A. INTRODUCTION

This chapter describes the floodplains, wetlands, existing terrestrial and aquatic flora and fauna, threatened or endangered species, and water quality within the natural resources[1] study area, and assesses whether the proposed actions could result in significant adverse impacts on natural resources.

Specifically, the chapter:

- Describes the regulatory programs that protect floodplains, wildlife, threatened or endangered species, aquatic resources, or other natural resources within and in the vicinity of the project site;
- Describes the current condition of the floodplain and natural resources within and in the vicinity of the project site, including water and sediment quality, and biological resources, including aquatic biota, terrestrial biota, and threatened or endangered species and species of special concern;
- Assesses floodplain, water quality, and natural resources conditions in the future without the proposed actions;
- Assesses the potential impacts of the proposed actions on floodplain, water quality, and natural resources; and,
- Discusses the measures that would be developed, as necessary, to mitigate and/or reduce any of the proposed actions' potential significant adverse effects on natural resources and floodplains.

The Office of the Deputy Mayor for Economic Development (ODMED), in coordination with the New York City Economic Development Corporation (NYCEDC) and the New York City Department of City Planning (DCP) proposes to rezone, obtain other land use approvals, and implement a comprehensive development plan for a portion of Coney Island, Brooklyn. The approximately 47-acre project site (**Figures 10-1** and **10-2**) is roughly bounded by West 8th and West 22nd Streets from Mermaid Avenue to the Boardwalk. Land cover within the project site consists mainly of open space/recreational facilities (e.g., KeySpan Park, Abe Stark Rink, active amusements and entertainment venues, and former GreenThumb community garden areas), developed land with commercial or residential uses, vacant land with low weedy vegetation, and surface parking facilities.

[1] Natural resources are defined as "Plant and animal species and any area capable of providing habitat for plant and animal species or capable of functioning to support ecological systems and maintain the city's environmental balance." (*City Environmental Quality Review [CEQR] Manual*, City of New York, 2001).

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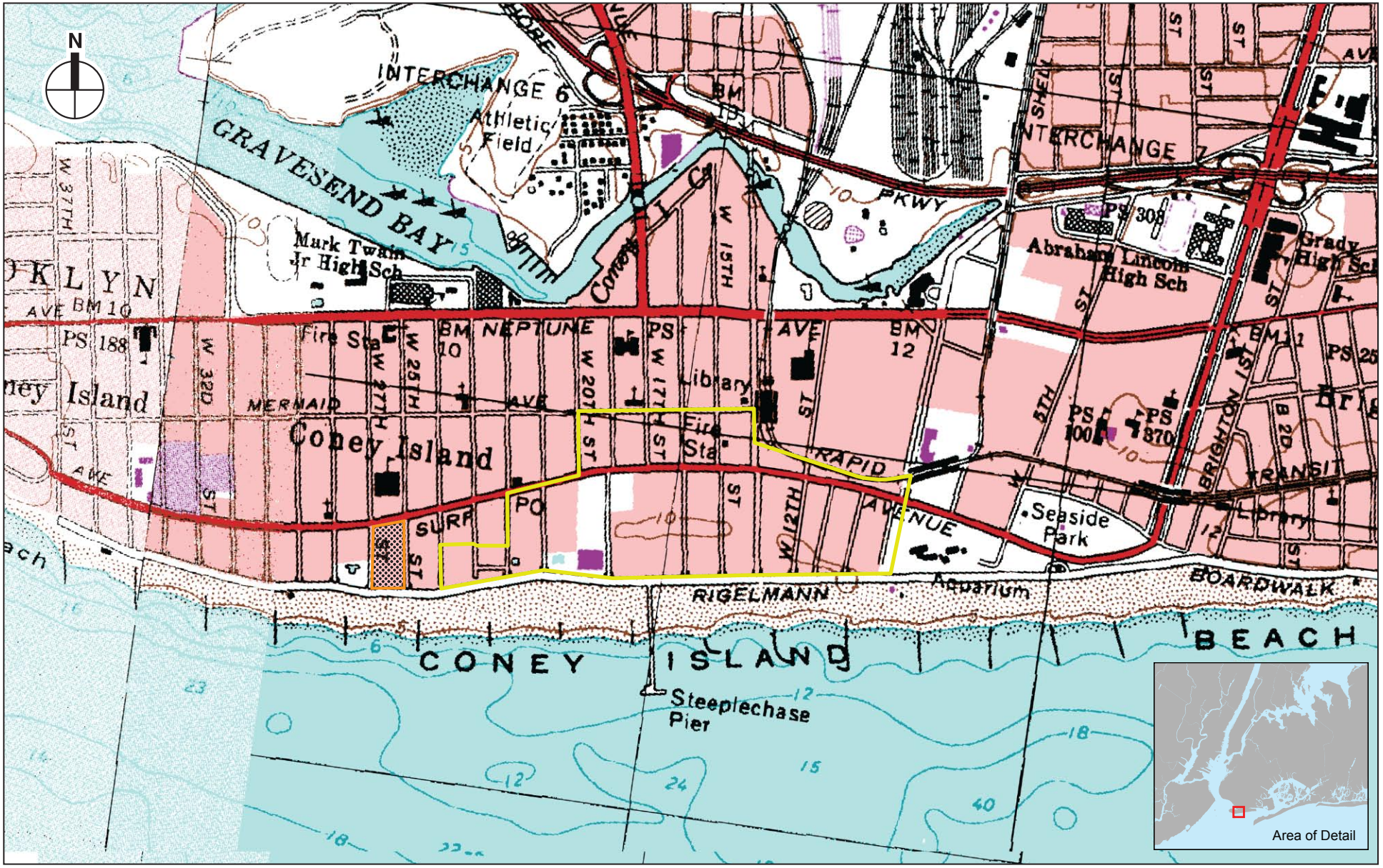

Rezoning Area Boundary

West 25th Street Parking Site

Approximate coordinates of Rezoning Area: 40° 34' 28" N, 73° 59' 0" W

0 1000 2000 FEET

SCALE

USGS 7.5 Minute Topographic Map - Coney Island Quad

1.14.09

Rezoning Area Boundary

West 25th Street Parking Site

0 400 800 FEET

SCALE

CONEY ISLAND REZONING

Current Land Cover

Figure 10-2

B. METHODOLOGY

REGULATORY CONTEXT

Activities associated with the proposed actions, such as the discharge of stormwater, development within the New York State Coastal Zone and 100-year floodplain, and/or that have the potential to affect surface waters, wetlands, or species of special concern, must comply with federal and state legislation and regulatory programs that pertain to activities in coastal areas, surface waters, floodplains, wetlands, and the protection of species of special concern.

FEDERAL

Clean Water Act (33 USC §§ 1251 to 1387)

The Clean Water Act (CWA), also known as the Federal Water Pollution Control Act, is intended to restore and maintain the chemical, physical, and biological integrity of U.S. waters. It regulates point sources of water pollution (i.e., discharges of municipal sewage, industrial wastewater, stormwater, and the discharge of dredged or fill material into navigable waters and other waters of the U.S.) and non-point source pollution (i.e., runoff from streets, agricultural fields, construction sites, and mining).

Coastal Zone Management Act of 1972 (16 USC §§ 1451 to 1465)

The Coastal Zone Management Act of 1972 established a voluntary participation program to encourage coastal states to develop programs to manage development within coastal areas to reduce conflicts between development and protection of resources within the coastal area. Federal permits issued in New York must be accompanied by a Coastal Zone Consistency Determination that evaluates consistency with New York's federally approved coastal zone management program.

Endangered Species Act of 1973 (16 USC §§ 1531 to 1544)

The Endangered Species Act of 1973 recognizes that endangered species of wildlife and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value. The Act prohibits the importation, exportation, taking, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival.

Fish and Wildlife Coordination Act (PL 85-624; 16 USC 661-667d)

The Fish and Wildlife Coordination Act entrusts the Secretary of the Interior with providing assistance to, and cooperation with, federal, state, and public or private agencies and organizations to ensure that wildlife conservation receives equal consideration and coordination with other water-resource development programs. These programs can include the control (such as a diversion), modification (such as channel deepening), or impoundment (dam) of a body of water.

NEW YORK STATE

Protection of Waters, Article 15, Title 5, New York State Environmental Conservation Law (ECL), Implementing Regulations 6 NYCRR Part 608.

The New York State Department of Environmental Conservation (NYSDEC) is responsible for administering Protection of Waters regulations to prevent undesirable activities on surface waters (streams, lakes, and ponds). The Protection of Waters Permit Program regulates five different categories of activities: disturbance of stream beds or banks of a protected stream or other watercourse; construction, reconstruction, or repair of dams and other impoundment structures; construction, reconstruction, or expansion of docking and mooring facilities; excavation or placement of fill in navigable waters and their adjacent and contiguous wetlands; and Water Quality Certification for placing fill or other activities that result in a discharge to waters of the United States in accordance with Section 401 of the CWA.

State Pollutant Discharge Elimination System (SPDES) (N.Y. ECL Article 3, Title 3; Article 15; Article 17, Titles 3, 5, 7, and 8; Article 21; Article 70, Title 1; Article 71, Title 19; Implementing Regulations 6 NYCRR Articles 2 and 3)

Title 8 of Article 17, ECL, Water Pollution Control, authorized the creation of the SPDES to regulate discharges to the state's waters. Activities requiring a SPDES permit include point source discharges of wastewater into surface or ground waters of the state, including the intake and discharge of water for cooling purposes, constructing or operating a disposal system, discharge of stormwater, and construction activities that disturb one acre or more.

Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Sections 910-921, Executive Law, Implementing Regulations 6 NYCRR Part 600 et seq.)

Under the Waterfront Revitalization of Coastal Areas and Inland Waterways Act, the New York State Department of State (NYSDOS) is responsible for administering the Coastal Management Program (CMP). The Act also authorizes the State to encourage local governments to adopt Waterfront Revitalization Programs (WRPs) that incorporate the state's policies. New York City has a WRP administered by DCP. Chapter 12, "Waterfront Revitalization Program," describes the proposed actions' consistency with the City's WRP.

Tidal Wetlands Act, Article 25, ECL, Implementing Regulations 6 NYCRR Part 661.

Tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis. Tidal wetlands occur along the salt-water shore, bays, inlets, canals, and estuaries of Long Island, New York City and Westchester County, and the tidal waters of the Hudson River up to the state line. NYSDEC administers the tidal wetlands regulatory program and the mapping of the state's tidal wetlands. A permit is required for almost any activity that would alter wetlands or the adjacent areas (up to 150 feet inland within New York City).

Floodplain Management Criteria for State Projects (6 NYCRR 502)

Under 6 NYCRR 502, state agencies must ensure that the use of state lands and the siting, construction, administration, and disposition of state-owned and state-financed projects involving any change to improved or unimproved real estate are conducted in ways that would minimize flood hazards and losses. Projects must consider alternative sites on which the project could be located outside the 100-year floodplain. Projects to be located within the floodplain are to be designed and constructed to minimize flood damage within the 100-year floodplain and include adequate drainage to reduce exposure to flood hazards. All public utilities and facilities

are to be located and constructed to minimize or eliminate flood damage. The regulations specify that for nonresidential structures, the lowest floor should be elevated or flood-proofed to no less than one foot above the base flood level so that below this elevation the structure, together with associated utility and sanitary facilities, is watertight, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. No project may be undertaken unless the cumulative effect of the proposed actions and existing developments would not cause material flood damage to existing development.

Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern (ECL, Sections 11-0535[1]-[2], 11-0536[2], [4], Implementing Regulations 6 NYCRR Part 182)

The Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern Regulations prohibit the taking, import, transport, possession or selling of any endangered or threatened species of fish or wildlife, or any hide, or other part of these species as listed in 6 NYCRR §182.6.

IMPACT ASSESSMENT

This section presents the methodology used to describe natural resources and floodplains within the study area under existing and future conditions, and to assess potential impacts to these resources from the proposed actions for the 2019 analysis year.

STUDY AREA

Figure 10-1 shows that the project site is in a low lying topographic area indirectly adjacent to the Lower New York Bay/Atlantic Ocean (Lower Bay). As described in Chapter 2, "Land Use, Zoning, and Public Policy" the predominant land use in the vicinity of the project site is residential, at a number of different densities, followed by amusement, institutional, industrial, commercial, and utility uses. Given the uniformity of the topography and land uses in this portion of Coney Island, the study area for terrestrial resources is within the limits of the project site. However, for the identification of threatened or endangered species, the study area extends for a distance of ½ mile from the project site.

The study area for wetlands and aquatic resources includes the Lower Bay off Coney Island Beach, Coney Island Creek, and Shell Bank Creek. As presented in Chapter 13, "Infrastructure," the project site is within the Coney Island Water Pollution Control Plant (WPCP) sewershed. The project site is serviced by a separated sewer system where stormwater runoff generated from within the project site north of Surf Avenue is directed to storm sewers that discharge to Coney Island Creek; stormwater generated from within the project site south of Surf Avenue is generally directed to storm sewers that discharge to the Lower Bay. In addition, portions of the study area do not have storm sewers. Sanitary sewage generated within the project site discharges to sanitary sewers and then to the 84-inch Coney Island Interceptor, which flows to the Coney Island WPCP. The outfall for the Coney Island WPCP is on Shell Bank Creek, a tidal water body that flows into Dead Horse/Gerritsen Inlet, located west of Jamaica Bay.

In summary, based on the diversity of potentially affected resources, the study area for wetlands and aquatic resources includes the Lower Bay off Coney Island Beach**,** Coney Island Creek, and Shell Bank Creek.

EXISTING CONDITIONS

Existing natural resources within the project site were summarized from the following sources:

- On-site field observations conducted between 7:00 AM and 5:00 PM on December 19, 2007. The primary objectives of the field observations were to: (1) qualitatively characterize dominant plant species/communities and wildlife populations within the project site and the study area, and (2) note the presence of threatened or endangered species and communities identified by NYSDEC's New York Natural Heritage Program (NYNHP) as having the potential to occur within the project site. On the basis of field observations, broad habitat classifications were developed for the project site following Edinger et al. (2002). Bird species were identified through visual observation and vocalization. Mammals were reported on the basis of visual observation, tracks, and scat.
- United States Geological Survey (USGS) topographic quadrangle map for Arthur Kill Quad.
- NYSDEC Breeding Bird Atlas, Critical Environmental Areas of Kings County, Tidal Wetlands Maps, Herp Atlas Project.
- Federal Emergency Management Agency (FEMA) Flood Insurance maps.
- United States Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) map for the USGS Arthur Kill topographic quadrangle.
- Ecological Communities of New York State (Reschke [1990], Edinger et al. [2002]).
- Responses to requests for information on rare, threatened, and endangered species or special habitats within the vicinity of the study area. These requests were submitted to USFWS, National Marine Fisheries Service (NMFS), and NYNHP.

FUTURE CONDITIONS WITHOUT THE PROPOSED ACTIONS

The future conditions without the proposed actions (No Build scenario) were assessed by considering existing natural resources and floodplains within the study area and assessing potential effects to these resources from projects proposed within and adjacent to the project site that are expected to occur independent of the proposed actions by the 2019 analysis year.

Floodplains, Groundwater, and Terrestrial Resources

In the future without the proposed actions, it is anticipated that the proposed rezoning area would experience modest growth in residential and commercial uses. No development is expected to occur in the Coney East and Coney West subdistricts, which would be unchanged from their current condition. Therefore, in the future without the proposed actions, groundwater, floodplains, and terrestrial resources would be unchanged within the Coney East and Coney West subdistricts. Most of the projected growth is expected in include residential and retail development within existing low-density residential communities. As presented in Table 1-2 in Chapter 1, "Project Description," by the 2019 analysis year, vacant land within the Coney North subdistrict and along Mermaid Avenue would be reduced by 160,415 square feet (sf) (from 457,376 sf to 296,961 sf), commercial uses would increase by 92,351 sf (from 143,853 sf to 236,204 sf), residential use would increase by 92,351 sf (from 14,429 sf to 627,469 sf), and 71,946 sf of community facilities. In addition to commercial and residential growth, NYCEDC and New York City Department of Parks and Recreation (DPR) are coordinating the development of a 2.2-acre public park directly south of KeySpan Park, featuring a performance green, skate park, carousel, and other amenities.

Water Quality and Aquatic Resources

The assessment of water quality and aquatic resources for the future without the proposed actions considered the projected increased development discussed above and ongoing proposed actions in the vicinity of the project sites, including:

- Water quality and sediment quality improvements expected to occur as a result of regional and local programs;
- Habitat enhancement or restoration activities associated with the New York/New Jersey Harbor Estuary Program (HEP) or Hudson-Raritan Estuary Ecosystem Restoration Project (HRE); and
- Water quality improvements in Coney Island Creek and Lower New York Bay resulting from New York City projects. These include the development of the Waterbody/Watershed Facility Plan for Coney Island Creek to address combined sewer overflow (CSO) discharges, a Drainage Basin-Specific Long-Term Control Plan (LTCP) for Coney Island Creek, and the City-wide LTCP that will be developed in compliance with the U.S. Environmental Protection Agency's (USEPA) CSO Control Policy, and as specified in the Consent Order signed by NYSDEC and the City in 2005 (NYSDEC Case No. CO2-20000107-8).

ASSESSMENT OF PROBABLE IMPACTS FROM THE PROPOSED ACTIONS

The proposed actions call for the redevelopment of approximately 47 acres of developable land on the Coney Island peninsula. The plan includes the demapping of 9.30 acres of parkland currently used primarily as asphalt parking lots for the KeySpan Park. As required, the demapped parkland would be replaced by the mapping of two parks along the Riegelmann Boardwalk: a 9.39-acre mapped open amusement park, which would become the centerpiece of a 27-acre amusement and entertainment district, and a 1.41-acre mapped neighborhood park which would result in the creation of an additional 1.5 acres of parkland in Coney Island. The incremental increase in development would result in approximately 251,411 square feet of amusement uses, 333,253 square feet of amusement enhancing uses such as eating and drinking establishments, 606 hotel rooms, 2,408 residential units (of which 607 would be affordable), 320,951 square feet of small-scale accessory retail, and 3,453 parking spaces, including 566 spaces for public parking. Under the reasonable worst-case development scenario (RWCDS) evaluated in this DEIS, it is assumed that the proposed actions would result in mixed-use development that would be supportive of retail, residential, recreational, and public space uses.

