Chapter 10: Natural Resources

A. INTRODUCTION

The *City Environmental Quality Review (CEQR) Technical Manual* defines natural resources 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." This chapter describes existing natural resources that occur at the project site and assesses potential adverse impacts on natural resources resulting from the Proposed Project. Specifically, this chapter assesses the difference in impacts on natural resources for Parcels L, M, and N between the Proposed Project and the program and site plan described in the 1992 Final Environmental Impact Statement (the 1992 FEIS), taking into consideration changes in natural resources that may have occurred on and in the vicinity of the project site since 1992.

The Reasonable Worst Case Development Scenario (RWCDS) for the natural resources analysis is the same as for the infrastructure analysis, which assumes a mix of uses that maximizes hotel uses. Therefore, the analysis is based on RWCDS 2 (see Chapter 1, "Project Description"), which assumes 2,100 residential units, 1,159 hotel rooms, 151,598 gross square feet (gsf) of community facility (public school), 244,036 gsf of retail, 52,209 gsf of office, and 276,011 gsf of auto showroom, 1,800 below-grade parking spaces, and 2.75 acres of privately owned, publicly accessible open space.

PRINCIPAL CONCLUSIONS

The Proposed Project would not involve construction activities in or immediately adjacent to the Hudson River and would not result in any significant adverse impacts on terrestrial plant communities or wildlife, or on floodplains, wetlands, water quality or aquatic biota in the Hudson River. The Proposed Project would involve the construction of five buildings, while No Build Scenario 1 would consist of three buildings and No Build Scenario 2 would consist of two buildings. The buildings in the Proposed Project would also be taller than the buildings for either of the No Build Scenarios, resulting in a greater potential for bird collisions. However, the buildings of the Proposed Project are comparable to buildings elsewhere in Manhattan and would not be expected to result in significant adverse impacts on migratory bird populations due to nighttime bird strikes. The building usage also differs between the Proposed Project and No Build Scenarios, with more residential space indicated for the Proposed Project. As a result, the Proposed Project would produce more sanitary sewage and a higher water demand than either No Build Scenario. However, these increases would not be expected to significantly affect natural resources. Potential benefits to natural resources that would result from the Proposed Project include modestly improved habitat for birds and other wildlife within the waterfront park and other open space areas. Therefore, the Proposed Project would not result in significant adverse environmental impacts on natural resources.

GROUNDWATER

Construction and operation of the Proposed Project would not result in any significant adverse impacts on groundwater. Groundwater is not used as a source of drinking water in Manhattan.

WETLANDS

No construction would occur in or immediately adjacent to the Hudson River as a result of the Proposed Project. Implementation of the stormwater pollution prevention plan (SWPPP), prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) "General Permit for Stormwater Discharges from Construction Activity," Permit No. GP-0-10-001, would minimize the potential for discharge of stormwater generated within the project site to result in any significant adverse environmental impacts on NYSDEC littoral zone tidal wetlands designated within the Hudson River.

FLOODPLAINS

Unlike fluvial flooding, which is affected by activities within the floodplain of a river, coastal flooding is influenced by astronomic tide and meteorological forces, and is not affected by activities within the floodplain. Therefore, the Proposed Project would not adversely affect flooding of areas adjacent to the project site.

A portion of the western area of the project site is located within the 100-year floodplain, which is affected by coastal flooding. However, all five of the proposed buildings within the project site would be constructed on a platform at about the elevation of the West End Avenue grade, which is well above the existing 100-year floodplain, as well as the New York City Panel on Climate Change (NPCC) projected flood elevation associated with the current 100-year storm due to sea level rise in the 2020s. Any development that would be consistent with Appendix G: "Flood Resistant Construction," of the *New York City Building Code* which specifies that the elevation of the lowest floor be at least one foot above the 100-year floodplain. The below-grade area below the platform for all-on-site structures would be waterproofed and designed to withstand the hydrostatic pressure exerted by groundwater during a 100-year flood event, consistent with the *New York City Building Code*. Therefore, the design for these structures would minimize the potential for public and private losses due to flood damage under current and projected flood conditions, and no significant adverse impacts are expected.

TERRESTRIAL RESOURCES

The Proposed Project would not result in significant adverse impacts on terrestrial resources at the project site. The majority of the project site is either covered with impervious surface or undergoing disturbance due to construction activities. As a result, little vegetation is present on the project site and is limited to street plantings (ornamental species such as ginko), invasive tree species (e.g., tree-of-heaven, royal pawlonia), and common non-native herbaceous vegetation growing on excavated material, and wildlife are limited to common species tolerant of these urban habitats (native species such as Eastern gray squirrel, American kestrel, and non-native wildlife species such as European starling). The Proposed Project would adversely affect these limited plant and wildlife resources due to removal of existing vegetation and displacement of wildlife using the project site during excavation, grading, land clearing, and platform construction. The loss of these plants and adverse impacts on some wildlife individuals would

not result in a significant adverse impact on terrestrial resources of the New York City metropolitan region.

The Proposed Project would create 2.75 acres of new publicly accessible open space that was not part of the development program evaluated in the 1992 FEIS, and would provide a street-level connection to open space areas of Riverside Park South along the Hudson River to the west of the project site. Landscaping of these open space areas with a variety of native and ornamental trees, shrubs, grasses, and herbaceous perennials would benefit wildlife resources by providing improved habitat for urban wildlife, including migratory songbirds, small mammals, and butterflies.

AQUATIC RESOURCES

The Proposed Project would not result in significant adverse impacts on water quality and aquatic biota of the Hudson River. No construction activities would occur in or immediately adjacent to the Hudson River during the construction of the Proposed Project. Implementation of the SWPPP prepared in accordance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-10-001 during construction would minimize the potential for adverse impacts on aquatic resources of the Hudson River during construction of the Proposed Project.

Although additional discharge of sanitary sewage would occur with the additional residential and commercial development when compared with the No Build Scenarios, the incremental increase (0.81 million gallons per day [mgd]) is small and would not be expected to cause the North River Water Pollution Control Plant (WPCP) to be above its permitted daily flow limit of 170 mgd or adversely affect compliance of the North River WPCP effluent with the SPDES permit limits. Consistent with the project as evaluated in the 1992 FEIS, new sanitary sewers would be extended to the project site. The discharge of the incremental increase in sanitary sewage from the Proposed Project to existing trunk and interceptor sewers would not change the conclusion of the 1992 FEIS that no significant adverse impacts on the sanitary sewer system would result from the development of the Riverside South project.

Under the existing condition, stormwater generated within the project site is discharged to the combined sewer system. As part of the 1992 FEIS, an Amended Drainage Plan was reviewed and approved by New York City Department of Environmental Protection (DEP). The Amended Drainage Plan established a separate stormwater system serving Parcels L, M, and N, except for 100 feet of street frontage along West End Avenue and West 59th Street. Under the existing condition, stormwater runoff from the project site is discharged to the combined sewer system. With the Proposed Project, stormwater runoff from the project site would be discharged to the new 61st Street storm sewer being constructed as part of the Amended Drainage Plan. In accordance with the Amended Drainage Plan, the new 61st Street storm sewer will discharge to the existing DEP outfall on 66th Street, downstream of the regulator.

Volumes to the combined sewer system are expected to increase due to the projected sanitary volumes, which during certain storm events, may exacerbate combined sewer overflow (CSO) volumes into the Hudson River. However, with new separate storm sewers, additional water conservation and stormwtaer management measures, and the considerable assimilative capacity of the Hudson River to quickly disperse pollutants, no significant adverse impacts on the aquatic resources of the Hudson River are expected to occur from the Proposed Project.

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

The Proposed Project would not involve any construction activities in or immediately adjacent to the Hudson River, and would not result in significant adverse impacts on water quality. Therefore, the Proposed Project would not result in significant adverse impacts on Significant Coastal Fish and Wildlife Habitats within the lower Hudson River.

