APE. However, limited portions of the upland areas were determined to possess moderate sensitivity for precontact archaeological resources and moderate sensitivity for historic period archaeological resources. In addition, upland areas of the Water Hub Potential Location 2 APE was determined to be highly sensitive for precontact and historic period archaeological resources and two areas within the steeply sloped bluffs were also determined to have sensitivity for historic period archaeological resources. A Phase 1B archaeological investigation was recommended for those areas of archaeological sensitivity within the Shoreline or Water Hub Potential Location 2 APE that would be impacted by the proposed project. The Breakwaters APE, which is located entirely within the Raritan Bay, was determined to have no sensitivity for archaeological resources dating to the historic period and low to moderate sensitivity for precontact archaeological resources at depths between 25 and 35 feet below the bay floor. As such, the proposed project would not result in impacts to archaeologically sensitive depths and no additional archaeological analysis was recommended for the Breakwaters APE.

All Phase 1B testing within the previously identified areas of archaeological sensitivity or any new areas of archaeological sensitivity that may be identified in the newly added portion of the Shoreline APE would be completed in consultation with SHPO, LPC, and the Tribal Nations. Any additional archaeological investigation or consultation with the consulting parties would be completed pursuant to the terms outlined in the Programmatic Agreement executed in May 2013 among the Federal Emergency Management Agency (FEMA), SHPO, the New York State Office

⁸ AKRF, Inc. (2016): "Phase 1A Archaeological Documentary Study: Coastal and Social Resiliency Initiatives for the Tottenville Shoreline: Living Breakwaters and Tottenville Shoreline Protection Projects; Staten Island, Richmond County, New York." Prepared for: the Governor's Office of Storm Recovery; New York, NY.

of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and ACHP and specifically pursuant to Appendix D to the Programmatic Agreement, which pertains to the CDBG-DR program for activities in New York City. Any additional archaeological investigations completed subsequent to the Phase 1B investigation (e.g., a Phase 2 archaeological survey or Phase 3 Data Recovery) would be completed prior to construction in consultation with SHPO, LPC, and the Tribal Nations.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 25: Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.

An urban design and visual resources analysis was prepared in accordance with *City Environmental Quality Review (CEQR) Technical Manual* methodologies and in compliance with NYSDEC *Assessing and Mitigating Visual Impacts* policy memorandum (DEP-00-2 issued 7/31/00) on assessing impacts on urban design and visual and aesthetic resources, and developing mitigation as appropriate. The analysis, presented in Chapter 6, “Urban Design and Visual Resources,” of the EIS, provides a description of existing urban design characteristics, visual and aesthetic resources, and views and viewsheds within the project area. In accordance with NYSDEC guidance, aesthetic and visual resources were identified, including Conference House Park and historic structures within the park and study area, and views toward the waterfront and Raritan Bay. Views from the areas of the Proposed Actions would include the in-water breakwater components, however, they would be located in Raritan Bay at a distance from the shoreline and are being designed to be low in scale. Because of distance and the low, linear scale of the breakwaters, and the common color and reflectance (lack of contrast) of the breakwaters to land forms in the distance, the visibility of the breakwaters would be similar to existing views of land masses that can be seen from many on-shore vantage points toward Raritan Bay. The Proposed Actions would complement the scenic character of natural resources along the shoreline, increase physical and visual access to the water’s edge, and increase community stewardship of on-shore and in-water ecosystems. The earthen berm would be located in a densely wooded area and would not adversely affect scenic quality in the area. The hybrid dune/revetment system would be slightly taller than the existing temporary dune that it would replace, however, this would result in minimal changes to these views from nearby vantage points and the scenic quality of the coastal area. The Water Hub or small storage facility at Potential Location 1 would be designed to be contextual to the surrounding area and buildings in terms of scale, siting, and materials. The Water Hub at Potential Location 2 would be within an existing building and would not result in any change to scenic resources. The “floating” Water Hub at Potential Location 3 would visit the project area periodically, approximately once per week during April through November be intermittently present and would not disrupt scenic resources. The visual quality of the shoreline would be enhanced through the establishment of native coastal vegetation throughout the project elements.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 28: Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.

No ice management activities would be conducted as part of the Proposed Actions. Therefore, this policy is not applicable.

Policy 30: Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.

The Proposed Actions would not result in municipal, industrial, or commercial discharge of pollutants into coastal waters. Stormwater discharges during construction would be in accordance with a SWPPP developed as required by the General Permit.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 32: Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.