Probable impacts to floodplains and natural resources from the proposed actions in the 2019 analysis year, in comparison to the No Build scenario, were assessed by considering the following:

- The existing floodplain, and natural resources within the study area and adjacent areas;
- The results of the assessment of the No Build scenario;
- Potential effects to aquatic resources from the discharge of stormwater during construction of the RWCDS;
- Temporary impacts to terrestrial resources associated with construction of the components of the RWCDS;
- Potential operational effects to water quality and aquatic biota of Coney Island Creek and Lower New York Bay resulting from the discharge of stormwater generated within the project site to the separate storm sewer;

- Potential operational effects to water quality and aquatic biota of Shell Bank Creek resulting from the discharge of sanitary sewage generated within the project site to the Coney Island Creek WPCP; and
- Potential long-term impacts to flood plains and natural resources from operation of the RWCDS, including new open space and landscaped areas and the potential for the RWCDS to result in significant adverse impacts to birds due to collision with buildings (i.e., bird strike potential).

C. EXISTING CONDITIONS

SITE HISTORY

As described in Chapter 2, "Land Use, Zoning, and Public Policy" and Chapter 7, "Historic Resources," until the early 1800s, the Coney Island area was used primarily for the grazing of animals. Between 1840 and 1870 it became a popular summer destination but had few year-round residents. Development increased after 1870 with the construction of five railroads linking the area to the rest of Brooklyn. The clearing of large areas of waterfront by fires in the early 1890s resulted in the new development along the Coney Island waterfront, including the development of three large amusement parks between 1897 and 1904. The City built a boardwalk along the beach in 1923 to accommodate the large number of visitors to the beach in the summer. Steeplechase Park, featuring a ferris wheel, bathhouses and, in 1940, the Parachute Jump, occupied a 15-acre site where KeySpan Park is located today. Luna Park, a 38-acre amusement park, located between Surf and Neptune Avenues at West 8th and 10th Streets, was destroyed by fire in 1944. The land was redeveloped with housing in the 1950s. Dreamland was destroyed by fire in 1911 and is now occupied by the New York Aquarium.

The Housing Act of 1949 effectively started urban renewal efforts in New York City, and large tracts of land in Coney Island were slated for clearance and redevelopment. The Coney Island Urban Renewal Area was subsequently created, bounded by Neptune Avenue to the north, Stillwell Avenue to the east, Surf Avenue to the south, and West 37th Street to the west. Redevelopment of portions of Coney Island with high-residential buildings occurred during the 1950s and 1960s, and continued into the late 1960s and 1970s. Steeplechase Park was cleared in 1966 for a proposed housing development that was never constructed and is now the location of KeySpan Park, an 8,000-seat minor-league baseball stadium that opened in 2001. Amusement areas surrounding the former Steeplechase Park site (e.g., a roller coaster, batting cages and a go-kart race track) were removed from the project site prior to the 2007 summer season. Amusement and recreational facilities currently located within the project site in addition to KeySpan Park include Astroland Amusement Park (which closed at the end of summer 2008) and Deno's Wonder Wheel Amusement Park. Vacant land and parking lots are located in between these attractions. Images of natural resources at and in the vicinity of the project site are presented in Appendix C, Figures C-1 to C-11.

GROUNDWATER

As presented in Chapter 11, "Hazardous Materials," the project site is located at approximately 10 feet above mean seal level (msl). Bedrock is expected at a depth of approximately 650 feet beneath the ground surface. On the basis of USGS data (Misut and Monti 1999) the approximate depth to the water table (i.e., Upper Glacial aquifer) is approximately 5 feet. Groundwater is expected to flow in a southerly direction toward the Lower New York Bay, but is also expected

to be tidally influenced. Groundwater flow could be additionally influenced by past filling activities, underground utilities, and other subsurface openings or obstructions such as basements. The project site is within the area designated for the Brooklyn Queens Sole Source Aquifer (USEPA 1983). This aquifer system comprises four distinct formations within the unconsolidated materials overlying the bedrock: the Upper Glacial, the Jameco, the Magothy and the Lloyd aquifers. The Upper Glacial aquifer is not used as a drinking water supply. Within central Kings County, the Upper Glacial aquifer is more than 200 feet thick (de Laguna 1948 in USGS 1997). Groundwater is not used as a potable water supply in this part of Brooklyn, and non-potable use is limited.

FLOODPLAINS

Figure 10-3 shows the 100-year (1 percent annual chance of flooding) and 500-year (0.2 percent annual chance of flooding) floodplain boundaries within the project site. FEMA has identified the 100-year floodplain elevation at elevation 10 feet National Geodetic Vertical Datum of 1929 (NGVD 29). The entire project site is within the 100-year floodplain.

WETLANDS

PROJECT SITE

The project site contains no NYSDEC-mapped freshwater wetlands (see **Figure 10-4**). During the December 2007 natural resources site visit, a small (i.e., approximately 15 sf) palustrine cultural open water wetland pocket was noted in Block 7074 between West 15th Street and 16th Street south of Bowery Street (Appendix C, Figure C-8; Image 14). Land cover within this portion of Block 7074 was primarily impervious surface, some of which had vegetation growing in crevices, and a commercial structure (Playland). The palustrine wetland was located in a depression within an area of construction debris south of Playland and was vegetated primarily by common reed (*Phragmites australis*). Freshwater was observed to be flowing at a slow rate from a subsurface source in the vicinity of construction rubble, such as sections of concrete. The hydrologic source for this small freshwater area was not confirmed during the site survey. However, evidence of construction activity at and in the vicinity of the wetland, suggests that the water source may be an infrastructure-related leak. No NWI-classified wetlands are present on the project site (see **Figure 10-5**). Further investigation to confirm the freshwater source would be undertaken by the New York City Department of Environmental Protection (DEP) prior to the start of construction.

STUDY AREA

Lower New York Bay and Coney Island Creek

Lower New York Bay is a marine system consisting of open waters and a high energy coastline with little shelter from wind and waves. Coney Island Creek, a tributary to Lower New York Bay, is approximately 1.6 miles long and is situated northwest of the project site (see **Figure 10-1**). The USFWS National Wetlands Inventory (NWI) (see **Figure 10-5**) classifies the beach area south of the project site, within the portion of the study area in Lower New York Bay, as an irregularly flooded intertidal unconsolidated shore (M2USP) (NWI 2008). Unconsolidated shores include wetland habitats having less than 75 percent areal cover of stone or bedrock; less than 30 percent areal cover of vegetation other than pioneer plants; and a diverse water regime including temporary, permanent, and irregular flooding or exposure. The open water portion of

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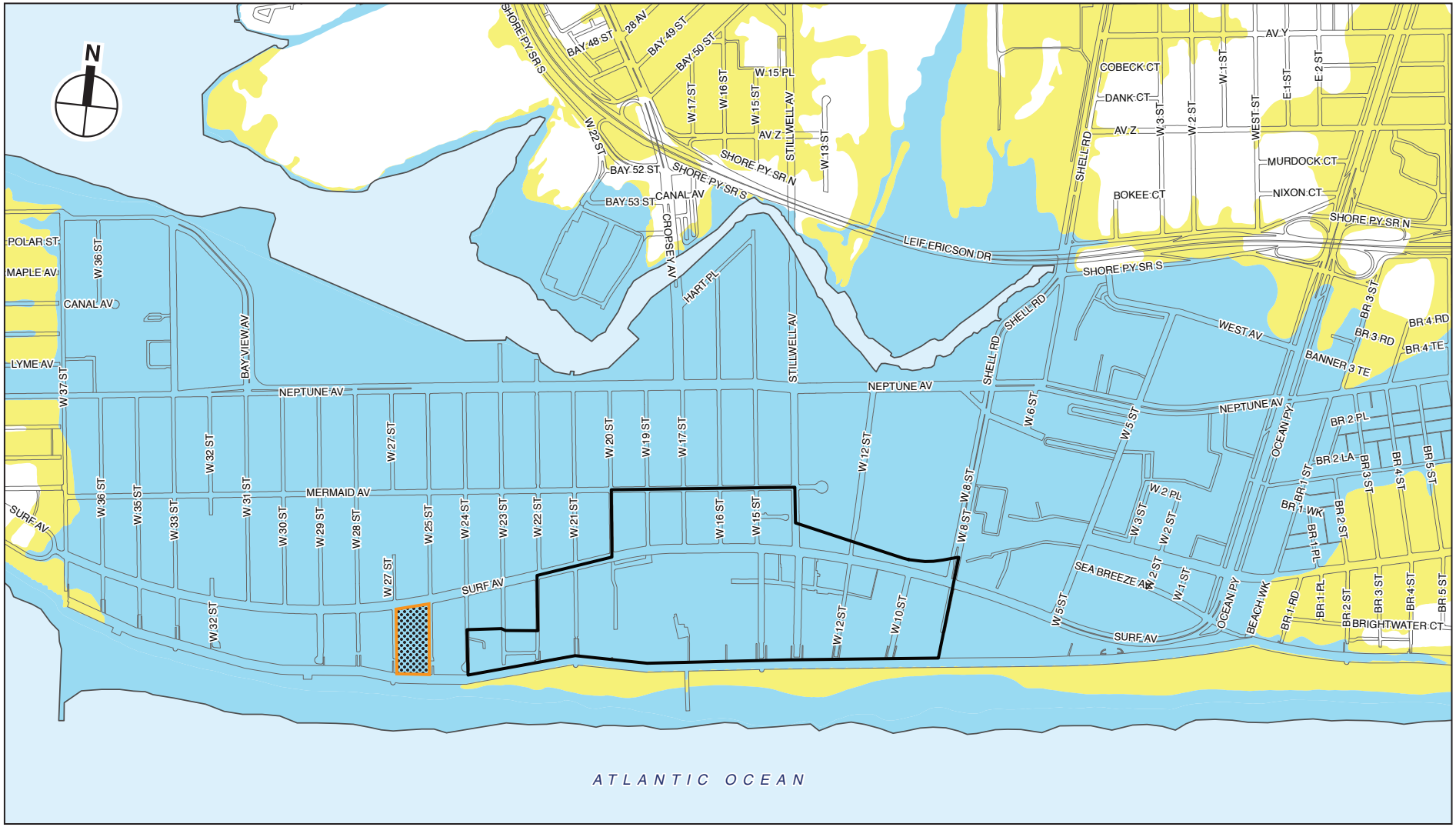

Source: Digital Flood Insurance rate Map Database, FEMA, 2007

Rezoning Area Boundary

West 25th Street Parking Site

0 1,250 2,500 FEET

SCALE

Flood Zone

100-year Flood

500-year Flood

CONEY ISLAND REZONING

FEMA Flood Hazard Areas

Figure 10-3

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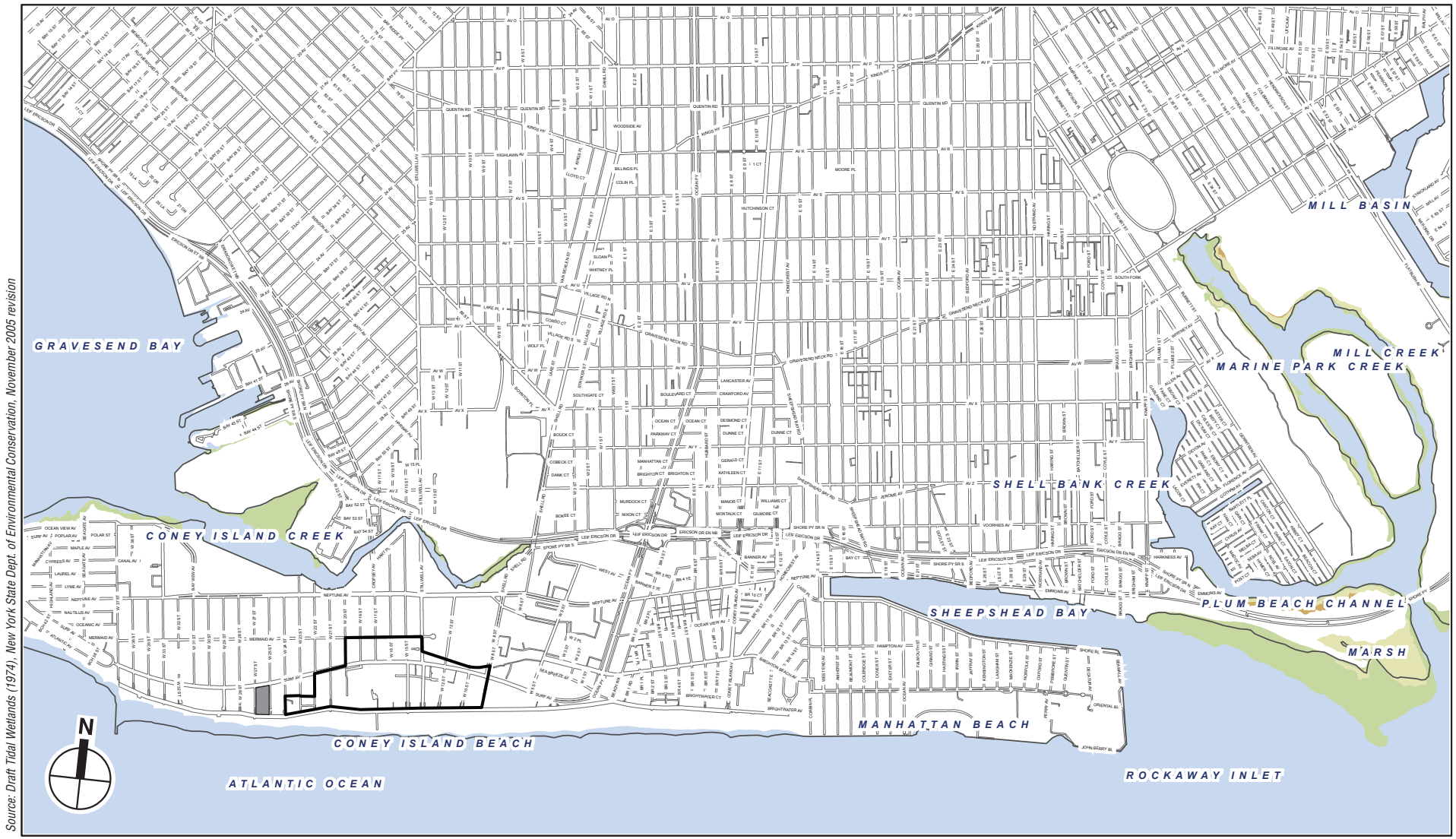

Source: Draft Tidal Wetlands (1974), New York State Dept. of Environmental Conservation, November 2005 revision

Rezoning Area Boundary

West 25th Street Parking Site

Littoral Zone

High Marsh

Intertidal Marsh

Coastal Shoals, Bars, and Mudflats

0 6000 FEET

SCALE

NYSDEC Tidal Wetlands

CONEY ISLAND REZONING

Figure 10-4

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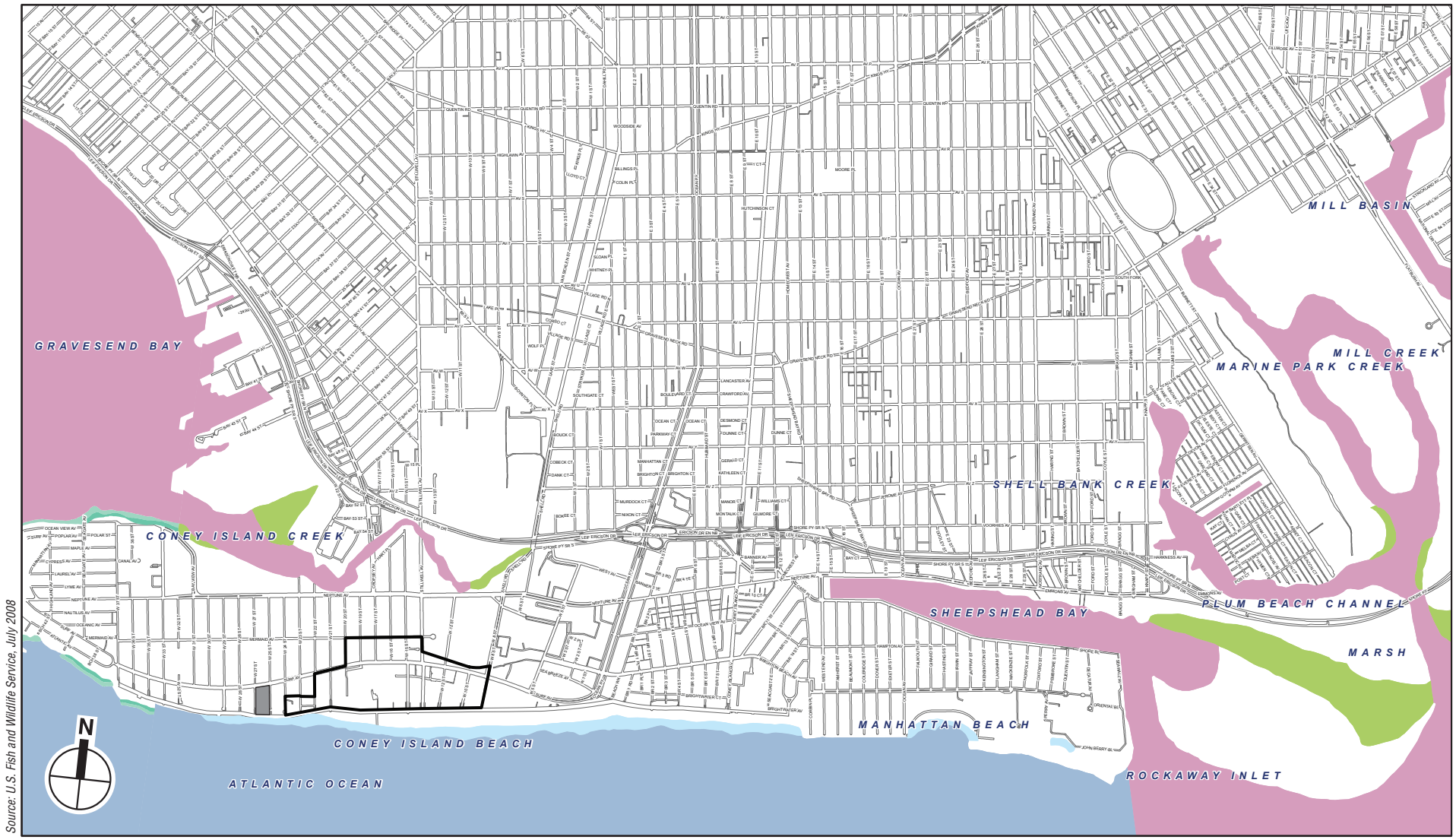

Source: U.S. Fish and Wildlife Service, July 2008

Rezoning Area Boundary

West 25th Street Parking Site

E1UBL - Estuarine Subtidal Unconsolidated Bottom Subtidal

E2US2N - Estuarine Intertidal Unconsolidated Shore Sand Regularly Flooded

E2US2P - Estuarine Intertidal Unconsolidated Shore Sand Subtidal

E2USN - Estuarine Intertidal Unconsolidated Shore Regularly Flooded

M1UBL - Marine Subtidal Unconsolidated Bottom Subtidal

M2USP - Marine Intertidal Unconsolidated Shore Irregularly Flooded

0 6000 FEET

SCALE

CONEY ISLAND REZONING

National Wetlands Inventory

Figure 10-5

Lower New York Bay to the south of the beach is classified as having an unconsolidated bottom with permanently submerged substrate that is always inundated with tidal water (M1UBL).