RARE, SPECIAL CONCERN, THREATENED AND ENDANGERED SPECIES

Rare, special concern, threatened, endangered, and candidate species with the potential to occur within the vicinity of the project site are limited to aquatic species that are likely transient. No construction activities would be conducted in or immediately adjacent to the Hudson River as part of the Proposed Project, and increases in sanitary sewage and stormwater discharge would not result in a significant adverse impact on water quality. Therefore, the Proposed Project would not result in significant adverse impacts on state- and federally listed sturgeon species (as identified by regulatory agencies as occurring in the vicinity of the project site).

B. SUMMARY OF 1992 FEIS FINDINGS

The following is a brief summary of the Natural Resources findings for the entire Riverside South project from the 1992 FEIS.

Existing terrestrial vegetation and wildlife were characterized as well adapted to disturbed areas. Proposed open space and parklands would potentially represent a net increase in habitat value for wildlife.

In its discussion of aquatic resources, the 1992 FEIS acknowledged that the project would include a number of modifications to the Hudson River shoreline within the 100-year flood zone. However, it was determined that any in-water work at the shoreline and piers would not have significant impacts on the Hudson River; any added piles would be widely spaced; tidal circulation and sedimentation would not be impeded; and habitats for aquatic biota would not be significantly impacted.

Landward construction at the shoreline was determined to include the development of a shoreline park and several buildings with limited areas of landscaped open space. The proposed park construction would involve the repair of the bulkheads and reshaping of riprap, neither of which would add nor subtract from the project site's aquatic habitat. The shoreline substrate was noted as sandy and rocky, without any intertidal wetland communities.

As of the date of this Supplemental EIS (SEIS), the shoreline parkland has been developed as Riverside Park South, managed by the New York City Department of Parks and Recreation (DPR).

C. METHODOLOGY

This section presents the methodology used in this chapter to describe natural resources within the project site under existing and future conditions, and to assess potential impacts on these resources as a result of the Proposed Project.

The study area for the natural resources investigation was limited to the project site and a surrounding 400-foot area. The study area for water quality and aquatic resources included aquatic resources within the Hudson River and the Hudson River waterfront portion of the

project site. Within the Hudson River, the analysis focused on areas of the river with the potential to receive CSO discharges originating from the project site, including the North River WPCP located north of the project site**.**

Regarding assessment of threatened and endangered species, the analysis included only aquatic species, as no terrestrial threatened and endangered species are known to be present on the project site (See Appendix C-1 for agency correspondence). The Hudson River in the vicinity of the project site was assessed for potential impacts on threatened and endangered species, and significant coastal fish and wildlife habitats as a result of the Proposed Project.

The analysis of potential impacts on natural resources and floodplains from the proposed actions considered the potential effects for full development of the project site in accordance with the RWCDS.

The methodology outlined in the *CEQR Technical Manual* was used to characterize existing conditions and assess potential impacts on natural resources located throughout the natural resources study area.

ASSESSMENT OF EXISTING AND FUTURE NO ACTION CONDITIONS

The existing conditions of floodplains, surface water, groundwater, wetlands, terrestrial resources, and significant, sensitive, or designated resources within the project area was assessed on the basis of the following database, reports, maps, and other sources:

- Field observations during an October 13, 2008 site visit to the project site to describe existing aquatic (excluding sampling for biota) and terrestrial resources. Habitat classifications were made based on direct observation and examination of current and past uses of the project site.
- Ecological Communities of New York State (Edinger et al. [2002]).
- United States Geological Survey (USGS)—topographic quadrangle map for the Central Park and Weehawken quadrangles.
- NYSDEC: Breeding Bird Atlas (NYSDEC 2009b), Tidal Wetlands Maps, Herp Atlas Project (NYSDEC 2009a).
- United States Fish & Wildlife Service (USFWS) NWI map for the USGS Central Park and Weehawken topographic quadrangles.
- Existing information identified in literature and obtained from governmental and nongovernmental agencies, including the DEP Harbor Water Quality Survey annual reports (DEP 2001, 2002, 2003, 2004, 2005, 2006, 2007a, 2007b); DEP effluent data for the North River WPCP; New York/New Jersey Harbor Estuary Program; and U.S. Army Corps of Engineers (USACE) studies conducted as part of the New York and New Jersey Harbor Navigation Project (USACE 1999).
- Responses (Colligan 2009 and Salerno 2009) to requests for information on rare, threatened, or endangered species within the vicinity of the project sites submitted to USFWS (New York office), National Marine Fisheries Service (NMFS), and the New York National Heritage Program (NYNHP). NYNHP, a joint venture of NYSDEC and The Nature Conservancy (TNC) since 1985, maintains an ongoing, systematic, scientific inventory on rare plants and animals native to New York State. NYSDEC maintains the NYNHP files. The NYNHP database is updated continuously to incorporate new records and changes in the status of rare plants or animals. In addition to the State program, USFWS maintains an

online database for federally-listed threatened or endangered freshwater and terrestrial plants and animals, and NMFS for federally-listed threatened or endangered marine organisms.

In the Future Without the Proposed Project, the project site, which comprises the study area for the groundwater, floodplains, and terrestrial resources, would be developed in accordance with one of two scenarios. Under No Build Scenario 1, Parcels L, M, and N would be developed according to the original 1992 FEIS program. Parcels L and M would be developed with residential buildings with office space and public parking. Parcel N would be developed with a mix of retail, office, entertainment studio production, cinema, and parking uses. Under No Build Scenario 2, the original 1992 FEIS program would be completed for Parcels L and M, but Parcel N would remain in its current parking use.

The assessment of water quality and aquatic resources for the Future Without the Proposed Project considered ongoing and proposed projects in the vicinity of the project site, including:

- Potential effects on the resources of the Lower Hudson River from the discharge of stormwater and sanitary sewage from the portions of the Riverside South Project that would be completed by 2018 in accordance with the Amended Drainage Plan;
- Water quality and sediment quality improvements expected to occur as a result of regional and local programs by 2018;
- 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 the Hudson River resulting from New York City projects. This includes the development of the city-wide Long-Term Control Plan (LTCP) that will be developed in compliance with EPA's 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 IMPACTS FROM PROPOSED PROJECT

With the Proposed Project, stormwater discharged from the project site to the Hudson River could affect the Hudson River's water quality and aquatic habitats. Additional sanitary discharges to the combined sewer system generated by the Proposed Project have the potential to affect infrastructure (e.g., combined sewer system, separate sanitary sewers, and North River WPCP) and subsequently affect aquatic resources of the Hudson River from CSOs and the North River WPCP, and are considered in the context of the city-wide LTCP and other requirements of the 2005 Consent Order to control pollutant discharges from CSOs.

Potential impacts on the floodplains, wetlands, aquatic and terrestrial resources from the Proposed Project were assessed by considering the following:

- Existing water quality and natural resources within the study area;
- Temporary impacts on water quality and aquatic biota from the discharge of stormwater during construction of the Proposed Project;
- Temporary impacts on water quality and aquatic biota from the possible discharge of groundwater recovered during dewatering;
- Temporary impacts on terrestrial resources associated with land clearing, grading, and other activities associated with construction of the Proposed Project; and

- Potential long-term beneficial impacts on plants and wildlife from the proposed landscaping within open space areas developed along the project site.

REGULATORY CONTEXT

Stormwater discharges and activities within the New York State coastal zone and the floodplain, require compliance with State and federal laws and regulations that pertain to activities in coastal areas, surface waters, floodplains, and the protection of species of special concern. The laws and regulations that may apply to the Proposed Project are described below.

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

The objective of the Clean Water Act, also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of U.S. waters. It regulates point sources of water pollution, such as discharges of municipal sewage and industrial wastewater, and the discharge of dredged or fill material into navigable waters and other waters of the United States. It also regulates non-point source pollution, such as runoff from streets, agricultural fields, construction sites, and mining operations that enters waterbodies from other than the end of a pipe.

State Pollutant Discharge Elimination System (New York Environmental Conservation Law 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, Environmental Conservation Law (ECL), Water Pollution Control, authorized the creation of the State Pollutant Discharge Elimination System (SPDES) to regulate discharges to the state's waters. Activities requiring a SPDES permit include wastewater discharges from pipe (point source) into the state's surface water or groundwater, including the intake and discharge of water for cooling purposes; constructing or operating a disposal system (sewage treatment plant); discharge of stormwater; and construction activities that disturb one or more acres.