As described previously, only one of three potential locations will be selected for the proposed Water Hub. Currently, based on information from NYCDEP, there is no sanitary sewage infrastructure in the area of the proposed Water Hub at Potential Location 1, although such conveyance is planned as per New York City Department of Environmental Protection (NYCDEP) Drainage Plans. Should a sanitary sewer not be available to receive sanitary waste from the proposed Water Hub at Potential Location 1 (if selected), similar to other areas within the study area, sanitary waste would be discharged to a septic system designed in accordance with NYSDEC and New York State Department of Health (NYSDOH) requirements and standards. The Water Hub at Potential Location 2 would be within an existing NYC Parks structure that discharges to a septic system. The floating Water Hub at Potential Location 3 would not include a sanitary waste system.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 35: Dredging in coastal waters and disposal of dredged material will be undertaken in a manner that meets existing State permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.

No dredging would occur as a result of the Proposed Actions. The Breakwaters Project would convert approximately 11.4 acres of existing sand/gravel substrate and overlying open water habitat to complex hard structure. The loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW would result in adverse impacts to aquatic resources and would be mitigated pursuant to the Clean Water Act through measures that may include available credits from an approved mitigation bank, and restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York. As described in Chapter 9, “Natural Resources,” of the EIS, the breakwaters would be constructed in a manner that minimizes the potential for resuspension of bottom sediment in accordance with state and federal permits, including timing restrictions for in-water activities and would be conducted in accordance with permits issued by the NYSDEC and the USACE and the permitting conditions that protect water quality, aquatic biota, and wetlands. Geotextile fabric would be prefabricated offsite in large panels and spooled onto a roller that may be floated to the installation location. Sheets would be cut to the required length and lowered to the bottom using temporary framing or pinning and held in place permanently using rocks for the breakwater construction. The rock would be placed on the geotextile in a manner that limits sediment resuspension; these materials would be “clean” to further minimize the potential for release of suspended sediment. Construction vessels would maintain at least 2 feet of clearance from the bottom during all tide phases, to minimize sediment resuspension caused by their movement. Sediment disturbing activities would not impact the listed resources. Placement of 11,637 cubic yards of sand within a 3.1-acre area that would result in a net loss of 2.6 acres below MHW is intended to reduce erosion and augment the accretion potential provided by the breakwaters in targeted sections of the shoreline. This shoreline restoration would be completed outside the spawning period for horseshoe crab and winter flounder⁹ and would not adversely affect these resources.

Therefore, the Proposed Actions would be consistent with this policy.

⁹ In compliance with NMFS recommendations, in-water construction activities would be restricted from April 15 through July 15 for the protection of horseshoe crabs, and from January 1 through May 31 for the protection of winter flounder.

Policy 37: Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.

The landscaped areas within the Shoreline Project and at the Water Hub at Potential Locations 1 and 2 would be maintained using Integrated Pest Management (IPM) techniques, thereby substantially diminishing the need for the use of pesticides and other chemicals and minimizing adverse effects to coastal waters. The implementation of erosion and sediment controls during construction in accordance with the New York State Erosion and Sediment Control Standards, and integration of stormwater management measures post-construction in accordance with the SWPPP and General Permit would minimize the discharge of soil into Raritan Bay as a result of the proposed shoreline improvement activities. With these measures in place, stormwater discharges from the Water Hub and Shoreline Project would not have the potential to result in significant adverse impacts to coastal waters. No discharge would be associated with the Breakwaters Project.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 38: The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.

Neither surface waters nor groundwater are used for potable water supply in the area, and the Proposed Actions would not result in surface or groundwater withdrawal. Drinking water for Staten Island is provided by New York City's system of upstate reservoirs.

Any groundwater recovered during dewatering would be tested and treated prior to discharge in accordance with NYSDEC requirements. Excavation of soils to construct the on-shore components of the Proposed Actions would not have the potential to adversely affect groundwater due to soil contamination, as described in Chapter 9, "Natural Resources," of the EIS. Sampling of the southernmost portion of the unpermitted fill within a portion of the shoreline indicated that these samples met the NYSDEC Soil Cleanup Objectives (SCOs) for residential use and for protection of groundwater, with the exception of acetone in some of the samples, which exceeded the protection of groundwater SCO, but which is a typical laboratory contaminant and thus may have not actually been present in the samples. In addition to this exceedance, there were also exceedances of the more restrictive "Unrestricted SCOs" for the metals lead and nickel, and for the pesticide DDT and its metabolites DDE and DDD. As such, the removal of this material (and, assuming testing of the remaining soil indicates similar findings, the remaining soil to be removed from within the Surf Avenue right-of-way) would not have the potential to adversely affect groundwater. Green infrastructure measures incorporated into the Shoreline Project and the proposed on-shore Water Hub components of the Breakwaters Project would allow runoff from these project elements to infiltrate into the soil and recharge to groundwater. The landscaped areas within the Shoreline Project and at the on-shore Water Hub (if selected) would be maintained using IPM techniques thereby substantially diminishing the need for the use of pesticides and other chemicals and minimizing adverse effects to groundwater quality. Therefore, the Proposed Actions would not result in significant adverse impacts to groundwater. With the implementation of a SWPPP as required by the General Permit, construction and operation of the Water Hub and Shoreline Project would not have the potential to adversely affect streams or other sources of water to existing wetlands.