Wetlands at the head of Coney Island Creek and a 20-acre tidal mudflat on the north shore of the creek at the edge of Calvert Vaux Park are classified by the NWI as estuarine intertidal with a regularly flooded unconsolidated shore (E2USN) (see **Figure 10-5**). From the head of Coney Island Creek, depths begin to increase to approximately 7 to 8 feet at mean-low-water (MLW) near Cropsey Avenue and continue to deepen to 14 to 26 feet at MLW at the mouth of the creek. The unconsolidated bottom substrates at the mouth of the creek are continuously submerged at depths below extreme MLW and are always inundated with tidal waters (E1UBL). The intertidal beach located on the southern shore of the creek mouth supports sandy, unconsolidated shore wetlands that are both regularly flooded (E2US2N) and irregularly flooded (E2US2P) (see **Figure 10-5**).

NYSDEC designates portions of Lower New York Bay adjacent to the project site and parts of Coney Island Creek as littoral zone (LZ) tidal wetlands. The New York State Tidal Wetland Regulations (6 NYCRR Part 661.4) define LZ as:

> The tidal wetlands zone designated LZ on an inventory map, that includes all lands under tidal waters which are not included in any other category except as otherwise determined in a specific case as provided in section 661.16. Provided there shall be no littoral zone under waters deeper than six feet at mean low water…

During periods of low tide, the head of Coney Island Creek becomes an exposed mudflat. Water depths in the eastern end of Coney Island Creek at mean-high-water (MHW) range between 2 and 4 feet, indicating that depths at MLW would meet NYSDEC's definition for LZ tidal wetlands (see **Figure 10-4**).

Shell Bank Creek Tidal Wetlands

The NWI classifies the majority of Shell Bank Creek as estuarine subtidal wetlands with unconsolidated bottom that is permanently flooded with tidal water (E1UBL). However, the NWI identifies an intertidal emergent wetland (contains rooted hydrophytes) that is irregularly flooded with moderately brackish water (E2EM5P) on the south side of the creek, near the confluence with Dead Horse/Gerritsen Inlet (see **Figure 10-5**).

TERRESTRIAL RESOURCES

PROJECT SITE

Plant Communities

Communities described in this section follow nomenclature from the New York Natural Heritage Program (Reschke 1990, Edinger et al. 2002).

Land cover on the project site comprises residential, commercial and recreational development, roads and parking areas, and both vegetated and unvegetated vacant lots (see **Figure 10-2**). The project site is best described as a collection of "terrestrial cultural" communities (Edinger et al. 2002), which are:

> …either created and maintained by human activities, or are modified by human influence to such a degree that the physical conformation of the substrate, or the

> biological composition of the resident community is substantially different from the character of the substrate or community as it existed prior to human influence.

However, it is important to note the influence of the adjacent sand beach habitat on plant populations found within the project site. As described below, some vacant areas with exposed sandy substrates have been colonized by species found in sand beach habitats.

Three types of "terrestrial cultural" communities are present within the project site: urban vacant lot, urban structure exterior, and mowed lawns with trees. Appendix C contains representative photographs of the vegetation communities observed on the project site.

- **Urban vacant lot**—Portions of the project site can be characterized as urban vacant lot, which is defined in Edinger et al. (2002) as "an open site in a developed, urban area that has been cleared either for construction…..vegetation may be sparse, with large areas of exposed soil, and often with rubble or other debris." Urban vacant lot habitats on the project site, which are dominated by street trees (i.e., London plane, black locust) and non-native, invasive trees and herbaceous cover (i.e., tree-of-heaven, mugwort). Vegetated vacant lots present on the project site are composed mainly of graminoid, forb, and herbaceous plant species covering up to 75 percent of the lot area.
- **Urban structure exterior—**Areas classified as urban structure exterior are defined in Edinger et al. (2002) as "the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks." Several areas within the project site with active or abandoned structures meet these criteria.
- **Mowed lawns with trees—**A limited area of public parkland exists within the eastern portion of the project site, described as "recreational land in which the groundcover is dominated by clipped grasses and forbs….shaded by at least 30 percent cover of trees…ornamental and/or native shrubs with less than 50 percent cover….[and] groundcover is maintained by mowing." A portion of the 22-acre Asser Levy Park and the New York Aquarium is located at the eastern border of the project site and contains a small, shaded park, landscaped trees and shrubs (e.g., American holly, Japanese barberry, English ivy, yew), regularly mowed grass lawns, and other ornamental herbaceous plants.

In addition to these three "terrestrial cultural" communities, an additional terrestrial community is present along the southern edge of the project site:

Sand beach/maritime dune—The southern edge of the project site, which terminates at Riegelmann Boardwalk, is a transitional area between developed and vacant areas and sand beach extending south of the project site to Rockaway Inlet. The beach is used primarily for recreation, and is largely unvegetated due to routine maintenance, such as trash clearing by mechanical beach cleaners. The area underneath the boardwalk is primarily sand beach.

Within the project site, small distinct patches (<0.25 acres total) of maritime dune habitat were observed north of the boardwalk containing substrate and flora consistent with a maritime dune habitat as described by Edinger et al. "Ecological Communities of New York State" (2002):

> a community dominated by grasses and low shrubs that occurs on active and stabilized maritime dunes along the Atlantic coast. This community consists of a mosaic of vegetation patches. This mosaic reflects past disturbances such as sand deposition,

erosion, and maritime dune migration. The composition and structure of the vegetation is variable depending on stability of the maritime dunes, amounts of sand deposition and erosion, and distance from the ocean.

Characteristic species of the active maritime dunes, where sand movement is greastest, include beachgrass (*Ammophila breviligulata*), dusty-miller (*Artemisia stelleriana*), beach pea (*Lathyrus japonicus*), sedge (*Carex silicea*), seaside goldenrod (*Solidago sempervirens*), and sand-rose (*Rosa rugosa*). Characteristic species of stabilized maritime dunes include beach heather (*Hudsonia tomentosa*), bearberry (*Arctostaphylos uva-ursi*), beachgrass (*Ammophila breviligulata*), cyperus (*Cyperus polystachyos* var. *macrostachyus*), seaside goldenrod (*Solidago sempervirens*), beach pinweed (*Lechea maritima*), jointweed (*Polygonella articulata*), sand-rose (*Rosa rugosa*), bayberry (*Myrica pensylvanica*), beach-plum (*Prunus maritima*), poison ivy (*Toxicodendron radicans*), and the lichens *Cladina submitis* and *Cetraria arenaria*). Seabeach amaranth (*Amaranthus pumilus*) is a federally threatened plant that is found on the dynamic foremaritime dune of some maritime dunes. A few stunted pitch pines (*Pinus rigida*) or post oaks (*Quercus stellata*) may be present in the maritime dunes.

Two areas of maritime dune habitat appeared to be a successional community at the early stage of colonization by dune flora as well as introduced and invasive species common to urban vacant lots. Both maritime dune habitats are separated from the sand beach habitat to the south by the boardwalk, and appear to be a result of natural processes occurring in the absence of human disturbance. Maritime dune 1 (immediately north of the boardwalk, east of the southern end of West 21st Street) is a sandy area approximately 0.15 acres in size (Appendix C, Figure C-3, Image 4). American beach grass, sea rocket, beach pea and seaside goldenrod are the maritime dune plants observed in this area. Introduced species found within the dune include common reed, Japanese knotweed, and horseweed. Maritime dune 2 (north of the boardwalk, south of Highland View Avenue, and between West 22nd and 23rd Streets) is a sandy rise approximately 0.1 acres in size (Appendix C, Figure C-2). American beach grass and sea rocket are the maritime dune plants observed in this area. Coverage by dune plants was less than at Maritime dune 1. Introduced plant species include several cottonwood trees, common reed, mugwort, evening primrose and tall reed.

Table 10-1 lists the plant species observed within the project site. In general, the plant communities are dominated by introduced herbaceous species that are efficient at colonizing disturbed areas (i.e., mugwort, Japanese knotweed, common reed, Queen Anne's lace, great mullein, and red clover), as well as forbs and grasses that are successful in sandy soils (i.e., goldenrods, beach grass, and common milkweed). Woody vegetation is relatively sparse and limited to planted street and park trees (i.e., London plane, American sycamore, pin oak), early successional species (i.e., eastern cottonwood, eastern red cedar), and species well adapted to disturbed urban soils (i.e., tree-of-heaven, black locust, autumn olive). Undeveloped, vegetated areas within the project site appeared to be periodically disturbed (i.e., mowing, brush fires), which has thereby limited woody vegetation within vacant lots to individual or small stands of trees and shrubs.

Table 10-1
Plant Species Observed at Project Site During December 2007 Site Visit

Habit	Species	Common
Forb/Herb	*Amaranthus retroflexus*	Green Amaranth
Forb/Herb	*Ambrosia artemisiifolia*	Common Ragweed
Forb/Herb	*Ambrosia vulgaris*	Mugwort
Forb/Herb	*Arctium sp.*	Burdock sp.
Forb/Herb	*Asclepias syriaca*	Common Milkweed
Forb/Herb	*Aster pilosus*	Heath Aster
Forb/Herb	*Aster sp.*	Aster sp.
Forb/Herb	*Cakile edentula*	Sea Rocket
Forb/Herb	*Chenopodium album*	Lambs Quarters
Forb/Herb	*Datura stramonium*	Jimsonweed
Forb/Herb	*Daucus carota*	Queen Anne's Lace
Forb/Herb	*Erigeron annuus*	Daisy Fleabane
Forb/Herb	*Erigeron canadensis*	Horseweed
Forb/Herb	*Euthamia graminifolia*	Lance-leaved Goldenrod
Forb/Herb	*Lathyrus sp.*	Pea sp.
Forb/Herb	*Lepidium campestre*	Field Peppergrass
Forb/Herb	*Lespedeza sp.*	Bush Clover sp.
Forb/Herb	*Oenothera biennis*	Common Evening Primrose
Forb/Herb	*Phyolacca americana*	Pokeweed
Forb/Herb	*Plantago lanceolata*	English Plantain
Forb/Herb	*Plantago major*	Common Plantain
Forb/Herb	*Polygonum cuspidatum*	Japanese Knotweed
Forb/Herb	*Rumex crispus*	Curly Dock
Forb/Herb	*Rumex obtusifolius*	Bitter Dock
Forb/Herb	*Solidago sempervirens*	Seaside Goldenrod
Forb/Herb	*Solidago spp.*	Goldenrod sp.
Forb/Herb	*Thlaspi arvense*	Field Pennycress
Forb/Herb	*Trifolium pratense*	Red Clover
Forb/Herb	*Verbascum thapsus*	Common Mullein
Forb/Herb	*Vicia cracca*	Cow Vetch
Graminoid	*Ammophila brevilgulata*	Beach Grass
Graminoid	*Eragrostis spectabilis*	Purple Love Grass
Graminoid	*Festuca spp.*	Fescue sp.
Graminoid	*Panicum*sp.	Switchgrass
Graminoid	*Phragmites australis*	Common Reed
Graminoid	*Seteria*	Foxtail sp.
Graminoid	*Seteria magna*	Giant Foxtail
Shrub	*Berberis thunbergii*	Japanese Barberry
Shrub	*Elaeagnus umbellata*	Autumn Olive
Shrub	*Forsythis intermedia*	Forsythia
Shrub	*Ligustrum sp.*	Privet species
Shrub	*Taxus canadensis*	Yew sp.
Tree	*Ailanthus altissima*	Tree-of-Heaven
Tree	*Albizia julibrissin*	Mimosa Tree
Tree	*Gleditis triacanthos*	Honey Locust
Tree	*Ilex opaca*	American Holly
Tree	*Juniperus sp.*	Eastern Red Cedar
Tree	*Morus sp.*	Mulberry
Tree	*Pinus thunbergii*	Japanese Black Pine
Tree	*Platanus acerifolia*	London Planetree
Tree	*Platanus occidentalis*	American Sycamore
Tree	*Populus deltoides*	Common Cottonwood

Table 10-1 (cont'd)
Plant Species Observed at Project Site During December 2007 Site Visit

Habit	Species	Common
Tree	*Prunus serotina*	Black Cherry
Tree	*Prunus* sp.	Cherry sp.
Tree	*Quercus palustris*	Pin Oak
Tree	*Robinia pseudo-acacia*	Black Locust
Tree	*Robinia pseudo-acacia*	Black Locust
Tree	*Thuja occidentalis*	Arborvitae
Tree	*Tsuga canadensis*	Eastern Hemlock
Vine	*Celastrus orbiculatus*	Oriental Bittersweet
Vine	*Hedera helix*	English Ivy
Vine	*Lonicera japonica*	Japanese Honeysuckle

Notes: Field survey conducted by AKRF in December 2007.
Sources: AKRF 2007 field survey.

Wildlife

Due to the limited available habitat and extensive human use within the project site, wildlife expected to occur within the site would be largely composed of species adapted to urban, human-dominated landscapes. The project site contains habitat in developed areas (i.e., street trees, manicured parklands, lawns, and buildings) that provides cover, food resources, nesting substrate, and protection for wildlife. Vegetated cover within undeveloped portions of the project site (i.e., vacant lots) composed of mixed grassland, shrubs and trees also has the potential to support some wildlife adapted to urban and edge habitats, unvegetated areas (i.e., sandy vacant lots) offer habitat for species that nest (i.e., killdeer), forage, or rest in open areas. Structural features, such as buildings and boardwalks, also provide nesting substrate, cover, and protection for wildlife.

The following sections describe the species of birds, mammals, reptiles and amphibians, and insects that were observed or have the potential to occur within the project site. Most wildlife observed on the site were common species that would be expected to reproduce (i.e., European starling, house sparrow, house finch, rock pigeon, Eastern gray squirrel) or overwinter (i.e., gulls, waterfowl, shorebirds) at the project site.

Birds

Table 10-2 lists bird species with the potential to occur at the project site and adjacent marine waters during breeding, migration, and wintering seasons. Common urban-adapted passerine species would be expected to be prevalent within the terrestrial habitats present on the project site throughout the year (i.e., European starling, house sparrow, house finch, rock pigeon). Other bird species that breed (i.e., killdeer, mourning dove, downy woodpecker), overwinter (i.e., American tree sparrow, white-throated sparrow, slate colored junco), and migrate (i.e., palm warbler, yellow-breasted chat) are also likely to use most vegetated habitats within the project site. Due to the extensive marine waters adjacent to the project site, and its proximity to extensive open water and marsh habitats within Jamaica Bay, numerous species of waterfowl and shorebirds would be prevalent at or near the shoreline during migratory and wintering periods (i.e., Atlantic brant, bufflehead, lesser scaup, red-breasted merganser). During the December 2007 field observations an adult peregrine falcon was observed on top of the Parachute Jump structure on the southern edge of the project site. It is likely that this open coastal habitat would provide foraging resources for both migrating and breeding raptors.

Table 10-2
Bird species with the potential to occur at or adjacent to the project site (Coney Island, Brooklyn, NY)

Common Name	Scientific Name	Observed during AKRF 2007 field observation
Snow Goose	*Chen caerulescens*	
Atlantic Brant	*Branta bernicla*	X
Canada Goose	*Branta canadensis*	X
Mute Swan	*Cygnus olor*	
Wood Duck	*Aix sponsa*	
Gadwall	*Anas strepera*	
Eurasian Wigeon	*Anas Penelope*	
American Wigeon	*Anas Americana*	
American Black Duck	*Anas rubripes*	X
Mallard +	*Anas platyrhynchos*	X
Northern Shoveler	*Anas clypeata*	
Northern Pintail	*Anas acuta*	
Green-winged Teal	*Anas crecca*	
Canvasback	*Aythya valisineria*	
Redhead	*Anas Americana*	
Ring-necked Duck	*Aythya collaris*	
Greater Scaup	*Aythya marila*	
Lesser Scaup	*Aythya affinis*	X
Surf Scoter	*Melanitta perspicillata*	X
White-winged Scoter	*Melanitta fusca*	
Black Scoter	*Melanitta nigra*	
Long-tailed Duck	*Clangua hyemalis*	
Bufflehead	*Bucephala albeola*	X
Common Goldeneye	*Bucephala clangula*	
Hooded Merganser	*Lophodytes cucullatus*	
Common Merganser	*Mergus merganser*	
Red-breasted Merganser	*Merganser serrator*	X
Ruddy Duck	*Oxyura jamaicensis*	
Ring-necked Pheasant +	*Phasianus colchicus*	
Red-throated Loon	*Gavia stellata*	X
Common Loon	*Gavia immer*	
Pied-billed Grebe	*Podilymbus podiceps*	
Horned Grebe	*Podiceps auritus*	X
Red-necked Grebe	*Podiceps grisegena*	
Northern Gannet	*Morus bassanus*	
Double-crested Cormorant	*Phalacrocorax auritus*	
Great Cormorant	*Phalacrocorax carbo*	X
Great Blue Heron	*Ardea Herodias*	
Great Egret	*Ardea alba*	
Black-crowned Night-Heron	*Nycticorax nycticorax*	
Northern Harrier	*Circus cyaneus*	
Sharp-shinned Hawk	*Accipiter striatus*	
Cooper's Hawk	*Accipiter cooperii*	
Northern Goshawk	*Accipiter gentilis*	
Red-tailed Hawk	*Buteo jamaicensis*	
Rough-legged Hawk	*Buteo lagopus*	
American Kestrel +	*Falco sparverius*	
Merlin	*Falco columbarius*	

Table 10-2 (cont'd)
Bird species with the potential to occur at or adjacent to the project site (Coney Island, Brooklyn, NY)