Coastal Zone Management Act of 1972 (16 USC §§ 1451 to 1465) and Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Sections 910-921, Executive Law, Implementing Regulations 6 NYCRR Part 600 et seq.)

The Coastal Zone Management Act of 1972 (CZMA) established a voluntary participation program to encourage coastal states to develop programs to manage development within the state's designated coastal areas to reduce conflicts between coastal 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.

In accordance with the CZMA, New York State adopted its own Coastal Management Program (CMP), designed to balance economic development and preservation by promoting waterfront revitalization and water-dependent uses while protecting fish and wildlife, open space and scenic areas, public access to the shoreline, and farmland; and minimizing adverse changes to ecological systems, and erosion and flood hazards. Under the Waterfront Revitalization of Coastal Areas and Inland Waterways Act, the New York State Department of State (NYSDOS) is responsible for administering the CMP in New York. The New York State CMP provides for local implementation when a municipality adopts a local waterfront revitalization program, as is the case in New York City. The New York City Waterfront Revitalization Program (WRP) is the city's principal coastal zone management tool.

Where local WRPs have been adopted and approved by NYSDOS, activities within the coastal zone of these municipalities must comply with the local WRP in lieu of the CMP. New York City has an approved WRP that is administered by the New York City Department of City Planning (DCP). As discussed in detail in Chapter 12, "Waterfront Revitalization Program," Policy 4 of the New York City WRP also specifies that the ecological quality and component habitats and resources within the Special Natural Waterfront Areas, Recognized Ecological Complexes, and Significant Coastal Fish and Wildlife Habitats are to be protected and restored.

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

The Endangered Species Act of 1973 recognized that endangered species of wildlife and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people. The Endangered Species 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 Endangered Species Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival.

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 that are listed in 6 NYCRR §182.6.

D. EXISTING CONDITIONS

This section describes existing conditions of terrestrial and aquatic resources.

GROUNDWATER

A clay/silt layer, which ranges in thickness from a few feet to 40 feet, separates nearly all of the fill material (the top layer of site soils) from a sandy layer under the clay (AKRF, 1992). Beneath the sandy layer, most of which ranges from a few feet to 20 feet in depth, is bedrock. The spaces between sand grains are filled with water, which is under pressure and which pushes upward toward the clay layer. There is very little interconnection between the water table in the fill material and the water aquifer in the sand layer (i.e., interconnection only occurs in isolated areas along the eastern edge of the project site). Rain and snowmelt from the project site either percolate into the miscellaneous fill that comprises the soils on the project site or runoff to the combined sewer system. Ponding occurs where debris or the flatness of the terrain prevents drainage toward the river (AKRF, 1992); such ponding was noted during the AKRF natural resources observations on October 13, 2008.

Groundwater on the project site (i.e., the water table aquifer) is generally located at Elevation -2 to +4 feet Mahnattan Borough Datum (MBD) in the fill material and flows west toward the Hudson River. For the portion of the project site within 200 feet of the Hudson River, the water table aquifer is tidally influenced by the Hudson River (AKRF, 1992).

Phase I Environmental Site Assessments (ESAs) were conducted for Parcels L and M in June 2005 by Langan Engineering and Environmental Services, Inc. (Langan). A Phase II Subsurface Investigation of Parcels L, M and N was conducted in June 2009 by AKRF.

As discussed in detail in Chapter 11, "Hazardous Materials," groundwater samples contained concentrations of metals and occasionally semi-volatile organic compounds (SVOCs) above NYSDEC Class GA Ambient Water Quality Standards (drinking water standards), likely due to suspended sediment in the samples. Detected volatile organic compounds (VOC) concentrations were generally below Class GA standards, except two VOCs (acetone and p-isopropyltoluene) detected above Class GA standards in one groundwater sample each during the 2009 Phase II study. The detected concentrations of VOCs in groundwater appeared to be due to off-site sources and/or urban fill beneath the site, and did not appear to indicate on-site petroleum contamination.

FLOODPLAINS AND WETLANDS

Figure 10-1 shows the 100-year and 500-year floodplain boundaries (i.e., the area with a 1 percent chance and 0.02 percent chance, respectively, of flooding each year) within the project site. As illustrated in the figure, the western third of the project site is within the 100-year floodplain. The 100-year flood elevation is 10 feet above National Geodetic Vertical Datum (NGVD), which approximates mean sea level (MSL). New York City is affected by local street flooding (flooding of upland streets due to short-term, high-intensity rain events in areas with poor drainage), fluvial flooding (rivers and streams overflowing their banks), and coastal flooding (long and short tidal rises and wave surges that affect the shores of the Atlantic Ocean, bays such as Upper New York Bay, and tidally influenced rivers, streams and inlets [Federal Emergency Management Agency {FEMA} 2007]). The Hudson River waterfront is affected by local street flooding and coastal flooding due to rising tides (without wave action). Between West 62nd Street and West 60th Street exists a crib-wall, and south of 60th Street, the shoreline is riprap.

The Hudson River shoreline within the project site is engineered with bulkhead and/or riprap and provides limited potential for tidal marsh plants or submerged aquatic vegetation. The USFWS National Wetlands Inventory (see **Figure 10-2**) classifies the waters of the Hudson River within the vicinity of the project site as estuarine subtidal wetlands[1] with unconsolidated bottom (E1UBL). In a 1987 site examination, the substrate of the intertidal zone next to the project site was largely observed to be sandy and rocky (AKRF 1992). No vascular plants were observed growing along the shoreline, and no intertidal wetlands were present.

NYSDEC designates the Hudson River as littoral zone, defined as shallow waters 6 feet or less in depth that are not included in other NYSDEC tidal wetland categories (see **Figure 10-3**). However, NYSDEC regulations state that actual water depths determine whether or not an area is a littoral zone. National Oceanic and Atmospheric Administration (NOAA) nautical chart number 1235, *Hudson and East River Governors Island to 67th Street* (NOAA 2010), indicates depths of between 1 and 17 feet at Mean Lower Low Water (MLLW) in the vicinity of the shoreline from West 59th Street to West 66th Street near the combined sewer outfall that would receive stormwater discharge from the project site. These reported water depths suggest that water depths less than 6 feet at MLLW may occur along the shoreline near the project site.

[1] Subtidal estuarine wetlands are continuously submerged areas with low energy and variable salinity, influenced and often enclosed by land. Unconsolidated bottoms have at least 25 percent cover of particles smaller than 6 or 7 centimeter (cm), and less than 30 percent vegetative cover.