Therefore, the Proposed Actions are consistent with this policy.

Policy 40: Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.

The Proposed Actions would not result in the establishment of electric generating capacity or industrial facilities. Therefore, this policy is not applicable to the Proposed Actions.

Policy 41: Land use or development in the coastal area will not cause national or state air quality standards to be violated.

NEPA requires an assessment of potential impacts on air quality to demonstrate compliance with the Clean Air Act (CAA), including State Implementation Plans (SIPs). The air quality analysis follows guidance from the United States Environmental Protection Agency and the *CEQR Technical Manual*. The analysis considers the potential impacts and benefits of the Proposed Actions on air quality and examine whether the Proposed Actions could result in any new exceedances of or any exacerbation in any existing exceedances of National Ambient Air Quality Standards (NAAQS).

As described in Chapter 13, “Air Quality,” of the EIS, the Proposed Actions would generate emissions from both direct and indirect sources. Direct sources of emissions would primarily be from natural gas and/or oil fired heating, ventilation, and air condition systems (HVAC) associated with the on-shore Water Hub at either Potential Location 1 or 2. The floating Water Hub at Potential Location 3 would not involve a permanent on-shore facility nor is it expected to contribute significantly to the air quality concentrations in the vicinity of the existing facilities from which the vessel would be docked. Potential indirect air quality impacts of the Proposed Actions would stem from increases in vehicular traffic. However, there is no potential for mobile-source impacts from the Proposed Actions, as they are not expected to significantly alter traffic conditions. Initial screening level analyses were performed to evaluate the potential for adverse air quality impacts from the Water Hub’s HVAC system. An AERSCREEN Analysis indicated that the maximum modeled pollutant concentrations (nitrogen dioxide, sulfur dioxide, and fine particulate matter) would be well below background levels and lower than their respective thresholds (i.e., NAAQS and *de minimis* criteria), and there would be no potential for significant air quality impacts from the Water Hub. Similarly, the maximum predicted levels of carbon monoxide and fine particulate matter associated with the projected parking demand would be in compliance with the applicable criteria, and there would be no potential for significant adverse impacts on air quality from the proposed parking lot.

Therefore, the Proposed Actions would be consistent with this policy.

Policy 43: Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors: nitrates and sulfates.

See the response to Policy 41. The Proposed Actions would be consistent with this policy.

Policy 44: Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

The goals of the Proposed Actions are in concert with the goal of protecting and restoring tidal and freshwater wetlands. The Layered Strategy would include risk reduction from wave energy, coastal erosion, and coastal flooding, enhance ecosystems along the coast, and foster stewardship and community education. Each action would help to protect the tidal wetlands present within the study area. As discussed in Chapter 9, “Natural Resources,” of the EIS, construction of the breakwaters would result in temporary and permanent impacts to NYSDEC littoral zone tidal wetlands and mapped NWI estuarine wetlands in the vicinity of the breakwater segments due to sediment resuspension during construction of the breakwater segments. Increases in suspended sediment would be temporary, localized, and would dissipate upon cessation of sediment disturbing activities. There would be a net loss of 7.1 acres of NYSDEC littoral zone tidal wetlands located in water depths of 6 feet or less at MLW within the footprint of the Type A and Type B breakwater segments, and about 2.6 acres within the portion of the shoreline restoration below MHW, for a total loss of NYSDEC littoral zone tidal wetlands of 9.7 acres. Loss of NYSDEC littoral zone wetlands within the footprint of the breakwater segments would be small in comparison to the amount of unaffected NYSDEC littoral zone tidal wetlands within Raritan Bay and would not result in significant adverse impacts to the NYSDEC littoral zone wetland resources.

The breakwater alignment, segment length, and distance from the shore were designed to promote beach accretion, but avoid the creation of tombolos, or sand spits connecting the shore and breakwater created through deposition, which would act like a terminal groin extending into the water from the beach and encroaching on littoral zone wetlands. This was tested in shoreline modeling for various breakwater alignments; the layout of the breakwaters would result in containment of greater amounts of sediment and stabilization of the shoreline throughout the system, thereby avoiding the development of tombolos and additional loss of littoral zone tidal wetlands.