Common Name	Scientific Name	Observed during AKRF 2007 field observation
Peregrine Falcon	*Falco peregrinus*	X
Clapper Rail	*Rallus longirostrus*	
American Coot	*Fulica Americana*	
Black-bellied Plover	*Pluvialis squatarola*	
Killdeer +	*Charadrius vociferous*	
American Oystercatcher	*Haematopus palliatus*	
Greater Yellowlegs	*Tringa melanoleuca*	
Ruddy Turnstone	*Arenaria interpres*	
Sanderling	*Calidris alba*	X
Purple Sandpiper	*Calidris maritime*	X
Dunlin	*Calidris alpine*	
American Woodcock	*Scolopax minor*	
Bonaparte's Gull	*Larus Philadelphia*	
Ring-billed Gull	*Larus delawarensis*	X
Herring Gull	*Larus argentatus*	X
Great Black-backed Gull	*Larus marinus*	X
Rock Pigeon +	*Columba livia*	X
Mourning Dove +	*Zenaida macroura*	X
Monk Parakeet	*Myiopsitta monachus*	
Barn Owl	*Tyto alba*	
Belted Kingfisher	*Ceryle alcyon*	
Red-bellied Woodpecker	*Melanerpes carolinus*	
Yellow-bellied Sapsucker	*Sphyrapicus varius*	
Downy Woodpecker +	*Picoides pubescens*	X
Hairy Woodpecker	*Picoides villosus*	
Northern Flicker	*Colaptes auratus*	X
Blue Jay	*Cyanocitta cristata*	
American Crow +	*Corvus brachyrhynchos*	
Fish Crow +	*Corvus ossifragus*	X
Horned Lark	*Eremophila alpestris*	
Barn Swallow +	*Hirundo rustica*	
Black-capped Chickadee	*Poecile artricapillus*	X
Tufted Titmouse	*Baeolophus bicolor*	
Red-breasted Nuthatch	*Sitta Canadensis*	
White-breasted Nuthatch	*Sitta carolinensis*	
Brown Creeper	*Certhia Americana*	
Carolina Wren	*Thryothorus ludovicianus*	
House Wren	*Troglodytes aedon*	
Winter Wren	*Troglodytes trogloytes*	
Golden-crowned Kinglet	*Regulus satrapa*	
Ruby-crowned Kinglet	*Regulus calendula*	
Hermit Thrush	*Catharus guttatus*	
American Robin +	*Turdus migratorius*	
Gray Catbird +	*Dumetella carolinesis*	
Northern Mockingbird +	*Mimus polyglottos*	X
European Starling +	*Sturnus vulgaris*	X
American Pipit	*Anthus rubescens*	
Cedar Waxwing	*Bombycilla cedrorum*	

Table 10-2 (cont'd)
Bird species with the potential to occur at or adjacent to the project site (Coney Island, Brooklyn, NY)

Common Name	Scientific Name	Observed during AKRF 2007 field observation
Yellow Warbler +	*Dendroica petechia*	
Yellow-rumped Warbler	*Dendroica coronata*	
Pine Warbler	*Dendroica pinus*	
Palm Warbler	*Dendroica palmarum*	
Yellow-breasted Chat	*Icteria virens*	
Eastern Towhee	*Pipilo erythrophthalmus*	
American Tree Sparrow	*Spizella arborea*	X
Chipping Sparrow	*Spizella passerine*	
Field Sparrow	*Spizella pusilla*	
Savannah Sparrow	*Passerculus sanwichensis*	X
Fox Sparrow	*Passerella iliaca*	
Song Sparrow +	*Melospiza melodia*	
Swamp Sparrow	*Melospiza georgiana*	
White-throated Sparrow	*Zonotrichia albicollis*	
Dark-eyed Junco	*Junco hyemalis*	X
Lapland Longspur	*Calcarius lapponicus*	
Snow Bunting	*Plectrophenax nivalis*	X
Northern Cardinal +	*Cardinalis cardinalis*	
Red-winged Blackbird +	*Agelaius phoeniceus*	
Eastern Meadowlark	*Sturnella magna*	
Rusty Blackbird	*Euphagus carolinus*	
Common Grackle	*Quiscalus quiscula*	
Boat-tailed Grackle	*Quiscalus major*	
Brown-headed Cowbird	*Molothrus ater*	
House Finch +	*Carpodacus mexicanus*	X
American Goldfinch	*Carduelis tristis*	X
House Sparrow +	*Passer domesticus*	X

Notes: " + " denotes breeding birds observed within the Coney Island survey block (5849C) during the 2000-2005 NYSDEC Breeding Bird Atlas. Other birds were noted in winter during the Brooklyn Christmas Bird Count (2005-2006) and from New York State Avian Records Committee reports.
Sources: DEC 2007a, NYSARC 2000-2006, National Audubon Society 2005-2007, AKRF field observations on 19 December 2007.

Overall, the terrestrial habitats within the project site are relatively limited and would not be expected to support large breeding bird populations. The project site's proximity to substantial marsh and open water habitats, and its location along the Atlantic Flyway, does make it likely temporary stopover habitat for use by migratory birds, and overwintering habitat for transitory flocks of wintering birds.

Mammals

Mammals expected to occur within the project site include typical urban species adapted to human-dominated landscapes, including eastern gray squirrel and various other rodent species (i.e., house mouse, Norway rat, meadow vole), feral dogs and cats, resident and migratory bat species, eastern cottontail, raccoon, and Virginia opossum. Native Eastern gray squirrels were the only mammals observed during the site visit, although breeding populations of the above

species would be expected to be present within the project site, with the exception of migratory bat species (i.e., red bat, silver-haired bat, hoary bat).

Reptiles and Amphibians

According to the NYSDEC Herp Atlas Project (NYSDEC 1999) and a review of available habitat, it is possible that the project site represents limited habitat for species that live in sandy environments, including Fowler's toad (*Bufo fowleri*), brown snake (*Storeria dekayi*) and garter snake (*Thamnophis sirtalis*). With the exception of freshwater likely contributed by an infrastructure-related leak in a vacant lot in the south-central portion of the project site (the Block 7074), the project site has no freshwater depressions or waterways and therefore is not expected to offer suitable breeding habitat for reptiles and amphibians. Although the habitat adjacent to the project site is open sand in proximity to marine waters, the level of human use and disturbance on and adjacent to the project site makes it unsuitable for eastern diamondback terrapin (*Malaclemys terrapin*) nesting activity.

Insects

As the AKRF field observations were conducted in December, no insect species were observed, although the project site would be expected to support insect populations. The characteristics of insect communities are influenced by the presence of plants or plant communities, habitat complexity and microhabitat characteristics that result in subtle differences in biotic and physical conditions of the environment (Gullen and Cranston 2005). Due to the urbanized character of the project site and study area, and the relative lack of plant species coverage and variety, insect diversity is expected to be low. Although occasional use by common beneficial insects (i.e., bumblebees and honeybees) and/or highly visible migratory species (i.e., monarch [*Danaus plexippus*], mourning cloak [*Nymphalis antiopa*], red admiral [*Vanessa atalanta*], and question mark [*Polygonia interrogationis*] butterflies) is possible, it is likely that the majority of the insect species with the potential to occur at the project site would be common to open disturbed areas such as vacant lots, fields, railroad beds, and roadsides. Species known to occur within Kings County with the potential to occur at the project site include the common sootywing (*Pholisora catullus*), wild indigo duskywing (*Erynnis baptisiae)*, cabbage white (*Pieris rapae*), cecropia silkmoth (*Hyalophora cecropia*) (Opler 2006), and the common bumblebee (*Bombus impatiens*).

AQUATIC RESOURCES

SURFACE WATER RESOURCES WITHIN THE STUDY AREA

As discussed previously in Section B, "Methodology," of this chapter, the study area for aquatic resources includes the Lower New York Bay portion of the Harbor Estuary, Coney Island Creek, and Shell Bank Creek.

The average depth of the Lower New York Bay is 28 feet at MLW. Mean tidal range is from 4.6 to 4.9 feet with the spring tide ranging from 5.6 to 5.9 feet. Tidal currents range from 0.1 to 3.0 feet per second (fps) with the weakest currents occurring toward Staten Island (U.S. Army Corps of Engineers [USACE] 1999). Parts of Lower New York Bay, including the open-ocean waters and coastline areas, are considered marine habitat—open-ocean overlying the continental shelf and coastline exposed to the waves and currents of the open ocean—where hydrologic patterns are dictated mostly by the tidal cycle.

The depth of Coney Island Creek ranges from 0 to approximately 15 feet at MLW. Freshwater input to the creek originates from one CSO, ten stormwater outfalls, and possibly groundwater

(DEP 2007e). The creek receives nearly 290 million gallons per year of combined sewage through the CSO outfall and another 1,486 million gallons per year of urban stormwater (DEP 2007d). Dry weather overflows (DWO) from some of the outfalls also contributes freshwater to the creek. Saltwater inputs to the creek occur through tidal exchange with Lower New York Bay.

The following sections describe the existing water quality and aquatic resources of these surface waters.

WATER QUALITY

Water Quality Standards

Title 6 of the NYCRR Part 703 includes surface water standards for use classifications for New York State surface waters set forth by NYCRR Part 701. Waters within the vicinity of the rezoning area have two saline surface water use classifications: SB (i.e., Lower New York Bay and Shell Bank Creek) and I (i.e., Coney Island Creek). Best uses of Class SB waters are for secondary contact recreation and fishing. Water quality of SB waters should be suitable for fish propagation and survival. The best usages for Class I waters are as secondary contact recreation and fishing. Water quality should be suitable for fish propagation and survival. Class I waters are limited to fishing and boating uses only. **Table 10-3** shows water quality standards for fecal and total coliform, dissolved oxygen, and pH for SB and I waters. (There are no New York State standards for chlorophyll-*a* or water clarity.)

Table 10-3
New York State Water Quality Standards for Use Classifications SB and I

Parameter	SB	I
Fecal Coliform (per 100mL)	Monthly geometric mean shall not exceed ≤200 Colonies/100mL from 5 or more samples.	Monthly geometric mean shall not exceed ≤ 2,000 Colonies/100mL from 5 or more samples.
Total Coliform (per 100mL)	Monthly geometric mean shall not exceed ≤ 2,400 colonies/100 milliliters (mL) from 5 or more samples.	Monthly geometric mean shall not exceed ≤ 10,000 colonies/100 milliliters (mL) from 5 or more samples.
Dissolved Oxygen (DO) (mg/L)	≥5.0 mg/L	≥4.0 mg/L
pH	Normal range shall not be extended by more than 0.1 of a pH unit.	Normal range shall not be extended by more than 0.1 of a pH unit.
Sources: NYSDEC 1999.		

The City of New York has monitored New York Harbor water quality for over 90 years through the Harbor Survey Program currently implemented by DEP. DEP evaluates surface water quality in four designated regions: Inner Harbor Area, Upper East River-Western Long Island Sound, Lower Bay, and Jamaica Bay. Recent harbor surveys (DEP 2002a, 2004, 2007a) show that water quality within the Harbor Estuary has improved significantly since the 1970s, most likely as a result of measures adopted by the City. These measures include eliminating 99 percent of raw dry-weather sewage discharges, reducing illegal discharges, increasing the capture of wet-weather related floatables, and reducing the toxic metals loadings from industrial sources by 95 percent (DEP 2002a). The 2006 Interstate Environmental Commission (IEC) Annual Report also indicates that the year-round disinfection requirement for discharges to waters within its district (including the Harbor Estuary) has contributed significantly to water quality improvements since the requirement went into effect in 1986 (IEC 2007).

Although many improvements to water quality are underway, combined sewer overflows continue to be the single largest source of pathogens to the Harbor Estuary (DEP 2004a). With over 700 discharge points, untreated household and industrial waste is released into the City's surface waters during wet weather events due to an influx of stormwater into to WPCPs. As a result, many waters of the Harbor Estuary, particularly dead-end tributaries, are not meeting NYS water quality standards for coliform and Dissolved Oxygen (DO). The high exchange of ocean water in Lower New York Harbor reduces residence time of pollutants, allowing for secondary contact recreation and a use designation of SB.

Temperature and salinity influence several physical and biological processes that occur within the water column. Temperature has an effect on the spatial and seasonal distribution of aquatic species and affects oxygen solubility, respiration, and other temperature-dependent water column and sediment biological and chemical processes. Salinity fluctuates in response to tides and freshwater discharges. Salinity and temperature largely determine water density and can affect vertical stratification of the water column. At the same time, saltwater holds less DO than freshwater at the same temperature. For this reason, low DO concentrations can often be correlated with high salinity levels in the Harbor Estuary (DEP 2004a). Salinity is also an important habitat variable, as most aquatic species have salinity tolerances within particular ranges.

Salinity concentrations are often greater than 30 parts per thousand (ppt) with little or no dilution except at the boundaries of estuarine waters (USACE 1999). Salinity measurements collected in the Lower New York Bay at DEP Station N-9 station located off of Steeplechase Pier adjacent to the project site between 1995 and 2006 ranged from 19 to 34 ppt, with bottom water salinity only slightly greater than surface water salinity. Saline bottom waters tend to be somewhat warmer than the less saline surface waters during the winter months, with the opposite being true during the summer.

Coliform bacteria inhabit the intestines of humans, as well as other warm-blooded animals, and are thus commonly used as indicators of unsanitary water conditions. Waters contaminated with fecal material will have high numbers of coliform bacteria, which also indicate the presence of disease-causing organisms. In the 1970s, coliform bacteria counts in the Harbor Estuary were well above 2,000 cells/100mL on a regular basis. However, improvements related to sewage treatment infrastructure brought about reductions in overall total and fecal coliform concentrations in the Harbor Estuary. Although reductions in coliform bacteria have been made, wet weather CSOs continue to discharge high counts into the water column periodically. Coliform bacteria are measured as total and fecal organisms. The NYSDEC standards for total and fecal coliform are based on the collection of a minimum of five samples per month and are to be met year-round. When assessing water quality conditions, coliform concentrations that exceed state standards reflect degraded water conditions.

DO in the water column is necessary for respiration by all aerobic forms of life, including fish, invertebrates such as crabs and clams, and zooplankton. The bacterial breakdown of high organic loads from various sources can deplete DO to low levels. This biological process is the primary cause of low oxygen concentrations in polluted waters; worst-case conditions usually occur during the summer months, when water temperatures rise. As water temperatures rise, the solubility of oxygen decreases and the metabolic rates of bacteria increase, requiring more oxygen for respiratory purposes. Consequently, bacteria may utilize existing oxygen faster than it can be replenished by either photosynthesis or diffusion from the atmosphere. Persistently low DO can degrade habitat and cause a variety of sublethal or, in extreme cases, lethal effects. Consequently, DO is one of the most universal indicators of overall water quality in aquatic

systems. Oxygen concentrations in coastal waters depend on a variety of interrelated chemical, physical, and biological factors, such as salinity, temperature, photosynthesis, and respiration.

High levels of nutrients can lead to excessive plant growth (a sign of eutrophication) and depletion of DO. Concentrations of the plant pigment chlorophyll-*a* in water can be used to estimate productivity and the abundance of phytoplankton. Chlorophyll-*a* concentrations greater than 20 micrograms per liter (µg/L) are considered suggestive of eutrophic conditions.

Secchi transparency is a measure of the clarity of surface waters. Transparency greater than 5 feet (1.5 meters) indicates relatively clear water. Decreased clarity can be caused by high suspended solid concentrations or blooms of plankton. Secchi transparencies less than 3 feet (0.9 meters) may be considered indicative of poor water quality conditions.

Water Quality Conditions

Lower New York Bay

Salinity concentrations in Lower New York Bay are often greater than 30 ppt with little or no dilution except at the boundaries of estuarine waters (USACE 1999). Salinity measurements collected in the Lower New York Bay at Station N-9 between 1995 and 2006 had a range of 19 to 34 ppt, with bottom water salinity only slightly greater than surface water salinity. Saline bottom waters tend to be somewhat warmer than the less saline surface waters during the winter months, with the opposite being true during the summer. Temperatures in the Lower New York Bay measured near the rezoning area between 1995 and 2006 ranged from approximately 1.8 to 24.7°C (35 to 76°F) (DEP 1996-2001, 2002b, 2003, 2004b, 2005, 2006, 2007b). Temperatures at station N-9 in 2006 were consistent with Lower New York Bay conditions ranging from 3.9 to 23.7°C (39.0 to 74.6°F).

Table 10-4 provides a summary of water quality conditions for the 2006 monitoring season. Data records from station N-9 between the months of February and December 2006 indicate that the water quality adjacent to the project site was well above state standards. According to the 2006 New York Harbor Water Quality Report (DEP 2007a), the five sampling stations within Lower New York Bay had geometric means less than 20 colonies/100mL fecal coliform, surpassing water quality standards of 200 colonies/100 mL. These results follow the trend within the Harbor Estuary, where fecal coliform levels have declined dramatically since the 1970s when concentrations were above 2,000 colonies/100 mL (DEP 2007a). In addition, since the 1970s average DO concentrations have increased from 6.1 mg/L to 7.9 mg/L in surface waters and from 5.2 mg/L to 7.4 mg/L in bottom waters (DEP 2007a). Eutrophic conditions occurred only on one occasion during the 2006 survey season (DEP 2007b). All pH levels in Lower New York Bay were in attainment.

Table 10-4
2006 DEP Water Quality Data for the Brooklyn N-9 Station, Lower New York Harbor

Parameter	Top Waters			Bottom Waters		
	Low	High	Mean	Low	High	Mean
Fecal Coliform (per 100 mL)	1.0	240.0	27	NM		
Dissolved Oxygen (mg/L)	5.6	11.7	8.1	5.3	11.9	7.9
Secchi Transparency (ft)	4.5	13.0	7.7	NM		
Chlorophyll-a (µg/L)	2.5	26.7	7.3	NM		

Notes: NM = Not measured; dissolved oxygen values are recorded for Winkler titration method; N=23.
Source: DEP 2007b.

Coney Island Creek

Average surface water temperatures in Coney Island Creek ranged from 23.0 to 23.5°C (73.4 to 74.3°F) during the sampling period; comparable to Lower New York Bay temperatures at Station N-9. Average salinity concentrations ranged from 12.9 to 22.8 ppt. This wide salinity gradient was to be expected given the freshwater sources located at the head of the creek and the structure of the sampling schedule. Freshwater sources contribute to an overall lower salinity value in Coney Island Creek compared to the waters of Station N-9 in Lower New York Bay.

Coney Island Creek receives nearly 290 million gallons per year of combined sewage through the CSO outfall and another 1,486 million gallons per year of urban stormwater (DEP 2007c). Evidence also suggests that DWO from some or all of the outfalls also contributes freshwater to the creek. Saltwater inputs to the creek occur through tidal exchange with Lower New York Bay.

Water quality data available for Coney Island Creek originate from a one-month sampling effort that produced an extensive dataset. As shown in **Figure 10-6**, eight stations were monitored from the upper reaches of the creek to the outlet at the Lower New York Bay. Two wet-weather surveys were conducted, with three runs per day and three days per survey, and two one-day dry-weather surveys were conducted, with one to three runs per day (DEP 2007d). Parameters measured included temperature, salinity, pH, fecal coliform, DO, BOD^5, and chlorophyll-a, among others. **Table 10-5** indicates water quality conditions between the months of August and September 2004.