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RIVERSIDE CENTER

Flood Plains
Figure 10-1

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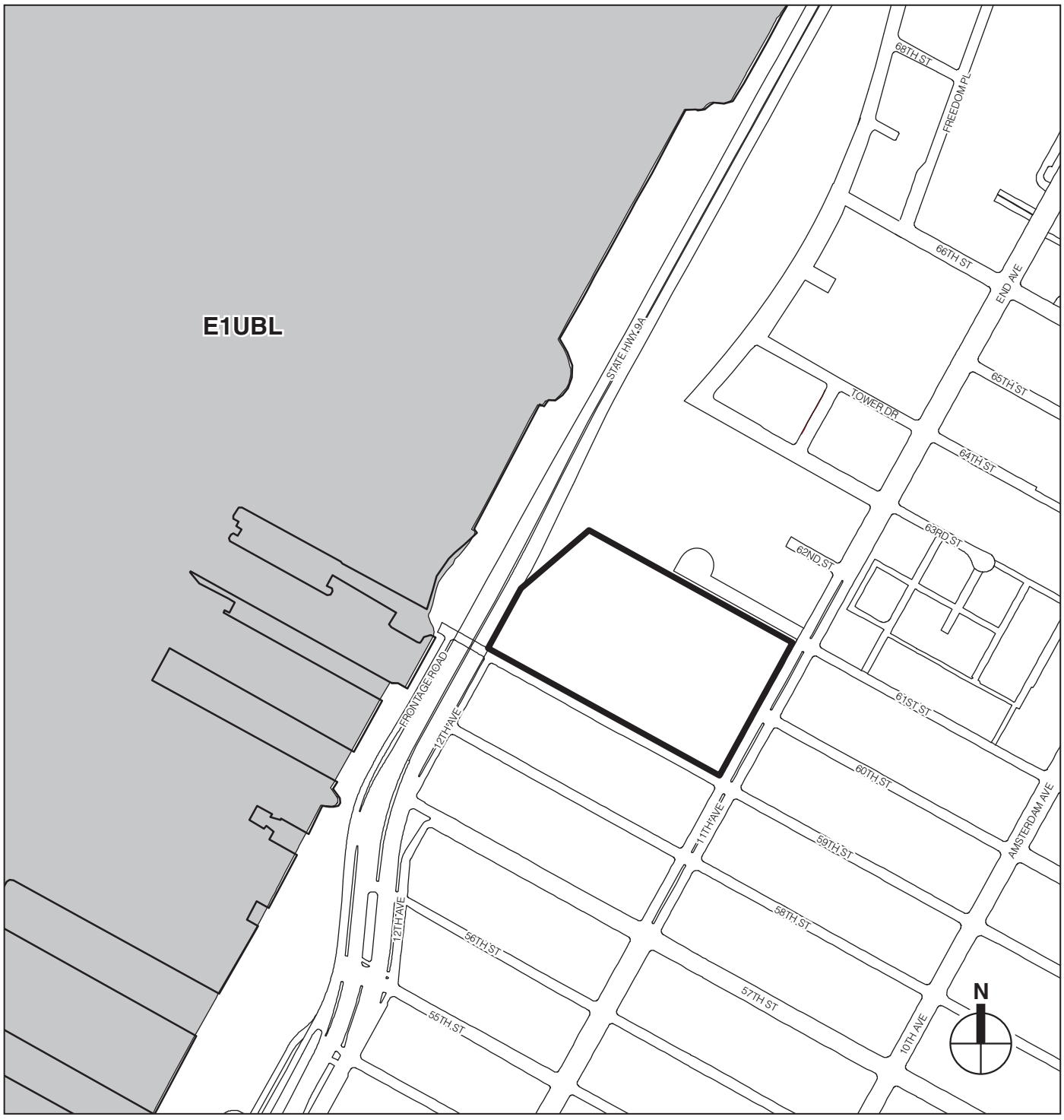

RIVERSIDE CENTER

NWI Wetlands
Figure 10-2

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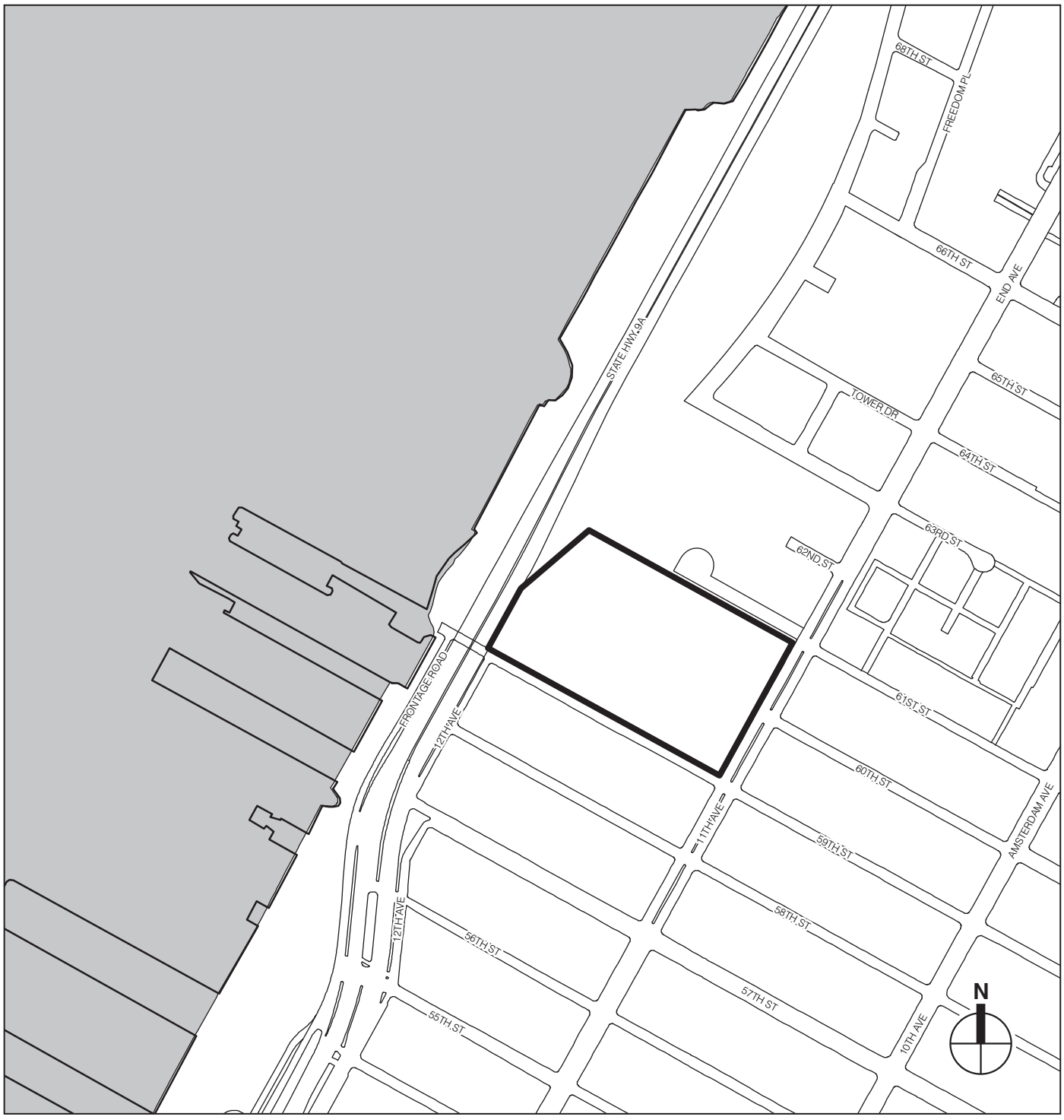


RIVERSIDE CENTER

NYSDEC Wetlands
Figure 10-3

TERRESTRIAL RESOURCES

FLORA

As noted in **Figure 10-4**, the majority of the project site is either covered with impervious surface (parking lot, buildings) or undergoing disturbance due to excavation activities (i.e., active excavation or storage of excavated material). As a result, little vegetation is present on the project site, and is limited to street plantings, invasive tree species, and common non-native herbaceous vegetation growing on a soil mound, likely created by excavation activity on and adjacent to the site. Several individual trees (invasive species royal pawlonia and tree-of-heaven) are present within the southwestern corner of the project site. A line of street trees (ginko) is present along the southern boundary of the project site (West 59th Street). A large dirt mound recently colonized by common weedy species (pokeweed, mugwort, ragweed, bitter nightshade, and others) is present in the central portion of the project site. In general, this site has been routinely disturbed by construction activities, and meets the definition of "urban vacant lot" noted in Edinger et al. (2002).

Approximately 13 acres of parkland have been recently created along the Hudson River shoreline; between West 59th and West 72nd Streets west of the West Side Highway; and between West 68th and West 71st Streets east of the West Side Highway. The segment located west of the project site (Riverside Park South) is a multi-use park with mowed lawn, paved pathways, and planted trees, shrubs, and herbaceous vegetation. Plantings include numerous native and ornamental species, such as red, white, and chestnut oaks, shagbark hickory, river birch, eastern red cedar, pitch pine, Japanese black pine, eastern hemlock, red twig dogwood, bayberry, inkberry, various switchgrass species and cultivars, Joe Pye weed, and salt-meadow cordgrass.