The eco-revetment between Brighton Street and Manhattan Street would be constructed within the northern limit of the 0.8-acre delineated tidal wetland. An approximately 630 square-foot section of the hybrid dune/revetment would also be constructed in this wetland at its eastern limit. In total, approximately 6,270 square feet (0.14 acres) of this wetland would be impacted. An existing sand bridge comprising unpermitted fill (approximately 595 square feet and 44 CY) that runs north to south currently divides the delineated wetland and would be removed in order to construct the eco-revetment. The removal of this sand bridge would remove an impediment to tidal exchange within the eastern portion of the wetland, and result in a net change in fill within the wetland of approximately 5,675 square feet (0.13 acres), and 1,176 CY. Permanent impacts to the tidal wetland would be primarily within the portion of the wetland dominated by common reed and would be offset by the enhancement of the tidal wetland plant community that would include improved tidal exchange through modification of the inlet to Raritan Bay. Phragmites would be removed from the wetland, and native saltmarsh plants would be re-established through seeding or planting plugs to supplement the native saltmarsh vegetation that already occurs in the wetland. The existing native saltmarsh vegetation would be retained to the extent possible, and individual plants and seeds would be collected for preservation and replanting within the wetland as part of the enhancement. Currently, there is limited connectivity between this wetland and the open waters of Raritan Bay due to sand clogging the outlet structure to the wetland and the presence of the temporary dunes. The Proposed Actions would increase tidal exchange between the wetland and Raritan Bay, allowing access for fish that may move through the Bay and connected waters; the Proposed Actions would also remove the sand bridge, which impedes tidal exchange with the eastern portion of this wetland. These enhancements may also improve foraging habitat for waterbirds that occur in the wetlands. Temporary impacts would be minimized through the use of marsh mats or low ground-pressure equipment within the wetland and installation of erosion and sediment control measures throughout the construction area in accordance with a SWPPP prepared under the General Permit. Portions of the wetland disturbed during dune and eco-revetment construction would be restored as necessary (e.g., repair of ruts, stabilization of soil). Wetland vegetation would be planted to replace vegetation temporarily disturbed during construction. With these measures in place, temporary impacts to wetlands during construction and the permanent loss of a small portion of the wetland due to the eco-revetment and hybrid dune/revetment would not result in significant adverse impacts to wetland resources.

Other elements of the shoreline component of the Proposed Actions would be built within the NYSDEC-regulated tidal wetlands adjacent area (TWAA) (i.e., the hybrid dune/revetment, the eco-revetment along Surf Avenue that would extend to approximately Sprague Avenue, raised edge, the parking lot for the Water Hub at Potential Location 1, and the small facility near the terminus of Page Avenue that would be developed at Water Hub Potential Location 1 should the Water Hub program be sited at Potential Locations 2 or 3). Within the TWAA outside the shoreline restoration area, erosion and sediment control measures (e.g., silt fencing and hay bales) would be implemented in accordance with a SWPPP prepared for the project as required by the SPDES General Permit and would minimize discharges of sediment during construction and avoid adverse effects to wetlands. The hybrid dune/revetment would enhance the function of the TWAA in protecting NYSDEC littoral zone tidal wetlands within Raritan Bay by stabilizing the shoreline. In addition to stabilizing the shoreline using a gradual riprap slope designed to minimize erosion of the beach at the toe of the structure, the raised edge

would include stormwater management measures, such as bioswales, to maintain the protective function of the TWAA. While the walkways would be impermeable, stormwater management measures like bioswales would be installed adjacent to the eco-revetments and raised edge to allow treatment of runoff from these project elements, and the planted portions of the revetment would allow additional infiltration. The landscaping with native coastal species of the hybrid dune/revetment, eco-revetment, and raised edge would also enhance the native coastal habitats available within the TWAA. The parking area for the Water Hub at Potential Location 1 would be designed as a pervious surface and would be designed to manage any net runoff generated by the parking area. The seasonal deployment of the floating boat launch (for Potential Locations 1 and 2) would occupy a small portion of the TWAA and would not adversely affect this resource. The Proposed Actions would minimize the introduction of impervious surfaces within the NYSDEC TWAA, would stabilize the shoreline while minimizing the potential for erosion of the beach, would enhance the habitats through the establishment of native dune vegetation and other native coastal plant species throughout the Shoreline Project, and would not adversely affect the function of the TWAA to protect NYSDEC littoral zone tidal wetlands.

Therefore, the Proposed Actions would be consistent with this policy.