Table 10-5
Mean Water Quality Data for Coney Island Creek Stations 1-8

Station	Temperature (°C)	Salinity (ppt)	pH	DO (mg/L)	BOD^5 (mg/L)	Chlorophyll-a (µg/L)	Fecal Coliform (per 100 mL)
1	23.5	12.9	7.4	2.9	3.7	21.4	27,950.0
2	23.5	16.0	7.5	3.6	4.6	34.7	17,442.1
3	23.4	16.2	7.4	3.4	4.0	31.6	35,914.7
4 Surface	23.1	18.1	7.5	3.8	4.1	28.2	38,401.6
4 Bottom	23.1	19.9	7.6	2.7	4.1	16.5	18,940.0
5 Surface	23.1	17.9	7.5	4.1	4.0	28.8	48,646.8
5 Bottom	23.0	19.9	7.5	3.0	4.3	11.8	20,893.3
6 Surface	23.2	19.4	7.6	6.0	4.1	20.4	13,475.3
6 Bottom	22.9	21.6	7.4	3.1	3.6	6.1	4,211.6
7 Surface	23.1	20.1	7.9	6.5	4.1	19.0	9,163.2
7 Bottom	22.8	22.2	7.7	3.6	3.6	8.6	3,592.6
8 Surface	23.0	20.2	7.9	6.7	3.6	10.2	2,130.5
8 Bottom	22.6	22.8	7.8	5.7	3.8	6.9	539.2

Notes: Surface sample depth 2 feet for all stations; bottom sample depth range 4 to 30 feet MLW. Dry weather N=<4; wet weather N=<15. August-September 2004.
Source: Hydroqual 2004.

These sampling results indicate that DO concentrations in the creek did not consistently meet Use Class I standards during the sampling period. Mean DO concentrations were in violation of state standards most of the time during wet-weather events; with hypoxic conditions observed at stations 1, 2, and 3 (located at the head of the creek) at all times. Mean DO levels were in attainment at all stations during dry weather, however, super-saturated DO concentrations were noted, suggesting that photosynthetic activity associated with algae production, indicated by

1.14.09

Source: New York City Department of Environmental Protection 2007

1 *Water Quality Sampling Station*

0 1000 FEET

SCALE

Coney Island Creek Water Quality Sampling Stations

Figure 10-6

elevated mean chlorophyll-a concentrations, impacted DO levels at the time of sampling. Mean chlorophyll-a concentrations sampled in surface waters at all stations were indicative of eutrophic conditions during dry-weather. Chlorophyll-a concentrations were lower during wet weather, possibly due to flushing that occurs during CSOs and storm sewer overflows (NYCDEP 2007d).

Mean fecal coliform levels met Use Class I standards at Stations 6, 7, and 8 (located at the mouth of Coney Island Creek) some of the time. However, both dry-weather and wet-weather mean fecal coliform data collected from the inner stations indicate that water quality in Coney Island Creek is severely impaired. Samples produced fecal coliform bacteria levels as high as 88,000 colonies/100 mg/L during wet-weather sampling. In addition, high (110,000 colonies/100 mg/L) dry-weather fecal coliform levels infer that improper connections to the sewer system exist (NYCDEP 2007d). Mean fecal coliform data suggest that CSOs, stormwater discharges, and dry weather sanitary flow have a significant impact on the receiving waters and sediment quality of the creek (AKRF 2005). NYSDEC DO and coliform bacteria standards were consistently violated during the sampling period under both dry- and wet-weather conditions in the middle and upper portions of the creek. The configuration of the creek, particularly at the head waters, contributes to poor water quality by restricting the water exchange with Lower New York Bay (DEP 2007c). For this reason, impacts on water quality are limited to the creek itself and do not appear to affect the water quality of Lower New York Bay.

Coney Island Creek is identified on New York State's Final 2007 Section 303(d) list of impaired waters (DEC 2007b). The 303(d) list identifies waters that do not support appropriate uses. This list requires development of a Total Maximum Daily Load (TMDL) for pollutants or other restoration strategies to reduce the input of the specific pollutant(s) that restrict water body uses and to restore and protect such uses. Coney Island Creek requires TMDL development for DO, DO demand, and pathogens that have originated from urban, CSO, and municipal sources. Although the Final 2007 Section 303 (d) list of impaired waters notes pathogens in Coney Island Creek as a purpose for impairment, TMDL measures are no longer required because other control measures, resulting from the 2005 Consent Order signed by NYSDEC and the City of New York, are expected to address the problem (NYSDEC 2008).

The 2005 Consent Order directs the City to develop and implement watershed and facility plans to address CSO discharges and bring waters into compliance with the CWA (DEP 2007d). The Coney Island Creek Waterbody/Watershed Facility Plan includes the rehabilitation and upgrade of Avenue V Pumping Station capacity from 30 million gallons per day (mgd) to 80 mgd to reduce CSOs to Coney Island Creek, and the construction of two new force mains, one for dry-weather flow and a second for wet-weather flow. With these measures in place, DO criteria are projected to meet state standards at least 85 percent of the time. For pathogens, the plan estimates that total and fecal coliform criteria will be met 92 percent and 67 percent of the time respectively (DEP 2007d). The draft Coney Island Creek Waterbody/Watershed Facility Plan was submitted to NYSDEC in June 2007.

Shell Bank Creek

Limited water quality data are available for Shell Bank Creek. The two closest Harbor Survey stations (J1 and J11) are located at Rockaway Inlet and Sheepshead Bay respectively, where water exchange between Shell Bank Creek occurs via Plumb Beach Channel. Furthermore, tidal exchange between Gerristen Creek, located to the west of Shell Bank Creek, is likely to occur, since both waterbodies share the same outlet.

SEDIMENT QUALITY

Sediments in the Harbor Estuary often contain evidence of contamination. A 1998 survey found that the mean sediment contaminant concentration in the Harbor Estuary was statistically higher than other coastal areas of the East Coast for 50 of the 59 chemicals measured (Adams et al. 1998), and Newark and Jamaica bays have been ranked highest in the Harbor Estuary for the most toxic sediments on the basis of sediment chemistry, toxicity, and benthic community (Adams and Benyi, 2003). Biological effects, measured by relative impacts on the benthic invertebrate community, were found to be associated with the chemical contamination. While the sediments of the Harbor Estuary are contaminated, the levels of contaminants (e.g., dioxin, DDT, and mercury) have decreased on average over the past 30 years (Steinberg et al. 2002). Between 1993 and 1998, the percentage of sediment samplings with benthic macroinvertebrate communities considered impacted or of degraded quality, decreased throughout the Harbor Estuary (Steinberg et al. 2004). Sediments of Lower New York Bay and Shell Bank Creek are expected to resemble the overall sediment conditions within the Harbor Estuary.

Although sediment quality in the Harbor Estuary appears to be improving, pockets of highly contaminated sediment persist, particularly in areas that have a history of contamination and experience less water exchange with open waters. As part of a 1993 Coney Island Creek CSO Facility Planning Project, sediment samples were collected from eight stations for analysis of USEPA-designated priority pollutants. Eleven of the 13 priority pollutant metals, 11 priority pollutant organic compounds, (10 of which were semi-volatile, consisting of polynuclear aromatic hydrocarbons [PAHs]), and two pesticides were detected in the sediments of the creek. The most likely sources of PAHs originate from sewage and industrial effluents, petroleum spills, combustion of fossil fuels, urban runoff, atmospheric deposition, and groundwater (NYCDEP 2007d). Although heavy metals are widespread throughout the creek, the distribution of organic pollutants is limited to the inner portions of the creek, suggesting that CSOs and stormwater outfalls contribute to the majority of the pollutant loads.

AQUATIC BIOTA

Aquatic resources of the Harbor Estuary in the vicinity of the project site include estuarine and marine habitats ranging from very shallow intertidal mudflats and salt marshes to naturally occurring deep-water areas and maintained deep channels. The following sections describe the aquatic biota expected to occur in the waters of Lower New York Bay and Coney Island Creek.

Primary Producers

Phytoplankton are microscopic plants whose movements within the system are largely governed by prevailing tides and currents. Light penetration, turbidity, and nutrient concentrations are important factors in determining phytoplankton productivity and biomass. Diatoms such as *Skeletonema costatum* and *Thalassiosira* spp. generally dominate the phytoplankton community, with lesser contributions from dinoflagellates and green algae (Brosnan and O'Shea 1995). While nutrient concentrations in most areas of the Harbor Estuary are very high, low light penetration has often precluded the occurrence of phytoplankton blooms. A study conducted in 1993 found a total of 40 phytoplankton taxa in Coney Island Creek. Similar to the rest of the Harbor Estuary, diatoms were the dominant class of phytoplankton. Dinoflagellates and chryptophytes were also common. The species collected in the greatest concentrations were *Skeletonema costatum*, *Asterionella japonica* (diatom), C*hroomonas* sp. (cryptophte), *Cryptomonas* sp. (cryptophyte), A*mphidinium* sp. (dinoflagellate), and *Rhizosolenia fragilissima*

(diatom). In addition, three toxic species of dinoflagellates were collected from Coney Island Creek: *Prorocentrum micans* and *Dinophysis norvegica*, associated with diarrhetic shellfish, and *Prorocentrum minimum*, associated with toxic shellfish poisoning (NYCDEP 2007d).

Limited light penetration also restricts the distribution of submerged aquatic vegetation (SAV) in the Harbor Estuary. Benthic macroalgae are large multicellular algae that are important primary producers in the aquatic environment. Species of macroalgae that occur in the Harbor Estuary include sea lettuce, green fleece, and brown algae (*Fucus* spp.) (PBS&J 1998). These species are expected to occur in waters within the vicinity of the project site.

Zooplankton

Zooplankton are an integral component of aquatic food webs. They are primary grazers on phytoplankton and detritus material and provide a major food source for fish. Crustacean taxa are the most abundant group of zooplankton collected throughout the Harbor Estuary. The most dominant species include the copepods (*Acartia tonsa, Acartia hudsonica, Eurytemora affinis,* and *Temora longicornis*), with each species being prevalent in certain seasons (Stepien et al. 1981, Lonsdale and Cosper 1994, Perlmutter 1971, Lauer 1971, Hazen and Sawyer 1983). In Coney Island Creek, a total of 20 zooplankton taxa are known to be present, including copepods *Acartia tonsa* and *Acartia hudsonia*. However, Polychaete larvae, barnacle nauplii, *Cladocerans* sp. and the copepod *Tortanus discaudatus* are the most dominant species (NYCDEP 2007d). These zooplankton taxa found in the Harbor Estuary and Coney Island Creek are expected to be present in Lower New York Bay and Shell Bank Creek.

Benthic Invertebrates

Benthic invertebrates inhabit the sediments and surfaces of submerged objects such as rocks, pilings, or debris. They are important to the energy flow of aquatic systems because they consume detrital and suspended organic matter and, in turn, are an important food source for fish and waterfowl. Benthic invertebrates include organisms that are retained on a 0.5 millimeter (mm) screen (macroinvertebrates) and smaller forms (nematodes and harpacticoid copepods). Some of these animals live on top of the substratum (epifauna) and some within the substratum (infauna). Substrate type (rocks, pilings, sediment grain size, etc.) are the primary factors influencing benthic invertebrate communities. Secondary factors include currents, wave action, predation, succession, and disturbance.

The major groups of benthic invertebrates collected in the Harbor Estuary include aquatic earthworms (oligochaetes), segmented worms (polychaetes), snails (gastropods), bivalves, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (EEA 1988, EA Engineering Science and Technology 1990, Coastal 1987, and PBS&J 1998). A 2003 study of Lower New York Bay (in the vicinity of the study area), Coney Island Creek, and Sheepshead Bay found that nematodes and annelids (Oligochaetes, *Streblospio benedicti)* dominate the benthic invertebrate community. Copepods were observed in Coney Island Creek, but not in the Lower New York Bay and Sheepshead Bay. Mollusks (*Nucula proxima* and *Crepidula plana*) were observed in substantial numbers in Sheepshead Bay and Lower New York Bay. The greater species diversity observed in Sheepshead Bay (17 taxa) than the Lower Bay (23 taxa) is likely due to higher water exchange occurring within the bays (DEP 2007c).

The wide range of bottom habitats within the Harbor Estuary supports many species of shellfish and crustaceans, many of which have commercial value. These include, but are not limited to, the blue mussel (*Mytilus edulis*), northern quahog (*Mercenaria mercenaria*), softshell clam (*Mya*

arenaria), American oyster (*Crassostrea virginica*), the blue crab (*Callinectes sapidus*), and the horseshoe crab (*Limulus polyphemus*). These species utilize a wide range of habitats, from hard surfaces such as pier structures, used by mussels, to sand or mud substrates more suited for blue crabs. Stone outcroppings, pier structures, and sand and mud substrates within Lower New York Bay near the project site offer habitat for many of these organisms. The shoreline of Coney Island Creek consists of fill materials, riprap, and wooden or concrete bulkheads, which provide substrates that can support this epibenthic community. In a 2001 study, nine taxa were identified, including common sea grape (*Molgula manhattensis*), blue mussels, barnacles, crabs, polychaetes, bryozoans, and cnidarians (DEP 2007c).

Fish

The Harbor Estuary supports significant habitat—including spawning ground, migratory pathway, nursery, and foraging areas—for a diverse population of marine, estuarine, anadromous, and catadromous fish species (USACE 1999). Over 101 fish have been sighted in the Harbor Estuary (USFWS 1997). A 1991 study showed that marine species comprise the majority (70 percent) of the population with the highest diversity being in the waters with the highest salinities (USFWS 1997), such as Lower New York Bay. Common marine species occurring throughout the Harbor Estuary include red hake (*Urophycis chuss*), weakfish (*Cynoscion regalis*), windowpane (*Scophthalmus aquosus*), and winter flounder (*Pleuronectes americanus*). Estuarine species amount to approximately 10 percent of the population and tend to occur in waters with lower salinity concentrations (USFWS 1997). Widespread estuarine species consist of resident mummichog (*Fundulus heteroclitus*), hogchoker (*Trinectes macalatus*), bay anchovy, and white perch populations; these species were found in the 1991 study to be the most abundant (USFWS 1997). Important recreational fish species include, but are not limited to weakfish (*Cynoscion regalis*), bluefish (*Pomatomus saltatrix*), scup (*Stenotomus chrysops*), striped bass, and winter flounder (USFWS 1997).

Lower New York Bay supports significant habitat for shellfish and the marine, estuarine, and anadromous fish species mentioned above. Situated in the transition zone where northeast and southeast Atlantic waters meet, Lower New York Bay provides habitat for both cold and warm-water species. As a result, over 90 species of fish have been recorded for Lower New York Bay. Year-round residents include silversides, killifish, white perch, and bay anchovies (USACE 2004). Many of these species are important prey items for seasonally abundant piscivorous fish (e.g., blue fish, striped bass). Adult and juvenile bluefish, scup, weakfish, winter flounder, and red hake depend on Lower New York Bay during different portions of their life histories. As part of a CSO Facility Planning study conducted in 1994, nine species of fish were collected in Lower New York Bay near Coney Island Creek, and three species in the creek itself, including northern kingfish, striped bass, and Atlantic silverside. A 2001 ichthyoplankton study within Lower New York Bay identified 15 taxa of fish eggs and larvae in the near-shore area of Lower New York Bay and 14 taxa within Coney Island Creek. Abundant species included bay anchovy, and winter flounder and windowpane larvae (DEP 2007d).

Aquatic Mammals

Seventeen species of marine mammals have been observed in the Harbor Estuary or in the immediate vicinity offshore. The harbor seal (*Phoca vitulina*), grey seal (*Halichoerus grypus*), and bottlenosed dolphin (*Tursiops truncates*) are known to occur in Lower New York Bay (USACE 1999). The harbor seal is the most common seal species in the region. Although harbor seals are often resident species of the Harbor Estuary, they are most abundant between

November and May. There are 25 major haul-out sites in the region, some of which occur in Lower New York Bay. Harbor seals feed on herring, mackerel, squid, flounder, green crabs, mussels, cod, and whiting. Grey seal pups and juveniles are occasional transient visitors to the Harbor Estuary, generally between the months of January and April (USACE 1999). Bottlenose dolphin are also occasionally observed in inshore waters (USFWS 1997). The occasional sighting of cetaceans in the Harbor is generally associated with individuals that are likely to be unhealthy and/or lost (USACE 1999). Six federally endangered or threatened aquatic mammals known to occur in the area are described in greater detail in the Threatened, Endangered, and Rare Species discussion. These species include blue whale, finback whale, humpback whale, northern right whale, sei whale, and sperm whale (USACE 1999).

THREATENED, ENDANGERED SPECIES, OR SPECIAL CONCERN SPECIES

Requests for information on rare, threatened, or endangered species within the immediate vicinity of the rezoning area were submitted to USFWS, NYNHP, and NMFS. NYNHP had no records of rare or state-listed wildlife or plant species, significant natural communities, or other significant habitats on or within the vicinity of the project site (Seoane 2008). Although not indicated in NYNHP correspondence, the state endangered peregrine falcon (*Falco peregrinus*), which occurs within New York City year-round, has the potential to occur within the project site (DEP undated). The Kings County list of federally endangered, threatened, and candidate species (USFWS 2007) indicated two federally threatened species (piping plover [*Charadrius melodus*] and seabeach amaranth [*Amaranthus pumilus*]) and two federally endangered species (roseate tern [*Sterna dougalli dougallii*] and shortnose sturgeon [*Acipenser brevirostrum*]) known to occur in Brooklyn. NMFS identified the endangered shortnose sturgeon, Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and four sea turtle species—the federally threatened loggerhead (*Caretta caretta*) and federally endangered Kemp's ridley (*Lepidochelys kempi*), green (*Chelonia mydas*), and leatherback (*Dermonchelys coriacea*)—as potentially occurring within the vicinity of the project site (Colligan 2007).

Three federally listed terrestrial species (piping plover, seabeach amaranth, and roseate tern) have been recorded in sand beach and maritime dune habitats in Queens, though they would not be expected to breed at the project site due to its high level of recreational use. Piping plover and roseate tern do have the potential to forage within the sand beach habitat present to the south of the project site. Shortnose sturgeon, however, could potentially occur in the vicinity of the project site, and is discussed in more detail below.

Seabeach amaranth

Seabeach amaranth is an annual plant that germinates between June and July and reaches maturity between the months of August and September. At maturity, plants can spread up to one meter in diameter, with seeds producing at its peak in September. The plant continues to grow and bloom until late November in the New York region. Seabeach amaranth habitat consists of dynamic barrier beach landscapes, where there is low competition from other plants, as it is intolerant of vegetative competition. The plant often colonizes areas on accreting shorelines, upper beach, foredune, overwash flats and sand/shell beach replenishment, and dredge spoil. The plant has been found growing around bays of Long Island Sound, suggesting that it is an adaptive species. Seabeach amaranth shares habitat with other endangered species, including piping plovers and roseate terns (USFWS undated).