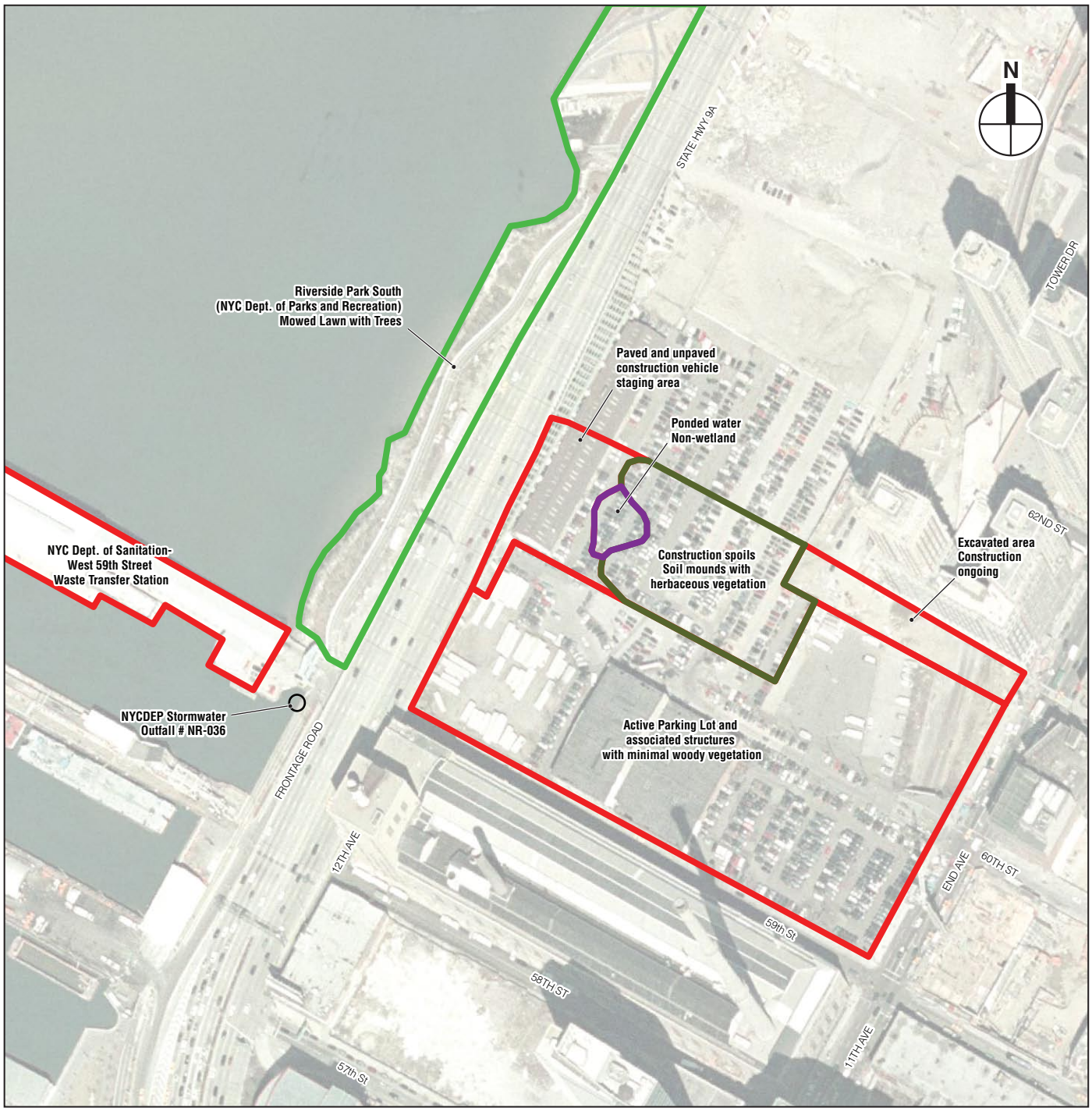
FAUNA

Wildlife observed on the project site includes common, urban-adapted species such as rock pigeon, house finch, house sparrow, and eastern gray squirrel. The large soil mound in the northern-central area of the project recently colonized with herbaceous vegetation provides cover for a variety of winter resident bird species (song, swamp, and white-throated sparrows, slate-colored junco, palm warbler, and common yellowthroat). During the October 2008 site visit, an American kestrel was observed perching on a nearby crane and foraging in the project site area. Kestrels are known to nest on buildings in western Manhattan, but are also common fall migrants through the area.

During spring and fall, it would be expected that seasonal migrants (including birds, bats, and insects such as butterflies and moths) would pass through the vicinity of the project site during northbound or southbound transit. New York City is situated within the Atlantic Flyway, a major passageway for migratory species; this is due to the city's coastal location and other geographic features. New York City is an important migration corridor and stopover site for neotropical migrant songbirds (i.e., migratory bird species that breed in North America and winter in the Caribbean, Mexico, and Central/South America) in the New York Bight Watershed. Surveys of migrating birds in open spaces in the New York City metropolitan area have revealed a high abundance and diversity of such birds (Elbin, 2008). However, the present lack of suitable natural habitat makes it unlikely that any wildlife would remain in the vicinity of the development site for any extended period of time.

In addition, several state-listed species, such as the peregrine falcon, are known to breed and forage in highly urban areas.

2.25.09



RIVERSIDE CENTER

Terrestrial Resources
Figure 10-4

The piers, and bulkheaded and riprapped Hudson River shoreline in the vicinity of the project site would be expected to provide resting and perching habitats for waterfowl and shorebirds. The areas of shoreline with riprap would also be expected to provide feeding habitat for shorebirds and waterfowl. Waterfowl known to occur along the Hudson River during the spring and fall migratory periods include American black duck, American wigeon, bufflehead, canvasback, Goldeneye, greater scaup, green-winged teal, hooded merganser, lesser scaup, mallard, northern shoveler, red-breasted merganser, and ruddy duck (National Oceanic and Atmospheric Administration [NOAA], 2001). Waterfowl that might be expected to occur on the Hudson River shoreline within the project area throughout the year include American black duck, Canada goose and mallard. Wading birds such as herons and egrets, and shorebirds such as sandpipers and gulls, would also be expected to occur along portions of the Hudson River shoreline with riprap.

AQUATIC RESOURCES

The project site, and the existing DEP outfall that would discharge stormwater generated within the project site, are located along the Manhattan shoreline of the Hudson River within the Lower Hudson River Estuary. The Lower Hudson River Estuary is part of the New York/New Jersey Harbor Estuary, which also includes upper and lower New York Harbor, Arthur Kill, Kill Van Kull, the East River, Raritan Bay, and Jamaica Bay. The Hudson River is the largest single freshwater input to this coastal plain estuary. The Hudson River Estuary extends approximately 150 miles upriver from the Battery to the Federal Dam at Troy, New York. The river gradient within the estuary is very low, rising only 5 feet, and is tidally influenced throughout this extent (Moran and Limburg 1986).

The mean tidal range in the Hudson River is 4.2 feet at the project site. The spring tide range at the site is 5.0 feet. Mean high water is at 2.10 feet above MSL, and mean low water is at -2.10 feet below MSL. Tidal currents in the area are strong, with maximum velocities of 2.8 knots normally occurring during spring low water ebb tides. Conditions differ greatly where piers are located along the shoreline. Within interpier basins, tidal velocities are slowed to 0.2 to 0.4 knots.

Salt water and tides dominate the flows and physical characteristics of the Lower Hudson River Estuary. The estuary receives salt water from Upper New York Harbor during the flood (rising) phase of a tidal cycle, discharging less saline water to the Upper Harbor during the ebb (falling) phase (Moran and Limburg 1986). The estuary is partially stratified: More saline waters are generally found toward the bottom, and fresher waters toward the surface. However, under low freshwater flow conditions, the fresh and saline waters are generally well-mixed (Busby and Darmer 1970).