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Coastal Assessment Form

A. INSTRUCTIONS (Please print or type all answers)

1. State agencies shall complete this CAF for proposed actions which are subject to Part 600 of Title 19 of the NYCRR. This assessment is intended to supplement other information used by a state agency in making a determination of significance pursuant to the State Environmental Quality Review Act (see 6 NYCRR, Part 617). If it is determined that a proposed action will not have a significant effect on the environment, this assessment is intended to assist a state agency in complying with the certification requirements of 19 NYCRR Section 600.4.
2. If any question in Section C on this form is answered “yes,” then the proposed action may affect the achievement of the coastal policies contained in Article 42 of the Executive Law. Thus, the action should be analyzed in more detail and, if necessary, modified prior to either (a) making a certification of consistency pursuant to 19 NYCRR Part 600 or, (b) making the findings required under SEQR, 6 NYCRR, Section 617.11, if the action is one for which an environmental impact statement is being prepared. If an action cannot be certified as consistent with the coastal policies, it shall not be undertaken.
3. Before answering the questions in Section C, the preparer of this form should review the coastal policies contained in 19 NYCRR Section 600.5. A proposed action should be evaluated as to its significant beneficial and adverse effects upon the coastal area.

B. DESCRIPTION OF PROPOSED ACTION

1. Type of state agency action (check appropriate response):

- (a) Directly undertaken (e.g. capital construction, planning activity, agency regulation, land transaction)
- (b) Financial assistance (e.g. grant, loan, subsidy)
- (c) Permit, license, certification

2. Describe nature and extent of action:

The Proposed Actions comprise implementation of resiliency initiatives intended to work in tandem to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of Staten Island, NY. These initiatives include the Living Breakwaters Project (Breakwaters Project) and Tottenville Shoreline Protection Project (Shoreline Project). The Breakwaters Project would consist of ecologically enhanced breakwater segments occupying approximately 11.4 acres of sand/gravel habitat in Raritan Bay located between 790 and 1,170 feet offshore in waters approximately 2 to 10 feet deep at mean low water. Additionally, the vast majority of the breakwater structures would be located more than 1,700 feet from the Federal Navigation Channel with the closest breakwater segment located more than 700 feet from the channel. The Breakwaters Project would reduce wave energy at the shoreline; reduce/reverse shoreline erosion; increase habitat diversity through provision of complex subtidal, intertidal, and emergent rocky structure elements; and promote social resilience through educational and community programs proposed at a Water Hub. There are three potential locations being evaluated for siting the Water Hub, only one of which would be selected: Potential Location 1 would be near the southern terminus of Page Avenue and would involve construction of a new structure. Water Hub Potential Location 2 would involve the rehabilitation and adaptive reuse of an existing NYC Parks structure in the northwestern portion of Conference House Park. Potential Location 3 would comprise a floating Water Hub—a vessel operated by a non-profit organization that would visit the breakwater project area for education and monitoring and would be docked at existing facilities in the City. The Shoreline Project would provide on-shore risk reduction measures that would augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. It includes a series of shoreline risk-reduction measures along the Tottenville shoreline largely within New York City Department of Parks and Recreation (NYC Parks) Conference House Park from approximately west of the intersection of Swinnerton Street and Billop Avenue to Page Avenue, including: an earthen berm, two eco-revetments, hybrid dune/revetment system, and raised edge (revetment with trail), along with wetland enhancement and landscaping with coastal vegetation. Three Americans with Disabilities Act (ADA) compliant access points and overlooks would be constructed along the shoreline protection system.

Portions of the Breakwaters Project and Shoreline Project would be located within the 100-year floodplain and New York State Coastal Erosion Hazard Area.

3. Location of action:

Richmond

County

Tottenville

City, Town or Village

South Shore

Street or Site Description

4. If an application for the proposed action has been filed with the state agency, the following information shall be provided:

(a) Name of applicant:

Daniel Greene, Governor's Office of Storm Recovery

(b) Mailing address:

25 Beaver Street, New York, NY 10004

(c) Telephone Number: Area Code

(212) 480-4644

(d) State agency application number:

5. Will the action be directly undertaken, require funding, or approval by a federal agency?

Yes

No

If yes, which federal agency?