Seabeach amaranth is not known to occur in beach areas near the project site. The limited amount of maritime dune habitat located in vacant lots in the project site is vegetated and does not provide suitable habitat for seabeach amaranth.

Piping plover

Piping plover are federally listed threatened and state-listed endangered shorebirds that arrive to breeding grounds in coastal areas in mid-March in New York State. Breeding habitat consists of dry sandy beaches or areas that have been filled with dredged sand, often near dunes in areas with little or no beach grass. Three populations of piping plovers currently exist: one along the east coast, another on the upper Great Lakes, and a third on the major river systems and wetlands of the northern Great Plains. In New York, breeding occurs on Long Island's sandy beaches, from Queens east to the Hamptons, particularly in the eastern bays and harbors of northern Suffolk County. In the New York City area, piping plover and least tern breed and nest in a protected area on Rockaway Beach opposite Jamaica Bay (DEC undated[a]). The disturbed conditions of the vacant lots and limited fragments of maritime dune habitat within the project site do not provide suitable habitat for the piping plover.

Roseate tern

Roseate tern is a federally threatened and New York State endangered species that arrives to breeding grounds in late April or early May and begins nesting one month later. Nests typically consist of a simple depression in sand, shell, or gravel, lined with bits of grass and other debris situated in dense grass clumps, under boulders, or in rip-rap. In New York State, roseate terns are always found nesting within larger colonies of common terns. Roseate terns feed on American sand lance—a small fish of estuarine, open-coastal, and offshore habitats that are an important prey species of many marine fishes and mammals. In New York, the roseate tern breeds primarily at a small number of Long Island colonies, the largest located at the eastern end of Long Island (NYSDEC undated[b]). The sand beach habitats at and adjacent to the project site are frequently disturbed (i.e., foot traffic, beach maintenance, etc.), and support populations of mammalian predators such as feral cats and racoons; as a result, it is unlikely that nesting populations of colonial waterbirds, including common and roseate terns would find available habitat on the project site.

Peregrine Falcon

Peregrine falcons nest on ledges and small shallow caves on high cliff walls, man-made platforms, or in urban areas on bridges and tall buildings. In the New York City area, courtship occurs in February and March, with egg laying in April and May. Peregrine falcons typically return to the same nest every year; in the New York City area, nesting occurs almost exclusively on bridges, buildings, and other man-made structures.

During the AKRF field observations on 19 December 2007, an adult peregrine falcon was observed on top of the non-operational Parachute Jump on the southern edge of the project site. As this individual was observed in the non-breeding season, the observation does not offer information on breeding status; no nesting attempts have been recorded for this site. However, the Parachute Jump is consistent with the type of nesting structure preferred by nesting peregrine falcons in urban areas.

Short-nosed sturgeon

The federally and state-listed-endangered shortnose sturgeon is a semi-anadromous bottom-feeding fish that can be found throughout the Hudson River system. These fish spawn, develop, and overwinter in the mid-Hudson River well up-estuary of the project site (NYSDEC undated[c]). Shortnose sturgeons spend most of their lives in the estuary and prefer colder, deeper waters for all life stages.

Although larvae can be found in brackish areas of the Hudson River, the juveniles (fish ranging from 2 to 8 years old) are predominately confined to freshwater reaches above the downstream saline area. The primary summer habitat for shortnose sturgeon in the middle section of the Hudson River is the deep river channel (13 to 42 m deep, 43 to 138 feet). The river channel downstream of this middle estuary area is 18 to 48 m deep (59 to 157 feet [Peterson and Bain 2002]). The Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 2004).

Shortnose sturgeons have been reported near Staten Island, and near the confluence of the East River and the Upper Bay. Additionally, two individuals tagged in the Hudson River have been recaptured in the Connecticut River. It is unknown whether these individuals traveled through the East River and into Long Island Sound, or exited the Lower Bay into the Atlantic Ocean and then traveled north along the southern coast of Long Island and into Long Island Sound. The Lower Bay is not considered to be a high use area for shortnose sturgeon, and there have been no documented captures of this species from within this area (Colligan 2007). Individuals are only expected to occur in the vicinity of the project site as transient individuals while traveling to or from Hudson River spawning, nursery, and overwintering areas.

Atlantic sturgeon

The Atlantic sturgeon, an NMFS candidate species, is also known to occur in the Hudson River and surrounding coastal waters. It is a large, anadromous, bottom-feeding species that spawns in the Hudson River and matures in marine waters; females return to spawn at 18 years, males earlier (Bain 1997). In the Hudson River, Atlantic sturgeon are found in the deeper portions and do not occur farther upstream than Hudson, New York. Atlantic sturgeons migrate from the ocean upriver to spawn above the salt front from April to early July (Smith 1985, Stegemann 1999). Individuals are likely to occur off of southern Long Island, although not in high numbers (Colligan 2007). Juveniles may use the East River to migrate from the Hudson River to Long Island Sound (Savoy and Pacileo 2003). Their diet consists largely of benthic organisms (including worms and amphipods), plants, and small fish (Bain 1997). Overfishing, reduction of key spawning areas, and pollution have been suggested as reasons for the range-wide decline of this species (Smith 1985, Bain 2004). Individuals are only expected to occur in the vicinity of the project site as transient individuals while traveling to or from Hudson River spawning, nursery, and overwintering areas.

Sea turtles

Little is known about the distribution of sea turtles throughout the Harbor Estuary. However, studies do show that sea turtles occur in slow moving waters (less than 2 knots) in areas where the depth is between 5 and 16 meters (Colligan 2007). Four species of marine turtles, all state- and federally listed, can be found seasonally in New York waters typically between May 1 and November 30, when the waters are warm. Marine turtle occurrences in the Harbor Estuary are typically as small juveniles. Federally endangered Kemp's ridley (*Lepidochelys kempii*) and federally threatened loggerhead (*Caretta caretta*) turtles regularly enter the Harbor Estuary and

are the most abundant marine turtles. At times, waters of the Harbor Estuary have been warm enough to support the green sea turtle (*Chelonia mydas*). Leatherback sea turtles (*Dermochelys coriacea*) are usually restricted to warmer waters with higher salinity levels offshore, and would less likely be found inshore (USFWS 1997, Colligan 2007). Nesting sites for terrapins are typically in sandy habitats with sparse or moderate vegetation cover (USFWS 1997). Occurrences of sea turtles in Lower New York Bay are rare (Colligan 2007), but loggerhead turtles and ridley sea turtles have been recorded near Sandy Hook (USFWS 1997).

In the Harbor Estuary, the estuarine northern diamondback terrapin is more frequently sighted. The northern diamondback terrapin is a diurnal species of estuarine areas, brackish waters of coastal rivers and creeks, salt marshes, and tidal flats (Conant and Collins 1998). It occurs in the Harbor Estuary mainly in salt marshes where it nests and feeds on fish, crustaceans, mollusks, and insects (USFWS 1997). Although the habitat adjacent to the project site is open sand in proximity to marine waters, the level of human use and disturbance on and adjacent to the project site makes it unsuitable for eastern diamondback terrapin (*Malaclemys terrapin*) nesting activity.

Marine Mammals

Historic records indicate the harbor porpoise (*Phocoena phocoena*) may have once been a regular visitor to New York/New Jersey Harbor (USFWS 1997). The North Atlantic right whale (*Eubalaena glacialis*) and the humpback whale (*Megaptera novaeanglia*) occur in the offshore waters of New York on a seasonal basis (Colligan 2007). North Atlantic right whales occur from November 1 to March 31 and humpback whales occur from February to April and September to November. Sightings of these species within New York/New Jersey Harbor are relatively rare (USFWS 1997). Although marine mammals are known to occur in the waters of the New York Bight, and occasionally come into New York/New Jersey Harbor, they are not commonly observed in the waters associated with the project site (Colligan 2007). Sightings include humpback whales feeding at the Lower Bay inlet and stranded sperm whales (USFWS 1997).

ESSENTIAL FISH HABITAT

As noted by NMFS (Tuxbury 2007), the project site is within a portion of the Harbor Estuary EFH that is situated in the National Oceanic and Atmospheric Association (NOAA)/NMFS 10’ x 10’ square having the coordinates (North) 40° 40.0' N, (East) 73° 50.0' W, (South) 40° 30.0' N, (West) 74° 00.0' W, which includes Atlantic Ocean waters affecting the following: western Rockaway Beach, western Jamaica Bay, Rockaway Inlet, Barren Island, Coney Island (except for Norton Point), Paerdegat Basin, Mill Basin, southwest of Howard Beach, Ruffle Bar, and many smaller islands. The area within this 10' x 10' square has been identified as EFH for 20 species of fish. **Table 10-6** lists the species and life stages of fish identified as having EFH within these coordinates.

Coney Island Creek is located directly to the west of the aforementioned location in a portion of the Harbor Estuary EFH that is situated in the NOAA/NMFS 10’ x 10’ square having the coordinates (North) 40° 40.0' N, (East) 74° 00.0' W, (South) 40° 30.0' N, (West) 74° 10.0' W. These coordinates cover the Atlantic Ocean waters affecting the following: Staten Island, from Port Richmond, NY on the north west around to Great Kills South Harbor of Great Kills, NY, south of Bayonne, NY. **Table 10-7** lists the 17 EFH species identified for these coordinates.

Table 10-6
Essential Fish Habitat Designated Species for the Lower New York Bay

Species	Eggs	Larvae	Juveniles	Adults
Whiting *(Merluccius bilinearis)*	X	X	X	
Red hake *(Urophycis chuss)*	X	X	X	
Winter flounder *(Pleuronectes americanus)*	X	X	X	X
Windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*			X	X
Monkfish *(Lophius americanus)*	X	X		
Bluefish *(Pomatomus saltatrix)*			X	X
Atlantic butterfish *(Peprilus triacanthus)*		X	X	X
Atlantic mackerel *(Scomber scombrus)*			X	X
Summer flounder *(Paralicthys dentatus)*		X	X	X
Scup *(Stenotomus chrysops)*	X	X	X	X
Black sea bass *(Centropristus striata)*	n/a		X	X
King mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
Cobia *(Rachycentron canadum)*	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata)*			X	X
Dusky shark *(Charcharinus obscurus)*		X[(1)]		
Sandbar shark *(Charcharinus plumbeus)*		X[(1)]	X	X

Notes:[(1)] Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger and sandbar sharks refers to neonates and early juveniles.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at: http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40307350.html

Table 10-7
Essential Fish Habitat Designated Species for Coney Island Creek Coordinates

Species	Eggs	Larvae	Juveniles	Adults
Red hake (Urophycis chuss)	X	X	X	
Winter flounder (Pleuronectes americanus)	X	X	X	X
Windowpane flounder (Scopthalmus aquosus)	X	X	X	X
Atlantic sea herring (Clupea harengus)		X	X	X
Atlantic butterfish (Peprilus triacanthus)		X	X	X
Atlantic mackerel (Scomber scombrus)			X	X
Summer flounder (Paralicthys dentatus)		X	X	X
Scup (Stenotomus chrysops)	X	X	X	X
King mackerel (Scomberomorus cavalla)	X	X	X	X
Spanish mackerel (Scomberomorus maculatus)	X	X	X	X
Cobia (Rachycentron canadum)	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata)*			X	X
Sand tiger shark (Odontaspis taurus)		X		
Dusky shark (Charcharinus obscurus)		X[(1)]	X	
Sandbar shark (Charcharinus plumbeus)		X[(1)]		X

Notes:[(1)] Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger and sandbar sharks refers to neonates and early juveniles.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the http://www.nero.noaa.gov/hcd/STATES4/new_jersey/40307400.html

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

As discussed in detail in Section B, "Methodology," in the future without the proposed actions no development is expected to occur in the Coney East and Coney West subdistricts. It is anticipated that the proposed rezoning area within Coney North would experience modest growth in residential and commercial uses in the future without the proposed actions. This growth would include residential and retail development that would reduce the amount of vacant land in this portion of the rezoning area by of 160,415 sf and result in an increase in commercial and residential uses.

GROUNDWATER

Because groundwater is not used as a potable water supply in this part of Brooklyn, the projected development (as-of-right) within the Coney North and Mermaid Avenue subdistricts would not have the potential to affect drinking water supplies. As discussed in Chapter 11, "Hazardous Materials," the hazardous materials assessment identified potential historical and present sources of contamination within the Coney North and Mermaid Avenue subdistricts. Often, to reduce the potential of adverse impacts associated with potential new construction within contaminated project sites, further environmental investigation would be required prior to development, by placing E-designations (for privately owned land) or Land Disposition Agreements (LDA), or Memoranda of Understanding (MOU) (for city-owned land). However, no E-designations, which require the owner of a property to assess potential hazardous material impacts prior to construction, currently exist on any portion of the rezoning area. Therefore, any subsurface disturbances would not necessarily be conducted in accordance with the procedures set forth by the regulations (e.g., for conducting testing before commencing excavation and implementation of health and safety plans during construction). However, should petroleum tanks and/or spills be identified on site, legal requirements (including those of NYSDEC) would be followed for off-site disposal of soil/fill. Similarly, state and federal requirements would be followed for the disturbance, handling, and disposal of suspect lead-based paint, asbestos-containing materials. As such, in the future without the proposed actions, the amount of soil disturbance would be less, but potentially the controls on its performance would not be as stringent as under the proposed actions, as described in the "Probable Impacts of the Proposed Actions" section below.

FLOODPLAINS

The Coney North and Mermaid Avenue subdistricts are within the 100-year floodplain. Construction of new structures within this portion of the project site would not exacerbate flooding conditions within this portion of Coney Island. New York City is affected by local (e.g., flooding of inland portions of the city from short-term, high-intensity rain events in areas with poor drainage), fluvial (e.g., rivers and streams overflowing their banks), and coastal flooding (e.g., long and short wave surges that affect the shores of the Atlantic Ocean, bays such as Upper New York Bay, and tidally influenced rivers such as the East River, streams and inlets [FEMA 2007]). The floodplain within and adjacent to the project site is affected by coastal flooding, which is influenced by astronomic tide and meteorological forces (e.g., northeasters and hurricanes [FEMA 2007]), and, therefore, would not be affected by projected development within this portion of the project site.

Any development that occurred within the project site would be consistent with the New York City Building Code (Title 27, Subchapter 4, Article 10) which requires that residential buildings

have a finished floor elevation (FFE) at or above the 100-year floodplain, and the FEMA requirement that the FFE to be one foot above the 100-year floodplain.

TERRESTRIAL RESOURCES

Because no development is expected to occur in the Coney East and Coney West subdistricts in the future without the proposed actions, terrestrial resources within these two portions of the project site would be unchanged. These two subdistricts comprise the majority of the habitat communities and associated wildlife described previously as occurring within the project site. KeySpan Park and associated parking lots would continue to serve for baseball games and other planned events. The amusements parks and associated parking lots would continue on a seasonal schedule, serving visitors to the Coney Island area. Within the urban vacant lot parcels, the natural succession may result in a greater proportion of woody vegetation, including species typical of disturbed conditions such as tree-of-heaven and cottonwood trees. Maritime dune habitat may also continue to expand into the vacant lots adjacent to Riegelmann Boardwalk. However, it should be noted that in this highly urban environment, natural succession could be affected by human disturbance. In addition, the project parcels have generally been used either for parking or have been maintained in a mowed condition. With the exception of the proposed 2.2-acre public park being developed by DPR and NYCEDC south of KeySpan Park (i.e., Steeplechase Plaza), the unpaved parcels would most likely remain an open landscaped area composed primarily of herbaceous species and invasive plants. Landscaping of the park would have the potential to enhance the wildlife habitat currently found within the project site.

As discussed in Section B, "Methodology," this growth would include residential and retail development that would reduce the amount of vacant land in this portion of the rezoning area by of 160,415 sf and result in an increase in commercial and residential uses. The urban vacant lot habitat present within this portion of the project site was un-vegetated or was more sparsely vegetated than those present within the Coney East and West subdistricts. The loss of urban vacant lot and urban structure exterior habitats within this portion of the project site would have the potential to adversely affect those wildlife individuals unable to find suitable habitat nearby. However, the species that occur within this area are, in general, common to urban settings. Therefore, while the projected development within the Coney North subdistrict by 2019 would adversely affect vegetation and wildlife currently present within this portion of the project site, the loss of this flora and fauna would not result in significant adverse impacts to these terrestrial resources on a regional scale. This portion of the project site does not provide habitat critical to maintaining populations of these species within the region.

WATER QUALITY, AQUATIC RESOURCES, AND WETLANDS

AS-OF-RIGHT DEVELOPMENT

Within the Coney North subdistrict and Mermaid Avenue subdistrict by the 2019 analysis year, projected as-of-right development would result in a reduction of vacant land by 160,415 sf (from 457,376 sf to 296,961 sf), and an increase in commercial uses by 92,351 sf (from 143,853 to 236,204 sf), residential use by 92,351 sf (from 14,429 to 627,469 sf), and 71,946 sf of community facilities (see Chapter 1, Table 1-2). As presented in Chapter 13, "Infrastructure," these as-of-right developments would result in an increased sanitary sewage discharge of approximately 245,323 gallons per day (gpd) (0.2 million gallons per day (mgd)) to the Coney Island WPCP over the existing condition. This minimal increase in sanitary sewage, combined with the highest DEP-projected flows for the Coney Island WPCP sewershed for the 2019

analysis year[1] of 90.0 mgd, would be well below the Coney Island WPCP SPDES permitted and design capacity of 110 mgd and would not be expected to adversely affect compliance of the WPCP effluent with the SPDES permit limits. Therefore, the projected flows for the 2019 No Build scenario would not result in significant adverse impacts to the water quality of Shell Bank Creek in the vicinity of the WPCP. Water quality of Shell Bank Creek would continue to meet the Use Class SB water quality standards.

The projected as-of-right developments within the Coney North subdistrict would not result in an increase in impervious surfaces within this portion of the project site. Stormwater runoff generated within this portion of the project site would continue to flow into the existing storm sewer system within the project site, discharging to Coney Island Creek. Stormwater runoff generated within the portion of the project site south of Surf Avenue would continue to be discharged to the Lower New York Harbor, and/or infiltrate into the subsurface in areas not covered by impervious surface. Stormwater runoff discharged to the separate DEP storm sewer would be treated to ensure compliance with NYSDEC standards, including the SPDES General Permit For Construction Activity GP-0-08-001 requirements for the development of a stormwater pollution prevention plan (SWPPP), that would include post-construction stormwater management practices. DEP would also review the SWPPP for consistency with DEP requirements related to sizing stormwater management controls based on the 10-year storm event, and DEP requirements for stormwater detention in compliance with the drainage plan for developments fronting on streets with sewers, if the developed site's storm flow exceeds the allowable flow of the drainage plan.