WATER QUALITY

The water quality of the Lower Hudson River Estuary is strongly affected by human activity upstream and the densely populated and industrialized land uses that surround it. Historically, water quality problems included low dissolved oxygen (DO) content, high nutrient concentrations, algal blooms, excessive numbers of coliform bacteria, and the presence of floatables. However, the construction and upgrading of WPCPs, and implementation of water pollution control programs throughout New York have greatly reduced nutrient inputs and improved water quality (Brosnan and O'Shea 1995).

Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 703 includes surface water standards for each use class of New York surface waters. The lower Hudson River is Use Classification I saline surface waters. Best usages for Use Class I waters are secondary contact

recreation and fishing. Water quality should be suitable for fish propagation and survival. Water quality standards for fecal and total coliform, DO, and pH for Use Class I waters are as follows (there are no New York State standards for chlorophyll a or water clarity):

- Fecal coliform—Monthly geometric mean less than or equal to 2,000 colonies/100 milliliters (mL) from five or more samples;
- DO—Never less than 4 milligrams per liter (mg/L); and
- pH—The normal range shall not be extended by more than 0.1 of a pH unit.

The City of New York has monitored New York Harbor water quality with an annual survey (Harbor Survey) for over 90 years. DEP evaluates surface water quality of four designated regions: Inner Harbor Area, Upper East River-Western Long Island Sound, Lower New York Bay-Raritan Bay, and Jamaica Bay (DEP 2007a). The project site is located along the eastern shore of the lower Hudson River, which is within the Inner Harbor Area. The Inner Harbor Region includes the lower Hudson River to the Harlem River, the East River to the Battery, the Kill Van Kull and Arthur Kill, and the Upper New York Harbor south to the Narrows.

The results of the Harbor Survey (DEP 2007b) show that the water quality of New York Harbor has improved significantly since the 1970s as a result of measures undertaken by the city and others. These measures include infrastructure improvements, the cessation of raw sewage from New York City's WPCPs, the elimination of illegal discharges into the waterbody, and the reduction of CSOs (DEP 2008). The 1999 and 2000 IEC 305(b) reports also indicate that the year-round disinfection requirement for discharges to waters within its district (including New York Harbor) has contributed significantly to water quality improvements since the requirement went into effect in 1986 (IEC 2000, 2001).

Recent survey data (2003 through 2007) from the Harbor Survey station closest to the project site, off of West 42nd Street (Station N4), indicate that the water quality in this part of the lower Hudson River is good and meets the water quality standards for Use Classification I waters (see **Table 10-1**).

Temperature and salinity influence several physical and biological processes within the New York Harbor. 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. Salinity is also an important habitat variable as most aquatic species have salinity tolerances within particular ranges. Temperatures in the Hudson River measured near the project site during the Harbor Survey from 2003 to 2007 ranged from approximately 1.1 to 27.1°C (34 to 80.8°F [DEP 2007b]).

Salinity varies spatially within the Harbor Estuary depending on the amount of freshwater flow and tidal cycles. Within the New York-New Jersey Harbor Estuary system, average salinity values are highest in the Lower New York Harbor and Raritan Bay, and decrease moving up-estuary to the Upper New York Harbor, the lower Hudson River, and the lower East River. The Upper New York Harbor is partially stratified—higher salinity water originating from the Atlantic Ocean at the mouth of the estuary tends to remain near the bottom, while freshwater from the rivers draining to the estuary remains near the surface. Average salinity differences throughout the water column in the harbor are generally between 1 and 3 parts per thousand (ppt [USACE 1999]). From 2003 to 2007, surface water and bottom water salinities recorded in the Hudson River near the project site ranged from 1.2 to 23.3 ppt and 11.7 to 30.5 ppt, respectively.

Table 10-1
DEP Water Quality Data for the West 42nd Street Sampling Station (2003–2007)

Parameter—[*Class I Standard*]	Top Waters			Bottom Waters		
	Low	High	Avg	Low	High	Avg
Temperature (°C) [*No Standard*]	1.1	27.1	18.6	1.9	24.4	17.2
Salinity (parts per thousand) [*No Standard*]	1.2	23.3	12.7	11.7	30.5	22.4
Fecal coliform (colonies per 100mL) [*Monthly geometric mean less than or equal to 2,000 colonies/100 milliliters (mL) from five or more samples*]	1	1804	124.5	NM*	NM*	NM*
Dissolved oxygen (mg/L) [*Never less than 4 mg/L*]	4.6	13.6	7.8	4.2	12.3	6.6
Secchi transparency (ft) [*No Standard*]	0.5	6	3.2	NA	NA	NA
Chlorophyll *a* (µg/L) [*No Standard*]	0.8	49.4	5.6	NM	NM	NM

Notes: NM = not measured, NA = not applicable.
* = During the period of 2003-2007, only one measurement exists for Fecal Coliform, 2.0 colonies per 100 mL, sample taken on 9/22/2003
Source: DEP 2007b.

The presence of fecal coliform bacteria in surface waters indicates potential health impacts from human or animal waste, and elevated levels of coliform can result in the closing of bathing beaches and shellfish beds. According to the New York Harbor Water Quality Regional Summaries and data from the past five years (DEP 2007b), the waters of the Inner Harbor Area, meet the fecal coliform standard for Use Class I waters at most sampling locations. Temporary increases in fecal coliform concentrations may occur during wet weather due to increased fecal coliform loadings following a rain event. Overall, fecal coliform concentrations in this area have declined, significantly improving water quality from the early 1970s, when levels were well above 2,000 colonies/100 mL (DEP 2008). From 2003 to 2007, fecal coliform concentrations from the Hudson River station near the project site peaked as high as 1,804 colonies/100 mL but generally remained below 200 colonies/100 ml, averaging 124.5 colonies/100 mL (DEP 2007b).

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. 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. DO summer concentrations in the Inner Harbor Area have increased over the past 30 years from an average of bottom water that was below 3 mg/L in 1970 to above 6 mg/L in 2007, a value fully supportive of ecological productivity (DEP 2007b). For the period from 2003 to 2007, the average DO concentration of bottom water near the project site at the Hudson River station was 6.6 mg/L. All pH levels in the New York Harbor Area are in attainment, with the average being 7.5 at the West 42nd Street sampling station (DEP 2007b).

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. From 2003 to 2007, concentrations averaged 5.6 µg/L and only exceeded 20 µg/L seven times within

the five-year period (DEP 2007b). With DEP implementing its program to reduce nitrogen loadings from wastewater treatment plants, nitrogen discharges have decreased from these plants by over 30,000 pounds per day since 1993.

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. Average Secchi readings in the Inner Harbor area have remained relatively consistent, (>4.0 feet or >1.2 meters), since measurement of this parameter began in 1986. Average Secchi transparency recorded near the project site from 2003 to 2007 at the West 42nd Street station was 3.2 feet (1 meter) (DEP 2007b).

SEDIMENT QUALITY

While the sediments of the New York Harbor Estuary are contaminated, the levels of most sediment contaminants (e.g., dioxin, DDT, and mercury) have decreased over the past 30 years (Steinberg et al. 2002). Between 1993 and 1998, the percentage of sediment sampling locations with benthic macroinvertebrate communities considered impacted, or of degraded quality, decreased throughout the New York/New Jersey Harbor Estuary.

Complex flow patterns lead to widely variable sediment characteristics throughout the area. The primary constituents of Hudson River sediments are silt and clay (USACE 1999, EEA 1988). Typical of any urban watershed, New York Harbor Estuary sediments are contaminated due to a history of industrial uses in the area. Contaminants found throughout the New York Harbor Estuary include pesticides such as chlordane and DDT, metals such as mercury, cadmium, lead, and copper, polychlorinated biphenyls (PCBs) and various polycyclic aromatic hydrocarbons (Rohmann and Lilienthal 1987). Adams et al. (1998) found the mean sediment contaminant concentration for 50 of 59 chemicals measured in sediment samples from the New York/New Jersey Harbor Estuary to be statistically higher than other coastal areas on the East Coast. Biological effects, identified based upon the benthic invertebrate community, were found to be associated with the chemical contamination. While the sediments of the New York Harbor Estuary are contaminated, the levels of most sediment contaminants (e.g., dioxin, DDT, and mercury) have decreased on average by an order of magnitude over the past 30 years (Steinberg et al. 2002). Between 1993 and 1998, the percentage of sediment sampling locations with benthic macroinvertebrate communities considered impacted, or of degraded quality, decreased throughout the New York/New Jersey Harbor Estuary (Steinberg et al. 2004). Within the Upper Harbor, the percentage of benthic communities considered impacted decreased significantly from 75 percent in 1993 to 48 percent in 1998 (Steinberg et al. 2004).