US Department of Housing and
Urban Development CDBG-DR
Program

C. COASTAL ASSESSMENT (Check either "YES" or "NO" for each of the following questions)

	<u>YES</u>	<u>NO</u>
1. Will the proposed activity be <u>located</u> in, or contiguous to, or have a <u>significant effect</u> upon any of the resource areas identified on the coastal area map:		
(a) Significant fish or wildlife habitats?	_____	_____ <u>X</u>
(b) Scenic resources of statewide significance?	_____	_____ <u>X</u>
(c) Important agricultural lands?	_____	_____ <u>X</u>
2. Will the proposed activity have a <u>significant effect</u> upon:		
(a) Commercial or recreational use of fish and wildlife resources?	_____	_____ <u>X</u>
(b) Scenic quality of the coastal environment?	_____	_____ <u>X</u>
(c) Development of future, or existing water dependent uses?	_____	_____ <u>X</u>
(d) Operation of the State's major ports?	_____	_____ <u>X</u>
(e) Land and water uses within the State's small harbors?	_____	_____ <u>X</u>
(f) Existing or potential public recreation opportunities?	_____	_____ <u>X</u>
(g) Structures, sites or districts of historic, archeological or cultural significance to the State or nation?	_____	_____ <u>X</u>
3. Will the proposed activity <u>involve</u> or <u>result in</u> any of the following:		
(a) Physical alteration of two (2) acres or more of land along the shoreline, land under water or coastal waters?	_____ <u>X</u>	_____
(b) Physical alteration of five (5) acres or more of land located elsewhere in the coastal area?	_____	_____ <u>X</u>
(c) Expansion of existing public services of infrastructure in undeveloped or low density areas of the coastal area?	_____	_____ <u>X</u>
(d) Energy facility not subject to Article VII or VIII of the Public Service Law?	_____	_____ <u>X</u>
(e) Mining, excavation, filling or dredging in coastal waters?	_____ <u>X</u>	_____
(f) Reduction of existing or potential public access to or along the shore?	_____	_____ <u>X</u>
(g) Sale or change in use of state-owned lands located on the shoreline or under water?	_____	_____ <u>X</u>
(h) Development within a designated flood or erosion hazard area?	_____ <u>X</u>	_____
(i) Development on a beach, dune, barrier island or other natural feature that provides protection against flooding or erosion?	_____ <u>X</u>	_____
4. Will the proposed action be <u>located</u> in or have a <u>significant effect</u> upon an area included in an approved Local Waterfront Revitalization Program?	_____ <u>X</u>	_____

D. SUBMISSION REQUIREMENTS

If any question in Section C is answered "Yes", AND either of the following two conditions is met:

Section B.1(a) or B.1(b) is checked; or
Section B.1(c) is checked AND B.5 is answered "Yes",

THEN one copy of the Completed Coastal Assessment Form shall be submitted to:

New York State Department of State
Office of Coastal, Local Government and Community Sustainability
One Commerce Plaza
99 Washington Avenue, Suite 1010
Albany, New York 12231-0001

If assistance of further information is needed to complete this form, please call the Department of State at (518) 474-6000.

E. REMARKS OR ADDITIONAL INFORMATION

2. Will the proposed activity have a significant effect upon:

(f) Existing or potential public recreation activities? [Policies 9, 19, 20, 21, 22]

The proposed community Water Hub at Potential Locations 1 or 2 (if selected) would include an approximately 210-foot-long by 8-foot wide accessory seasonal boat launch would extend from about 1 foot above MHW to water depths sufficient for docking of a shallow draft research vessel in water depths between 4 and 5 feet at MLW. Also at Potential Locations 1 or 2, a temporary seasonal floating dock measuring about 30 feet by 50 feet, with a total area of 1,500 square feet, would be installed near the breakwaters segments for observations, monitoring, maintenance and stewardship, including specifically, for vessels operated a non-profit organization (e.g., BOP). The seasonal boat launch and floating dock would not impede use of recreational fish and wildlife resources or lead to over-use of these resources. The floating Water Hub at Potential Location 3 (if selected) would be docked at existing facilities in the City (serving local groups and community members when docked locally) and would visit the project area approximately once per week from April through November for student based teaching events, and host community events approximately twice per month. The intermittent presence of this vessel would not interfere with recreational uses of Raritan Bay. The Proposed Actions would provide enhanced public access to the waterfront and adjacent shoreline areas via a continuous trail with periodic placement of ADA accessible trails, access points and overlooks. The Water Hub (at any of the three potential locations) and shoreline improvements would enhance recreational activities on the water and in waterfront-adjacent areas. For both commercial and recreational shallow draft vessels, leaving the channel is an option and to help boaters navigating in that area the National Oceanic and Atmospheric Administration (NOAA) issues navigation charts that are regularly updated to reflect local conditions. In the project area their Chart number 12332 (Raritan River Bay to New Brunswick) provides water depth insights. It is anticipated that the US Coast Guard will require navigation aids to provide visibility to mariners as is typically done for these structure types. The type and location of the navigation aids will be provided in accordance with federal regulations for the structure's classification. Additionally, the breakwater segments would be spaced far enough apart to avoid interference with recreational boating in Raritan Bay. In-water structures that provide fishing opportunities for recreational fishermen currently exist in Raritan Bay in the vicinity of the Proposed Actions. Recreational use of the breakwaters by anglers would likely be comparable to current use of these existing structures (2 to 5 boats per day observed at artificial reefs in New York waters). Kayakers and canoers may reach the breakwaters from access points along the shoreline outside the project area, but recreational access for these types of vessels is limited along the south shore of Staten Island where the breakwaters would be located, and significant increases in recreational boating are not anticipated. Similar to behavior observed in other areas of Staten Island, seals may be attracted to the proposed breakwaters. Therefore, the Proposed Actions are consistent with Policies 9, 19, 20, 21, and 22.