Therefore, it is expected that in the future without the proposed actions, new developments disturbing an acre or more of land surface within the Coney North and Mermaid Avenue subdistricts would be required to incorporate stormwater best management practices (BMPs) to regulate the quality and rate at which stormwater is discharged from the development site to the DEP storm sewer that discharges to Coney Island Creek. Developments less than an acre would still be required to follow DEP site connection requirements to discharge stormwater to the DEP storm sewer. Implementation of these measures would improve the quality of stormwater and reduce the rate of discharge of to Coney Island Creek, which could improve water quality of Coney Island Creek during and after precipitation events.

OTHER PROJECTS

Proposed and ongoing projects aimed at improving water quality and aquatic resources in the New York/New Jersey Harbor Estuary have the potential to improve water quality and aquatic habitat in the Lower New York Harbor and Coney Island Creek near the project site. As described below, these projects are independent of the proposed actions and the resulting improvements to water quality and aquatic resources will occur without the proposed actions.

New York/New Jersey Harbor Estuary Program Projects

The HEP Final Comprehensive Conservation and Management Plan (CCMP) included a number of goals to improve water quality and aquatic resources throughout the Harbor Estuary. To meet these goals, the CCMP outlines objectives for the management of toxic contamination, dredged material, pathogenic contamination, floatable debris, nutrients and organic enrichment, and rainfall-induced discharges. Most of these objectives aim to increase knowledge of the nature

[1] *New York City Demand and Wastewater Flow Projections*, August 1998.

and extent of various forms of pollution (e.g., toxic chemicals, sewage overflows, and floatables), reduce inputs of these pollutants, and increase the habitat and human use potential of the Harbor Estuary area. The floatables action plan of the HEP aims to reduce the amount of debris in the states' waters. It includes marine debris survey collection programs, improved street cleaning, combined sewer overflow and stormwater abatement, enforcement of solid waste transfer regulations, shoreline cleanup programs, and public education.

The HEP Habitat Workgroup developed watershed-based priorities for acquisition, protection, and restoration. USACE New York District began a feasibility study in 2001 to assess potential sites for habitat restoration in the Harbor Estuary. In May 2003 the Regional Plan Association identified needs and opportunities for environmental restoration in the Harbor Estuary. These sites involve the preservation and enhancement of tidal wetlands that will provide improved habitat for fish and macroinvertebrates as well as the birds, mammals, and reptiles that depend on these habitats. HEP Acquisition and Restoration Sites have been identified within Coney Island Creek, and Shell Bank Basin. These programs will result in improved water quality and aquatic habitat within these areas.

NEW YORK CITY PROJECTS

Wetlands

New York City Local Law 83 of 2005 established a temporary Wetlands Transfer Task Force (WTTF) to evaluate the technical, legal, economic, and environmental transferability of city-owned wetlands to the jurisdiction of DPR. A total of 3,537 acres of city-owned property containing both wetlands and adjacent upland habitat were evaluated including parcels located along Coney Island Creek. In September 2007, the WTTF report was released setting forth recommendations for each parcel. Properties were assigned a "no change," "special review" or "transfer" designation. The report recommended the transfer of 255.3 acres to DPR and 12 acres to DEP. All Coney Island wetlands properties were assigned a "no change" or "special review" designation and were not recommended for transfer. Final decisions regarding the WTTF recommendations are to be made by the mayor of the City of New York (WTTF 2007). As a response to the WTTF efforts, the city formed an interagency wetlands policy task force to study gaps in existing State and Federal wetlands laws and threats to the protection of wetlands in the City (PlaNYC 2008).

Water Quality

USEPA National CSO Strategy of 1989 requires states to eliminate dry weather overflows of sewers, meet federal and state water quality standards for wastewater discharges, and minimize impacts on water quality, plant and animal life, and human health. New York City committed $1.5 billion for construction of CSO abatement facilities over the period from 1998 to 2008, which should result in future improvement in the coliform, DO, and floatables levels in open waters and tributaries of the Harbor Estuary. The City also recently completed improvements to its wastewater treatment plants, which should lead to further decreases in coliform counts and floatables levels.

As required by USEPA's CSO Control Policy, DEP initiated its LTCP Project in 2004. The LTCP Project will integrate CSO Facility Planning and the Comprehensive City-Wide Floatables Abatement Plan, and incorporate ongoing Use and Standards Attainment Program (USA) Project work. The LTCP Project monitors and assures compliance with applicable Administrative Consent Orders between DEC and New York City for the CSO Abatement Program. Additionally, DEP

plans to increase identification and control of pollutants of concern, including mercury, PCBs, and solvents. The Drainage Basin Specific and City-Wide LTCP that will be developed is intended to further control CSO discharges.

As discussed in "Aquatic Resources," Coney Island Creek is listed on the New York State 1998 Section 303(d) list as an impaired waterbody and was scheduled for TMDL development. However, the Draft 2008 Section 303(d) list of impaired waterbodies includes the list of waters that are impaired but no longer requiring a TMDL. The waterbody was delisted because other required control measures, resulting from the implementation of Consent Order signed by NYSDEC and NYC in 2005, are expected to result in restoration of the waterbody. The 2005 Consent Order directed the City to develop and submit a WWFP for Coney Island Creek to address CSO discharges by June 2007 and submittal of a Drainage Basin Specific LTCP for these same watersheds by August 2012. As part of this plan, DEP is proposing to upgrade and rehabilitate the Avenue V Pumping Station to meet CSO abatement requirements and pumping station capacity and flow conveyance requirements established by the New York NYSDEC and to comply with the EPA Final CSO Policy. DEP would increase wet weather flow capacity at the pumping station from approximately 30 million gallons per day (mgd) to 80 mgd. The LTCP Project has developed a draft WWFP for Coney Island Creek (www.hydroqual.com/temp/condy.pdf) and has submitted the report to DEC for review.

State and Regional Projects

The Hudson-Raritan Estuary Ecosystem Restoration Project (HRE) is a cooperative project being led by USACE and the Port Authority of New York and New Jersey with involvement from USEPA, USFWS, NOAA, National Resource Conservation Service, New Jersey Department of Environmental Protection, New Jersey Department of Transportation, NYSDEC, NYSDOS, DEP, DPR, and the New Jersey Meadowlands Commission. The study will identify the actions needed to restore the Hudson-Raritan Estuary and develop a plan for their implementation. The study area for the program includes all of the waters including the tidally influenced portions of all rivers and streams that empty into and ecologically influence the Harbor Estuary. The program has drafted a plan that presents an ecosystem approach to restoration of the Harbor Estuary, guidance for selecting specific projects, measurable objectives called target ecosystem characteristics, and tracking program performance (USACE 2004). Thirteen sites in New York and New Jersey have been identified as the first sites for potential restoration projects and feasibility level analysis. It is anticipated that expedited restoration of these sites will provide substantial immediate value to the ecosystem. Calvert Vaux Park, formerly known as Dreier-Offerman Park, located along Coney Island Creek and the Lower Bay, has been identified as a representative site (HRE 2008).

THREATENED, ENDANGERED SPECIES OR SPECIAL CONCERN SPECIES

The threatened or endangered species and candidate species identified as having a potential to occur in the Lower New York Bay near the project site as transient individuals are expected to continue to occur as transient individuals in the future without the proposed actions. These species—shortnose sturgeon, Atlantic sturgeon, and the four species of sea turtles—are expected to benefit from the water quality improvements that would occur as a result of the projects discussed in the previous section.

ESSENTIAL FISH HABITAT

EFH designated for the portion of the Lower New York Harbor and Coney Island Creek near the project site is expected to be unchanged in the future without the proposed actions. The fish species identified as having EFH in the Lower New York Harbor and Coney Island Creek will benefit from the water quality improvements that would occur as a result of the projects discussed above in "Water Quality, Aquatic Resources, and Wetlands."

E. PROBABLE IMPACTS OF THE PROPOSED ACTIONS

The proposed actions would result in the mapping of City parkland (390,000 square feet (sf) or 9 acres) located between KeySpan Park and the landmarked Cyclone roller coaster to protect the historic open amusements and develop this portion of the project site into an open amusement and entertainment park, and 65,000 sf (1.5 acres) on Block 7071 (between West 22nd Street and West 23rd Street) to create a new neighborhood park). Surrounding these mapped parklands, the RWCDS would result in mixed-use development that would be supportive of retail, residential, recreational, and public space uses. In addition, the RWCDS is expected to include two parking garages, one at the New York Aquarium property, and the other at West 25th Street and Surf Avenue. Chapter 1, "Project Description," provides a detailed discussion of the development that would occur in the future with the proposed actions. Tables 2-4 and 2-5, in Chapter 2, "Land Use, Zoning, and Public Policy," summarize the total and net incremental development on the Coney East, Coney West, Coney North, and Mermaid Avenue subdistricts.

In the future with the proposed actions, 227,922 sf of vacant land in Coney East would be developed. The area occupied by amusement and supporting commercial uses would be permitted at greater densities than the future without the proposed actions and new commercial uses (e.g., hotels) would be introduced. Amusement space (346,317 sf) would increase by 251,411 square feet over the future without the proposed actions. Within the Coney West, Coney North, and Mermaid Avenue subdistricts, residential space (total of 3,035,410) would increase by 2,407,941 sf, and commercial space (596,977 sf) by 360,774 sf from the future without the proposed actions.

The RWCDS development scenario assumes that building heights would be maximized. Proposed text regulations would define massing regulations within the four zoning subdistricts described in Chapter 1, "Project Description" and illustrated in Figure 1-3. Within the three subdistricts, all structures would be no higher than the Parachute Jump (approximately 270 feet high). A detailed discussion of the maximum building heights that would be allowed for each subdistrict is discussed under "Terrestrial Resources" of this section.

The RWCDS would result in the following activities within the project site:

- Implementation of erosion and sediment control measures for demolition and construction activities that would occur within the project site.
- Removal of debris and existing vegetation from the project site, followed by other site preparation work (i.e., grading).
- Grading to bring the elevation of the proposed new streets, and certain existing streets (i.e., Surf Avenue between West 16th Street and West 21st Street, and segments of West 17th Street, West 19th Street, and West 20th Street) closer to or at the 100-year floodplain elevation as defined by FEMA regulations. This will enable ground floor commercial space to be closer to the 100-year flood elevation.

- Construction of new storm sewers meeting DEP design standards within existing streets not currently served by storm sewers and within new streets to be developed as part of the proposed actions.
- Construction of new sanitary sewers within new and existing streets to be constructed as part of the proposed actions.
- Implementation of stormwater management BMPs in compliance with NYSDEC's technical standard for the design of water quality controls (post-construction stormwater control practices) presented in the 2008 New York State Stormwater Management Design Manual, and NYCDEP on-site stormwater runoff management requirements.
- Construction of new residential units; retail, community and public facilities; streets, and utilities.
- Development of additional landscaped areas adjacent to commercial uses, community and public facilities, and residences, and along new and existing streets, including street regarding as noted above.

The potential for natural resource impacts to occur as a result of the proposed actions is discussed below.

GROUNDWATER

Significant adverse impacts to groundwater are not expected to occur as a result of construction or operation of the RWCDS. As discussed previously, because groundwater is not used as a potable water supply in this part of Brooklyn, the RWCDS development would not have the potential to affect drinking water supplies. Additionally, construction and operation of the RWCDS would have little potential to affect the formations of the Brooklyn Queens Aquifer system below the Upper Glacial aquifer that immediately underlies the project site. The hazardous materials assessment identified potential historical and present sources of contamination within all four subdistricts (see Chapter 11, "Hazardous Materials"). These Recognized Environmental Conditions included past or present existence of gasoline stations, dry cleaners, and/or petroleum storage tanks, and off-site releases from underground petroleum storage tanks with a potential of affecting the project site. To reduce the potential of adverse impacts associated with new construction resulting from the proposed actions, further environmental investigation would be required prior to development, by placing E-designations on privately owned land and Land Disposition Agreements (LDAs) or Memorandums of Understanding (MOUs) for city-owned land.

E-designations require the owner of the property to conduct a Phase I Environmental Site Assessment (ESA) in accordance with the American Society of Testing Materials (ASTM) E1527-05, and implement a soil and groundwater testing protocol, and remediation where appropriate, to the satisfaction of DEP before development-related building permits can be issued by the Department of Buildings (pursuant to Section 11-15 of the Zoning Resolution – Environmental Requirements). Additionally, construction-phase health and safety plans, which must also be approved by DEP, are required including procedures to address both any known concerns as well as contingencies should unexpected contamination be encountered. In the case of lots owned by the New York City Department of Housing Preservation and Development (HPD) with Recognized Environmental Conditions, LDAs created between HPD and the development sponsor would require a similar environmental review process to an E-designation. For other City-owned lots, NYCEDC and/or DPR would enter into a MOU with DEP that also

requires a similar environmental review process to the LDA or E-designation. Subsequent to the MOU, restrictive declarations would be placed on any sites to be disposed by NYCEDC to a private developer. With the implementation of these measures, the projected developments that would occur as a result of the proposed actions would not result in significant adverse impacts to groundwater resources.

Dewatering activities for construction of the RWCDS could require treatment of the groundwater before discharge to the municipal sanitary or storm sewer in accordance with DEP and NYSDEC requirements.

FLOODPLAINS AND WETLANDS

CONSTRUCTION

The entire project site is within the 100-year floodplain. Construction of new structures as a result of the proposed actions would not exacerbate flooding conditions within this portion of Coney Island. As discussed previously, New York City is affected by local (e.g., flooding of inland portions of the city from short-term, high-intensity rain events in areas with poor drainage), fluvial (e.g., rivers and streams overflowing their banks), and coastal flooding (e.g., long and short wave surges that affect the shores of the Atlantic Ocean, bays such as Upper New York Bay, and tidally influenced rivers such as the East River, streams and inlets [FEMA 2007]). The floodplain within and adjacent to the project site is affected by coastal flooding, which is influenced by astronomic tide and meteorological forces (e.g., northeasters and hurricanes [FEMA 2007]), and, therefore, would not be affected by projected development within this portion of the project site.

Any development that would occur within the project site would be consistent with the New York City Building Code (Title 27, Subchapter 4, Article 10) which requires that residential buildings have a finished floor elevation (FFE) at or above the 100-year floodplain, and the FEMA requirement that the FFE to be one foot above the 100-year floodplain. It is also noted that the proposed actions includes raising the grade of proposed new streets and certain existing streets to meet the 100 year elevation; including Surf Avenue between West 16th Street and West 21st Street, segments of West 17th Street, West 19th Street and West 20th Street north of Surf Avenue, West 21st Street between Surf Avenue and the public beach, Bowery between West 15th Street and Jones Walk, a segment of West 15th Street south of Surf Avenue, a segment of Stillwell Avenue between Surf Avenue and Wonder Wheel Way, and a segment of West 12th Street between Surf Avenue and Wonder Wheel Way—will be regraded to be closer to or at the 100 year flood elevation as defined by FEMA.

The proposed actions would be covered under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-08-001. To obtain coverage under this permit, a SWPPP would be prepared and a Notice of Intent (NOI) would be submitted to NYSDEC. The SWPPP would comply with all of the requirements of GP-0-08-001, NYSDEC's technical standard for erosion and sediment control presented in "New York Standards and Specifications for Erosion and Sediment Control," and NYSDEC's technical standard for the design of water quantity and water quality controls (post-construction stormwater control practices) presented in the 2008 New York State Stormwater Management Design Manual. Implementation of erosion and sediment control measures, and stormwater management measures identified in the SWPPP would minimize potential impacts tidal wetlands

within Coney Island Creek during land-disturbing activities resulting from construction of the proposed actions.

OPERATION

As discussed in Chapter 13, "Infrastructure," the majority of the project site is covered by impervious surfaces, such as buildings and paved parking lots. Stormwater runoff discharged to the separate DEP storm sewer would be treated to ensure compliance with NYSDEC standards, including the development of a SWPPP under the requirements of the SPDES General Permit For Construction Activity GP-0-08-001, and development of post-construction stormwater management practices. DEP would also review the SWPPP for consistency with DEP requirements related to sizing stormwater management controls based on the 10-year storm event, and DEP stormwater detention requirements. Because the 100-year floodplain within the project site is influenced by coastal flooding rather than local or fluvial flooding, the discharge of stormwater from the project site to Coney Island Creek would not result in significant adverse impacts to the 100-year floodplain or affect flooding in adjacent areas.

Operation of the proposed actions would not result in long-term significant adverse impacts to existing NYSDEC-designated littoral zone and coastal shoals and mudflats within Coney Island Creek, nor would it result in a significant increase in stormwater generated within the project site.

As discussed in Chapter 13, "Infrastructure," under existing conditions any stormwater runoff generated within areas not currently serviced by storm sewers, and that does not infiltrate, would runoff in accordance with the legal grade until reaching a storm sewer. Taking this into account, stormwater runoff generated within approximately 85 percent of the project site is presently reaching Coney Island Creek. The remaining area, including Coney West and approximately the southern third of Coney East subdistricts, do not currently drain to Coney Island Creek. Presently, much of the area within Coney East does not have storm sewers. Figure 13-2 illustrates the existing storm sewers, approximate catchment areas and the stormwater discharge points for each catchment.

A large proportion of the rezoning area is covered by impervious surfaces, such as buildings and paved parking, and would have high runoff coefficients. It is assumed that most of the buildings in the area pre-date any detention requirements and therefore do not provide any on-site stormwater detention. While more land area would drain to Coney Island Creek through the storm sewer system under the proposed actions, the quality of the stormwater would be improved and stormwater BMPs would be installed at each development site to control the rate of discharge to the storm sewer. The stormwater detention BMPs would likely comprise roof and underground storage with a regulating outlet device and would be sized for the 10-year storm event at an approved release rate. The sizing and release rate of each BMP would be reviewed by DEP and, therefore, would reduce the rate of stormwater discharge into the City storm sewer system, specifically to Coney Island Creek.

In addition to detention BMPs, retention BMPs such as green roofs, rain barrels or cisterns, more suitable given the well-drained subsurface conditions in the rezoning area and the projected development characteristics under the build condition, The Special Coney Island District would mandate that the buildings be located at the streetwall and that parking be wrapped within the future developments to activate the streets with ground-floor retail and residential uses. The 9.39-acre amusement park would contain a mixture of landscaped areas, open and enclosed amusements and small-scale buildings fronting Riegelmann Boardwalk. Ultimately, the

developer would be able to use several stormwater BMPs to achieve DEP's detention requirements, NYSDEC's water quality requirements and the City's sustainability initiatives, in accordance with the development standards included in the district zoning text.