AQUATIC BIOTA

The New York/New Jersey Harbor Estuary, including the lower Hudson River Estuary, supports a diverse and productive aquatic community of over 100 species of finfish, more than 100 invertebrate species, and a variety of phytoplankton and zooplankton. The Hudson River in the vicinity of the project site supports a number of existing operational and deteriorated piers and pile fields. These structures provide structurally complex potential habitat and protection to certain marine species, including algae, mussels, and barnacles, as well as clams, striped bass, summer and winter flounder, American eel, Atlantic herring, white perch, bay anchovy, tautog, Atlantic tomcod and other species. In addition, the older piers may provide habitat for a number of bird and other wildlife species, due to the lack of human activity in the area and their

proximity to water. The existing conditions of these natural resources in the vicinity of the project site are described below.

- Phytoplankton—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 New York Harbor are very high, low light penetration has often precluded the occurrence of phytoplankton blooms.
- Zooplankton—Zooplankton are an integral component of aquatic food webs—they are primary grazers on phytoplankton and detritus material, and are themselves used by organisms of higher trophic levels as food. The higher-level consumers of zooplankton typically include forage fish, such as bay anchovy, as well as commercially and recreationally important species, such as striped bass and white perch during their early life stages. Crustacean taxa (copepods *Acartia tonsa*, *Acartia hudsonica*, *Eurytemora affinis*, and *Temora longicornis*) dominate the zooplankton community, with the dominant species changing with the season (Stepien et al. 1981, Lonsdale and Cosper 1994, Perlmutter 1971, Lauer 1971, Hazen and Sawyer 1983, Pace and Lonsdale 2006).
- Benthic invertebrates—Benthic invertebrates live within the sediment and on the surfaces of hard substrates, such as pilings, rocks, and debris. Substrate type, including sediment grain size, primarily determines the type of benthic community present, along with current, salinity, and wave energy. The major groups of benthic invertebrates collected in the estuary include aquatic earthworms (oligochaetes), segmented worms (polychaetes), snails (gastropods), bivalves, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (EEA 1988, Coastal 1987, and PBS&J 1998). Bain et al. (2006) collected a total of 145 benthic invertebrate taxa within Hudson River Park between July 2002 and June 2004. Examples of abundant species include: the polychaetes *Mediomastus spp.*, *Streblospio benedicti*, *Leitoscoloplos spp.*, *Heteromastus sp.*, *Spio setosa*, and *Tharyx spp.*, and the bivalves *Mulinia lateralis* and *Tellina agilis*, oligochaetes, the gastropods *Acteocina canaliculata*, and *Rictaxis punctostriatus*, and the crustacean *Leucon americanus*.
- Fish—New York City is located at the convergence of several major river systems, all of which connect to the New York Bight portion of the Atlantic Ocean. This convergence has resulted in a mixture of habitats in the Harbor Estuary and lower Hudson River that support marine, estuarine, anadromous (fish that migrate up rivers from the sea to breed in freshwater), and catadromous fish (fish that live in freshwater but migrate to marine waters to breed). The fish community is dominated by marine species followed by estuarine and migratory species (Woodhead et al. 1992). **Table 10-2** lists fish species known to occur or to have occurred within the Harbor Estuary and have the potential to occur in the vicinity of the project site. Bain et al. (2006) collected 41 species of fish from within the Hudson River Park between June 2002 and June 2004, with Bay anchovy, Atlantic herring, striped bass, and blueback herring being the most abundant. The community composition of fish in the lower Hudson River varies seasonally and spatially across physical and chemical habitat gradients (Woodhead et al. 1992, Able et al. 1995, Able et al 1998, Daniels et al. 2005, Waldman 2006) with richness peaking from spring to summer and coinciding with the spawning migrations and production of many species. The near shore area of the lower Hudson River within the vicinity of the project site is comprised of open water habitat, piers, and pile fields and is considered nursery habitat for many species.

Table 10-2
Finfish Species With the Potential to Occur in the Vicinity of the Project Site

Common Name	Scientific Name
Alewife[(1)]	*Alosa pseudoharengus*
American eel[(1)]	*Anguilla rostrata*
American sand lance	*Ammodytes hexapterus*
American shad[(1)]	*Alosa sapidissima*
Atlantic cod	*Gadus morhua*
Atlantic croaker[(1)]	*Micropogonias undulatus*
Atlantic herring[(1)]	*Clupea harengus*
Atlantic mackerel	*Scomber scombrus*
Atlantic menhaden[(1)]	*Brevoortia tyrannus*
Atlantic moonfish	*Selene setapinnis*
Atlantic needlefish	*Strongylura marina*
Atlantic seasnail	*Liparis atlanticus*
Atlantic silverside[(1)]	*Menidia menidia*
Atlantic sturgeon	*Acipenser oxyrhynchus*
Banded killifish	*Fundulus diaphanous*
Bay anchovy[(1)]	*Anchoa mitchilli*
Black sea bass	*Centropristis striata*
Blackfish	*Tautoga onitis*
Blueback herring[(1)]	*Alosa aestivalis*
Bluefish[(1)]	*Pomatomus saltatrix*
Butterfish[(1)]	*Peprilus triacanthus*
Clearnose skate	*Raja eglanteria*
Conger eel	*Conger oceanicus*
Crevalle jack	*Caranx hippos*
Cunner[(1)]	*Tautogolabrus adspersus*
Fawn cusk eel	*Lepophidium cervinum*
Feather blenny[(1)]	*Hypsoblennius hentzi*
Fourbeard rockling	*Enchelypus cimbrius*
Foureye butterflyfish	*Chaetodon capistratus*
Four-spot flounder	*Paralichthys oblongus*
Gizzard shad[(1)]	*Dorosoma cepedianum*
Goosefish[(1)]	*Lophius americanus*
Grey snapper	*Lutjanus griseus*
Grubby[(1)]	*Myoxocephalus aenaeus*
Gulf Stream flounder[(1)]	*Citharichthys arctifrons*
Hickory shad[(1)]	*Alosa mediocris*
Hogchoker[(1)]	*Trinectes maculatus*
Inshore lizardfish	*Synodus foetens*
Lined seahorse[(1)]	*Hippocampus erectus*
Little skate	*Raja erinacea*
Longhorn sculpin	*Myoxocephalus octodecimspinosus*
Lookdown[(1)]	*Selene vomer*
Mummichog	*Fundulus heteroclitus*
Naked goby	*Gobiosoma bosci*
Northern stargazer[(1)]	*Astroscopus guttatus*
Northern kingfish[(1)]	*Menticirrhus saxatilis*
Northern pipefish[(1)]	*Syngnathus fuscus*
Northern puffer	*Sphoeroides maculatus*
Northern searobin[(1)]	*Prionotus carolinus*
Orange filefish	*Aluterus schoepfi*
Oyster toadfish	*Opsanus tau*
Planehead filefish	*Monacanthus hispidus*
Pollock	*Pollachius virens*
Rainbow smelt	*Osmerus mordax*
Red hake[(1)]	*Urophycis chuss*
Rock gunnel	*Pholis gunnellus*
Rock sea bass[(1)]	*Centropristis philadelphica*
Rough scad	*Trachurus lathami*

Table 10-2 (cont'd)
Finfish Species With the Potential to Occur in the Vicinity of the Project Site