3. Will the proposed activity involve or result in any of the following:

(a) Physical alteration of two (2) acres or more of land along the shoreline, land under water or coastal waters? [Policies 2, 11, 12, 20, 28, 35, 44]

The Breakwaters Project would include placement of 9 ecologically enhanced breakwater segments occupying a footprint of approximately 11.4 acres of sand/gravel habitat located between 790 and 1,170 feet offshore from the Tottenville shoreline in waters approximately 2 to 10 feet deep at mean low water. The breakwaters would convert 11.4 acres of sand/gravel habitat to complex rocky and eco-enhanced breakwaters that would create habitat diversity for fish and shellfish. The Breakwaters Project would also include about 17,404 cubic yards of shoreline restoration over 3.1 acres of beach between Manhattan Street and Loretto Street as part of beach restoration activities; 11,637 cubic yards would occupy 2.6 acres below mean high water (MHW). The Water Hub at Potential Location 1 would comprise an approximately 5,000-square-foot (0.11-acre) building and approximately 35,500 square feet (0.81 acres) of site improvements (e.g., landscaping, parking, and utility spaces for New York City Department of Parks and Recreation [NYC Parks] vehicles and equipment). The Water Hub at Potential Location 2 would be within an existing NYC Parks structure, would use existing parking space, and would only result in physical alteration of land for the installation of an ADA accessible ramp to the water access. A 1,500-square-foot (0.03-acre) floating dock would be deployed for seasonal use near the middle section of breakwaters, and a floating boat launch would be seasonally deployed as part of the Water Hub facility at either potential location for use by research vessels (Potential Locations 1 and 2 only). Wayfinding and interpretive elements and a small storage facility for kayaks (e.g., small pavilion, shed, or other light structure) would be constructed near the terminus of Page Avenue (Potential Locations 2 and 3 only). The Shoreline Project would include a 948 linear foot earthen berm comprising 0.5 acres, a 338 linear foot eco-revetment between Brighton Street and Manhattan Street, a 937 linear foot hybrid dune/revetment system, a 396-foot eco-revetment between Loretto Street and Sprague Avenue comprising 0.6 acres, and a 2,536-foot raised edge (revetment and trail) comprising 5.3 acres; in total, the Shoreline Project would cover approximately 6.4 acres. The Proposed Actions would improve resilience of the

shoreline, improve habitat diversity for aquatic biota, minimize impacts to and enhance tidal wetlands, provide improved access to the waterfront, and would not require ice management. Therefore, the Proposed Actions are consistent with Policies 2, 11, 12, 20, 28, 35, and 44.

(e) Mining, excavation, filling or dredging in coastal waters? [Policies 15, 35]

No mining, excavation, or dredging would occur as a result of the Proposed Actions. The Breakwaters Project would result in the conversion of 11.4 acres of sand/gravel and overlying open water habitat to diverse rocky surface. The loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW would result in adverse impacts to aquatic resources and would be mitigated pursuant to the Clean Water Act through measures that may include available credits from an approved mitigation bank, and restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York. Construction of the breakwaters would be conducted in a manner that would minimize sediment resuspension and potential temporary effects to water quality, and construction would adhere to state and federal permits, including timing restrictions for in-water activities and would be conducted in accordance with permits issued by the NYSDEC and USACE and the permitting conditions that protect water quality, aquatic biota, and wetlands. Geotextile fabric would be prefabricated offsite in large panels and spooled onto a roller that may be floated to the installation location. Sheets would be cut to the required length and lowered to the bottom using temporary framing or pinning and held in place permanently using rocks for the breakwater construction. The rock would be placed on the geotextile in a manner that limits sediment resuspension; these materials would be “clean” to further minimize the potential for release of suspended sediment. Construction vessels would maintain at least 2 feet of clearance from the bottom during all tide phases, or work only at tide levels sufficient to keep the barges off the Bay bottom, to minimize sediment resuspension caused by their movement. Placement of 11,637 cubic yards of sand for shoreline restoration would occupy 2.6 acres below MHW. The shoreline restoration is intended to reduce erosion and augment the accretion potential of the breakwaters in targeted sections of the shoreline. It would be completed outside of the spawning period for horseshoe crab and winter flounder and would not adversely affect coastal waters. Therefore, the Proposed Actions are consistent with Policies 15 and 35.