Additional stormwater attenuation and treatment mechanisms would be included in the City's design of streets, parks, and development sites within the rezoning area; the design of these systems would be guided by the City's sustainability initiatives described in PlaNYC, the Mayor's Office's Sustainable Stormwater Management Plan, the Special Coney Island District zoning text, NYSDEC regulatory requirements and Stormwater Management Design Manual, and DEP's detention requirements and guidance documents. With these measures, as well as the retention and detention measures that would be implemented within the development sites, stormwater discharges to Coney Island Creek would be controlled such that significant long term decreases in the to the salinity of the creek would not be expected.

As discussed in "Existing Conditions," Coney Island Creek receives nearly 290 million gallons per year of combined sewage through the CSO outfall, and an additional 1,486 million gallons per year of urban stormwater. With the stormwater detention and retention BMPs that would be implemented within the project site, the proposed actions would not be expected to result in a significant increase in the quantity of stormwater discharged to the creek. Water quality sampling conducted by Hydroqual in August-September 2004 for the Coney Island Creek Waterbody/Watershed Facility Plan indicated that salinity fluctuates in the creek during precipitation events.

Smooth cordgrass (*Spartina alterniflora)* is a major component to salt marshes within the New York City metropolitan area, and within Coney Island Creek. This species is currently exposed to salinity fluctuations within the creek due to seasonal fluctuations in salinity and present levels of stormwater input. While the ideal salinity range for smooth cordgrass is between 8 and 33 parts per thousand (USDA 2000), this species will tolerate regular inundations of water with salinity ranges of 0 to 35 parts per thousand (USDA 2002). This species does not require saline water to survive, and is often propagated in low salinity conditions when cultivated for restoration projects at nurseries (USDA 2000). With the detention controls that would be required as part of the proposed actions, salinity fluctuations due to wet weather discharges may be reduced within the creek, and would not be expected to result in long-term reductions in salinity below the ideal salinity range for smooth cordgrass or result in these species being less competitive in the Coney Island Creek system than common reed.

The operation of the proposed actions would result in an increased sanitary sewage discharge of approximately 1.2 mgd to the Coney Island WPCP, a 0.9 mgd increase over the No Build scenario. The volume of sanitary sewage generated by the proposed actions in 2019 is about 0.011 percent of the SPDES permitted flow and when combined with the highest DEP-projected flows for the Coney Island WPCP sewershed for the 2019 analysis year of 90.0 mgd, would be well below the Coney Island WPCP SPDES permitted and design capacity of 110 mgd. Therefore, the proposed actions would not be expected to adversely affect compliance of the WPCP effluent with the SPDES permit limits, or adversely affect tidal wetlands within Shell Bank Creek.

TERRESTRIAL RESOURCES

CONSTRUCTION

The construction of elements of the proposed actions would impact terrestrial resources from activities such as grading, land clearing and excavation, removal of the existing urban structure exterior habitat, temporary access roads and staging areas for construction vehicles, piling of debris near or within vacant areas, and noise. As project elements are constructed, the plant communities within the present undeveloped lots would be removed, to be replaced by residential development and some open space.

The majority of plant communities occurring within the project site are not particularly diverse or unique. Most of the plant communities present within undeveloped portions of the project site are common to urban vacant land, and are primarily populated by introduced, invasive and urban-tolerant species, such as tree-of-heaven, mugwort, black locust, and common reed. The loss of such urban-adapted flora would not result in a significant adverse impact to plant communities in the NYC region.

It is noted that isolated areas of maritime dune and sand beach (two non-contiguous plots totaling less than 0.25 acres) along the northern edge of the Reigelmann Boardwalk would be removed as a result of the proposed actions. While small in area, the maritime dune and sand beach segments within the project site do contain some species unique to these habitat types (i.e., American beach grass, beach pea). Approximately 12 acres [1]of maritime dune habitat is present on Coney Island to the north and east of the project site, including at the mouth of Coney Island Creek, within Coney Island Creek Park and the Leon S. Kaiser Playground, and south of the Seagate community (approximately in the area between Beach 40th and Beach 46th streets). The two areas of maritime dune habitat within the project site represent about 0.02 percent of the maritime dune habitat present on Coney Island. Coordination with NYSDEC's NYNHP and Region 2 will be conducted to assess the present acreage and resource value of maritime dune habitats within the project site. While the loss of these dune habitats would be considered adverse, it would not represent a significant adverse impact to local (i.e., Coney Island) or citywide maritime dune habitat resources. Consideration will be given to incorporating these two dune habitat areas into the future land use plans as landscaped areas protected from pedestrian traffic. This would allow a natural community that was historically present in the area to be maintained, one that may require fewer resources to maintain than other landscaped areas. Such landscape design would be consistent with the vision of PlaNYC of creating sustainable, ecologically relevant landscapes within NYC.

The reduction in terrestrial habitat as a result of the proposed actions would displace some wildlife, the majority being urban-adapted or transient species, which currently occur within the project site at some point during the year. Potential wildlife habitat within the project site includes street trees, landscaped parks, a community garden, and open habitat found within the vacant portions of the project site. Mature trees present within the project site would be preserved, where possible, as part of the landscape design of the proposed actions, in order to agree with PlaNYC initiatives.

[1] Area of existing maritime dune habitat estimated by AKRF on the basis of interpretation of recent aerial photographs and site reconnaissance.

The loss of terrestrial habitat would have the potential to adversely affect some individual birds and other wildlife currently using the limited wildlife habitat within the project site should these individuals be unable to find suitable available habitats nearby. However, the wildlife species expected to occur within this area are common to urban areas, and the loss of some individuals would not result in a significant adverse impact on wildlife communities of the New York City region.

In summary, no significant adverse impacts to terrestrial resources are expected as a result of construction of the proposed actions. It is recommended that any landscape design investigates the suitability of incorporating sand beach and maritime dune habitats and plant communities along the Reigelmann Boardwalk area.

OPERATION

The operation of the proposed actions would replace all terrestrial resources present at the project site with residential, commercial and recreational development; new vegetated areas would be limited to landscape design surrounding the above developments. Human activity is already substantial within the project site, due to the presence of a swimming beach and amusement park. The amount of human activity through the year under the proposed actions would be expected to increase with the addition of residential units and commercial amenities, and during peak visitation in spring and summer months for recreation (i.e., redeveloped amusement park, Highland View Park). Street trees would also be planted along the public streets located within the project site. Landscaped vegetation (i.e., street trees, woody and herbaceous vegetation in parklands) within the proposed open space areas would provide similar to moderately improved habitat for urban-tolerant birds and other wildlife found within the project site. Landscaping that would be present as a result of the proposed actions would also have the potential to provide improved resting or stopover habitat for migratory songbirds during the spring and fall migration. However, this increase in bird habitat for resident and migratory species would have the potential to result in increased bird strikes on glass surfaces associated with the proposed development.

The maximum heights of the buildings to be developed on the project site would reach from 90 to 270 feet on portions of the site. These building heights would be slightly taller than the existing buildings immediately surrounding the project site. Building height, nighttime lighting, and the reflective nature of glass façades would all affect the potential for the proposed buildings to result in collisions by birds migrating at night (Schmidt-Koenig 1979, Ogden 1996, Avery et al. 1976 in Ogden 1996, Martin 1990 in Ogden 1996). In addition, both landscape design and building architecture at lower stories can affect the potential for the proposed buildings to cause daytime bird strikes. Approximately 75 percent of nocturnally migrating songbirds move at altitudes of between 500 and 2,000 feet (600 meters) above the ground (Deinlein undated, Kerlinger 1995). In general, structures that are about 500 feet or less in height (i.e., below the migratory altitude for most migratory songbirds) would be expected to pose a lower risk for bird collisions. Therefore, the proposed maximum building height within the project site (i.e., 270 feet) would pose a low risk for bird losses due to building strikes, and no significant adverse impacts to populations of songbirds migrating through New York City are expected. Consideration will be given during architectural design to the use of materials and landscape-building configurations that appear to reduce the potential for resident and migratory bird strikes, such as those outlined in NYC Audubon's '*Bird-Safe Building Guidelines*' (undated, www.nycaudubon.org).

AQUATIC RESOURCES

CONSTRUCTION

Implementation of erosion and sediment control measures (e.g., silt fences and straw bale dikes), and stormwater management measures as part of the SWPPP during construction and operation of the proposed actions would minimize potential impacts to water quality of the Coney Island Creek and within the Lower New York Bay in the vicinity of stormwater outfalls receiving stormwater runoff generated within the projects site during land-disturbing activities. These activities would include demolition of existing structures, debris removal, excavation activities for site grading, foundation work and placement of utilities, construction of sanitary and storm sewers, and activities associated with street construction.

As discussed in Chapter 11, "Hazardous Materials," the hazardous materials assessment identified potential historical and present sources of contamination within the project site. To reduce the potential of adverse impacts associated with new construction resulting from the proposed actions, further environmental investigation would be required prior to development, and remediation where appropriate, to the satisfaction of DEP before development-related building permits can be issued by the Department of Buildings (pursuant to Section 11-15 of the Zoning Resolution – Environmental Requirements). Additionally, construction-phase health and safety plans, which must also be approved by DEP, are required including procedures to address both any known concerns as well as contingencies should unexpected contamination be encountered. With the implementation of these measures, the projected developments that would occur as a result of the proposed actions would not result in significant adverse impacts to surface water quality or aquatic resources.

Groundwater recovered during dewatering of excavations would be treated in accordance with DEP and NYSDEC requirements before discharge to the municipal sanitary or storm sewer, and would not result in significant adverse impacts to the water quality or aquatic resources of Coney Island Creek or the Lower New York Bay in the vicinity of stormwater outfalls. Dewatering activities resulting in withdrawals exceeding 45 gallons per minute would require a Long Island Well permit.

OPERATION

As discussed in Chapter 13, "Infrastructure," the majority of the project site is covered by impervious surfaces, such as buildings and paved parking. As a result, the new development generated by the proposed actions would not result in a significant increase in stormwater generated within the project site.

All stormwater generated within the project site would be discharged to the separate DEP storm sewer. Stormwater runoff discharged to the separate DEP storm sewer would be treated to ensure compliance with NYSDEC standards, including the SPDES General Permit For Construction Activity GP-0-08-001 requirements for the development of a SWPPP, that would include post-construction stormwater management practices (i.e., stormwater BMPs) to regulate the quality and rate at which stormwater is discharged from the development site to the DEP storm sewer. DEP would also review the SWPPP for consistency with DEP requirements related to sizing stormwater management controls based on the 10-year storm event, and DEP stormwater detention requirements prior to authorizing connection to the City storm sewer. To meet these detention requirements, detention facilities would most likely be installed at each development site. Therefore, in the future with the proposed actions, the rate of stormwater

discharged to the City storm sewer system from the project site, and to Coney Island Creek and the Lower New York Bay through stormwater outfalls receiving runoff from the project site, would decrease. More detailed information on the stormwater infrastructure system is found in Chapter 13, "Infrastructure."

Therefore, the proposed actions would not result in significant adverse impacts to water quality or aquatic biota. While not a measurable benefit specifically associated with the proposed actions, it is noted that implementation of these and other system-wide measures would potentially improve the quality of stormwater and reduce the rate of discharge which could result in beneficial effects on Coney Island Creek and Lower New York Bay water quality. Such potential water quality improvements would also benefit the aquatic biota of these receiving waters.

The operation of the proposed actions would result in an increased sanitary sewage discharge of approximately 1.2 mgd to the Coney Island WPCP, a 0.9 mgd increase over the No Build scenario. The volume of sanitary sewage generated by the proposed actions in 2019 is about 0.011 percent of the SPDES permitted flow and when combined with the highest DEP-projected flows for the Coney Island WPCP sewershed for the 2019 analysis year of 90.0 mgd, would be well below the Coney Island WPCP SPDES permitted and design capacity of 110 mgd. Therefore, the proposed actions would not be expected to adversely affect compliance of the WPCP effluent with the SPDES permit limits, or result in significant adverse impacts to the water quality and aquatic biota of Shell Bank Creek.

ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

Presently, the majority of threatened, endangered and candidate species with potential to occur at and in the vicinity of the project site (i.e., roseate tern, piping plover, shortnose sturgeon, Atlantic sturgeon, and the four species of sea turtles) all likely occur as transient individuals. The aquatic species—shortnose sturgeon, Atlantic sturgeon and the four species of sea turtles—are expected to continue to occur as transient individuals in the future with the proposed actions. These species may benefit from water quality improvements that could occur due to the implementation of stormwater management measures discussed in the previous section.

Breeding populations of roseate terns and piping plovers would not occur at the project site, due to the lack of suitable habitat and the presence of humans and mammalian predators. Foraging individuals have the potential to occur near the project site (i.e., in the waters or adjacent shoreline of Rockaway Inlet), but would not be expected to be significantly impacted by the construction or operation of the proposed actions.

The minimal maritime dune and sand beach habitat present within the project site does not likely provide suitable habitat to support seabeach amaranth. Therefore, construction and operation of the proposed actions would not result in significant adverse impacts to seabeach amaranth.

A peregrine falcon was observed perching on the Parachute Jump within the project site during the December 2007 AKRF field observations. Although this species is not known to breed within the project site (Pane 2008) there have been breeding pairs on the nearby Verrazano and Marine Parkway/Gil Hodges Memorial Bridges. The proposed actions would not adversely affect the potential for peregrine falcons to nest on the Parachute Jump and the proposed residential structures may provide additional nesting habitat. Peregrine falcons would also be expected to continue foraging throughout the year at the project site, as the proposed actions would continue to support prey populations (i.e., rock pigeon). Construction of the proposed

actions would not result in adverse impacts to peregrine falcons foraging within the project site. Because peregrine falcons are accustomed to the intensely developed habitats of New York City, construction of the proposed actions would not be expected to result in significant adverse impacts to individuals foraging within the project site.

Additional coordination would be conducted with NYSDEC, NYNHP and NYCDEP prior to the anticipated start of construction if peregrine falcon nesting activity was observed within the project site. In the event that peregrine falcon nesting activity is documented as occurring on or near the project site prior to or during construction resulting from the proposed actions, measures to minimize potential adverse impacts to peregrine falcons would be developed in coordination with NYSDEC and NYCDEP. These measures would focus on minimizing potential impacts to nesting, foraging or roosting activity by adult falcons and offspring in the vicinity of proposed construction. Potential measures could include bird control devices on the tops of cranes or other tall construction equipment to prevent young falcons from landing on such equipment and becoming entangled or otherwise injured.

ESSENTIAL FISH HABITAT

EFH designated for the portion of the Lower New York Harbor and Coney Island Creek near the project site is expected to be unchanged in the future with the proposed actions. The fish species identified as having EFH in the Lower New York Harbor and Coney Island Creek are expected to benefit from the water quality improvements that may occur as a result of the implementation of stormwater management measures discussed under "Aquatic Resources."

F. CONCLUSIONS

GROUNDWATER

Significant adverse impacts to groundwater are not expected to occur as a result of construction or operation of the RWCDS. A hazardous materials assessment identified potential historical and present sources of contamination (see Chapter 11, "Hazardous Materials," for more information). Further environmental investigation would be required prior to development, by placing E-designations (for privately owned land) or LDA or MOU (for City-owned land). Additionally, construction-phase health and safety plans are required to address known concerns and contingencies should unexpected contamination be encountered. With the implementation of these measures, the projected developments that would occur as a result of the proposed actions would not result in significant adverse impacts to groundwater resources.

FLOODPLAINS AND WETLANDS

The entire project site is within the 100-year floodplain. Construction of new structures as a result of the proposed actions and the discharge of stormwater generated within the project site would not exacerbate flooding conditions within this portion of Coney Island because the floodplain within and adjacent to the project site is affected by coastal flooding rather than fluvial or local flooding.

The majority of the project site is covered by impervious surfaces, such as buildings and paved parking lots. Stormwater runoff discharged to the separate DEP storm sewer from the project site would be treated to ensure compliance with NYSDEC standards, including the SPDES General Permit For Construction Activity GP-0-08-001 requirements for the development of an SWPPP

that would include post-construction stormwater management practices. Implementation of erosion and sediment control measures, and stormwater management measures identified in the SWPPP, would minimize potential impacts to tidal wetlands within Coney Island Creek from the discharge of stormwater runoff generated within the project site during construction of the proposed actions.

Operation of the proposed actions would not result in long-term significant adverse impacts to existing NYSDEC-designated littoral zone and coastal shoals and mudflats within Coney Island Creek or adversely affect tidal wetlands within Shell Bank Creek.

TERRESTRIAL RESOURCES

Most of the plant communities present within undeveloped portions of the project site are common to urban vacant land and are primarily populated by introduced, invasive, and urban tolerant species. The construction of proposed actions would impact these terrestrial resources from activities such as grading, land clearing, excavation, and removal of the existing urban structure exterior habitat. However, the wildlife species expected to occur within this area are common to urban areas, and the loss of some individuals would not result in a significant adverse impact on wildlife resources of the New York City metropolitan region.

AQUATIC RESOURCES

Incrementally over time, potential benefits to water quality may result from the implementation of on-site stormwater best management practices by specific development projects. Over the long term, area-wide investment in new infrastructure associated with new streets or large-scale development may also require infrastructure upgrades that may have a beneficial effect on water quality associated with stormwater management when combined with additional stormwater quality and quantity controls. Ultimately, with or without the proposed Coney Island Rezoning, the City may invest in an area-wide Amended Drainage Plan (ADP) that comprehensively addresses both sanitary and stormwater demand on Coney Island (see Chapter 13, "Infrastructure," for more detailed information).

ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

The majority of the endangered, threatened, and candidate species with the potential to occur within the rezoning area are limited to transient individuals. The project site does not contain habitat required to support threatened and endangered species listed for the area that depend on beach habitat. A peregrine falcon individual was observed within the site in 2007 outside of the nesting season. Because peregrine falcons are accustomed to the intensely developed habitats of New York City, construction of the proposed actions would not be expected to result in significant adverse impacts to individuals foraging within the project site.

ESSENTIAL FISH HABITAT

The proposed actions would not result in significant adverse impacts on fish listed by NMFS as having essential fish habitat (EFH) for the Lower New York Harbor and Coney Island Creek. The proposed actions would not result in significant adverse impacts to water quality, nor would they adversely affect aquatic habitat within the vicinity of stormwater outfalls receiving stormwater runoff generated within the project site. Implementation of stormwater management measures that would occur as a result of this project may result in water quality improvements that would benefit aquatic biota of Lower New York Harbor and Coney Island Creek. ✷