(h) Development within a designated flood or erosion hazard area? [Policies 11, 12, 17]

The Proposed Actions would be within existing open space located fully within the 100-year floodplain in Zones AE and VE. Zones VE and AE are considered Special Flood Hazard Areas (SFHA). Most of the south shore of Staten Island falls within state-designated Coastal Erosion Hazard Area. The Proposed Actions would create a structural system of living breakwaters and shoreline risk reduction measures that would attenuate wave action, minimize shoreline erosion, and address the impacts of coastal flooding along the South Shore of Staten Island. Considering up to 30 inches of sea level rise, the Breakwaters Project was designed to reduce wave heights 3 feet or less in up to a 100-year storm event, thereby reducing wave energy at the shoreline and minimizing risk to onshore assets previously exposed to wave action. The location and crest elevations of each breakwater segment were selected based on the relative need for storm wave attenuation along the shoreline. The Proposed Actions would not exacerbate flooding conditions. Type A breakwaters would be submerged with 30 inches of projected sea level rise, while Type B and C breakwaters would remain emergent structures with this same sea level rise. Even under increased water depths that occur during a storm surge, the structures would continue to dissipate wave energy and provide risk reduction for landward properties. The breakwaters would continue to attenuate waves even when the crests are submerged up to a depth of approximately 70 percent of the approaching wave heights.

A proposed 3.1-acre area of shoreline restoration between Loretto Street and Manhattan Street would add sediment to the overall system and augment the accretion potential provided by the breakwaters in one of the narrowest sections of the beach. This 3.1-acre area was selected for one-time shoreline restoration between Manhattan and Loretto Streets to reduce erosion and grow the beach within this portion of Conference House Park. The results of modeling indicate that this section of the beach would be slow to respond to the breakwaters and may not achieve the necessary width for risk reduction and maintaining public access.

The earthen berm, hybrid dune/revetment, eco-revetments, and raised edge of the Shoreline Project would increase the resilience of the shoreline and augment the risk reduction potential provided by the Breakwaters Project. Construction activities would be completed in accordance with a Stormwater Pollution Prevention Plan (SWPPP) prepared for the project as required by New York’s State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity (General Permit) in order to minimize erosion and sediment discharge during construction. Therefore, the Proposed Actions are consistent with Policies 11, 12, and 17.

(i) Development on a beach, dune, barrier island or other natural feature that provides protection against flooding or erosion?

[Policy 12]

The upland portion of the study area is located within the 100-year floodplain in Zones AE and VE. Zones AE and VE are considered Special Flood Hazard Areas (SFHA). Most of the south shore of Staten Island is designated as a Coastal Erosion Hazard Area (CEHA). The Proposed Actions would create a structural system of living breakwaters and shoreline risk reduction measures that would attenuate wave action, minimize shoreline erosion, and address the impacts of coastal flooding along the South Shore of Staten Island. Considering up to 30 inches of sea level rise, the Breakwaters Project was designed to reduce wave heights 3 feet or less in up to a 100-year storm event, thereby reducing wave energy at the shoreline and minimizing risk to onshore assets previously exposed to wave action. The location and crest elevations of each breakwater segment were selected based on the relative need for storm wave attenuation along the shoreline.

As discussed in Chapter 9, "Natural Resources," the breakwater system would maintain and restore the beach, a natural protective feature, while minimizing down-drift impacts. The breakwaters would attenuate waves and alter sediment transport along the shore for this purpose. Local sediment transport rates and accretion would be altered but the natural processes would not be blocked as there would still be sediment transport along the shore and tidal circulation around the breakwaters. The 3.1 acres of sand placement as part of the shoreline restoration proposed for the narrow section of shoreline between Loretto Street and Manhattan Street would add sediment to the overall system and augment accretion potential in a narrow section of the beach. The earthen berm, hybrid dune/revetment, eco-revetments, raised edge with revetment, and associated landscaping and ecological enhancements of the Shoreline Project would stabilize the shoreline and augment the wave attenuation and risk reduction potential provided by the Breakwaters Project. Green infrastructure measures and native coastal vegetation would increase infiltration of runoff from Shoreline Project elements.

Therefore, the Proposed Actions are consistent with Policy 12.

4. Will the proposed action be located in or have a significant effect upon an area included in an approved Local Waterfront Revitalization Program?

The Proposed Actions are consistent with the New York City Waterfront Revitalization Program.

Preparer's Name: Daniel Greene
(Please print)

Title: General Counsel Agency: Governor's Office of Storm Recovery

Telephone Number: (212) 480-4644 Date: June 1, 2018