Common Name	Scientific Name
Scup[(1)]	*Stenotomus chrysops*
Seaboard goby[(1)]	*Gobiosoma ginsburgi*
Sheepshead	*Archosargus probatocephalus*
Short bigeye	*Pristigenys alta*
Silver hake[(1)]	*Merluccius bilinearis*
Silver perch	*Bairdiella chrysoura*
Smallmouth flounder	*Etropus microstomus*
Spot[(1)]	*Leiostomus xanthurus*
Spotfin butterflyfish	*Chaetodon ocellatus*
Spotted hake[(1)]	*Urophycis regia*
Striped anchovy[(1)]	*Anchoa hepsetus*
Striped bass[(1)]	*Morone saxatilis*
Striped burrfish	*Chilomycterus schoepfi*
Striped cuskeel	*Ophidion marginatum*
Striped killifish	*Fundulus majalis*
Striped mullet	*Mugil cephalus*
Striped searobin[(1)]	*Prionotus evolans*
Summer flounder[(1)]	*Paralichthys dentatus*
Tautog	*Tautoga onitis*
Threespine stickleback	*Gasterosteus aculeatus*
Tomcod[(1)]	*Microgadus tomcod*
Weakfish[(1)]	*Cynoscion regalis*
White hake	*Urophycis tenuis*
White mullet	*Mugil curema*
White perch[(1)]	*Morone americana*
Windowpane[(1)]	*Scophthalmus aquosus*
Winter flounder[(1)]	*Pseudopleuronectes americanus*
Yellowtail flounder	*Limanda ferruginea*

Notes: [(1)] Collected within Hudson River Park by Bain et al. (2006) from June 2002 through June 2004.
Sources: Bain et al. (2006), Woodhead 1990; EEA 1988; EA Engineering, Science & Technology 1990; LMS 2003a, 2003b; Able et al. 1995.

RARE, SPECIAL CONCERN, THREATENED AND ENDANGERED SPECIES

Requests for information on rare, threatened, or endangered species within the immediate vicinity of the project site were submitted to USFWS, NOAA-NMFS and NYNHP. Appendix C-1 contains the responses received from NYSDEC (Salerno 2009) and NOAA-NMFS (Colligan 2009), and an online USFWS list of threatened and endangered species known for New York County (USFWS 2009).

The NMFS response indicates that the endangered shortnose sturgeon (*Acipenser brevirostrum*) may occur in the Hudson River within the vicinity of the project site. Atlantic sturgeon (*Acipenser oxyrinchus*), which is a candidate species for federal listing and a Species of Concern, may occur in the vicinity of the project site as a transient. The NYNHP response and the USFWS online list report the shortnose sturgeon (New York State and federally endangered) as potentially occurring within the vicinity of the project site. Below is a discussion of the status of these sturgeon species.

SHORTNOSE STURGEON

The federally and State-listed endangered shortnose sturgeon is a semi-anadromous bottom-feeding fish that can be found throughout the lower Hudson River in both tidal freshwater river

and brackish estuary habitats. Shortnose sturgeon spend most of their lives in the Hudson River Estuary and prefer cold, deep waters for all life stages—observations in coastal waters are rare (Bain et al. 2007). Spawning, development, and overwintering occurs well up-estuary of the project site (NYSDEC 2003a). The primary summer habitat for shortnose sturgeon is in the middle section of the Hudson River Estuary in the deep river channel (Peterson and Bain 2002). Multi-year sampling did not collect any shortnose sturgeon from interpier and underpier habitats in the lower Hudson River or the Hudson River Park specifically (EEA 1988, EA 1990, Meixler et al. 2003, Cornell University 2004). The Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 2004). Individuals are only expected to occur near the project site as transient individuals while traveling to or from Hudson River spawning, nursery, and overwintering areas.

The Hudson River shortnose sturgeon population was recently estimated to contain approximately 60,000 fish (Bain et al. 2007). These studies show that the population has increased more than 400 percent since the 1970s. Size and body condition of the fish caught in these studies indicate the population has characteristics typical of long-lived species and is primarily healthy adults. The successful recovery of this listed species has been suggested (Bain et al. 2007).

ATLANTIC STURGEON

The Atlantic sturgeon, a 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, NMFS 2007). In the Hudson River, Atlantic sturgeon are found in the deeper portions and do not occur farther upstream than Hudson, New York. Atlantic sturgeon migrate from the ocean upriver to spawn above the salt front from April to early July (Smith 1985, Stegemann 1999). Their diet consists largely of benthic organisms (including worms and amphipods), plants, and small fish (Bain 1997, NYSDEC 2010). 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).

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

NYSDOS has designated 15 Significant Coastal Fish and Wildlife Habitats within New York City, one of which—the Lower Hudson Reach—is within the vicinity of the project site. The Lower Hudson Reach is the portion of the Hudson River starting from Battery Park at the southern tip of Manhattan and extending north to Yonkers in the vicinity of Glenwood. This area runs for 19 miles and includes deep water, shallows, piers, and interpier basins. The Lower Hudson Reach was designated a Significant Coastal Fish and Wildlife Habitat because it provides an important wintering habitat for young-of-the-year, yearling, and older striped bass. Significant numbers of other fish species and waterfowl also use the Lower Hudson Reach (NYSDOS 1992). USFWS (1997) has also designated the Lower Hudson River Estuary (from the Battery at the southern tip of Manhattan up to Stony Point at river mile 41) as a Significant Habitat Complex because it is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine, and marine fish species, including striped bass, and is a migratory and feeding area for birds and fish that feed on the abundant fish and benthic invertebrate resources found in this portion of the estuary.

E. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the Future Without the Proposed Project and as described in greater detail in Chapter 1, Parcels L, M, and N could be developed with one of two scenarios—the 1992 FEIS project (No Build Scenario 1) or the 1992 FEIS project without development on Parcel N (No Build Scenario 2). Future conditions with these two No Build scenarios are described below.

NO BUILD SCENARIO 1

No Build Scenario 1 assumes that the program as examined in the 1992 FEIS would be constructed on the project site. This program would consist of two residential buildings, a large commercial building housing office and studio space, as well as some retail and cinema space, and 743 parking spaces.

Significant adverse impacts on groundwater, floodplain, wetlands and aquatic resources are not expected to occur as a result of construction or operation of the No Build Scenario 1. Groundwater in Manhattan is not used as a potable water supply. Consequently, No Build Scenario 1 would not affect drinking water supplies. Groundwater recovered during dewatering would be tested and pre-treated, if necessary, to ensure compliance with applicable DEP discharge requirements prior to discharge to the combined sewer.

The western portion of the project site is located within the 100-year floodplain, which is affected by coastal flooding. Unlike fluvial flooding, which is affected by activities within the floodplain of a river, coastal flooding is influenced by astronomic tide and meteorological forces and is not affected by activities within the floodplain. Therefore, development of the buildings within the project site as part of No Build Scenario 1 would not adversely affect flooding conditions within this portion of Manhattan. Any development that would occur within the project site would be consistent with the New York City Building Code requirement that residential buildings have a finished floor elevation (FFE) at or above the base flood elevation (BFE) for the 100-year flood, and would meet the minimum elevation requirements for the lowest floor relative to the design flood elevation (DFE) as specified in Appendix G: "Flood Resistant Construction," of the New York City Building Code (http://home2. nyc.gov/html/dob/downloads/pdf/cc_appendix_g. pdf) for the applicable building category (see Table 1604.5 of the *New York City Building Code* or Table 1-1 of Appendix G to the *New York City Building Code*). Compliance with Appendix G would minimize the potential for public and private losses due to flood damage, and reduce the exposure of public utilities to flood hazards associated with the development of No Build Scenario 1.

The 1992 FEIS discussed the potential for impacts on water quality and aquatic biota as a result of the proposed shoreline park. This element of the project has been constructed, so no further impacts would be expected to occur during construction and operation of parklands discussed in No Build Scenario 1. Because no construction activities would occur in or immediately adjacent to the Hudson River under either No Build Scenario, construction of the No Build Scenarios would not result in significant adverse impacts to wetlands, water quality and aquatic resources, Significant Coastal Fish and Wildlife Habitat, and threatened or endangered aquatic biotat of the Hudson River. Under No Build Scenario 1, the new separate sanitary and stormwater systems would be extended into all three parcels. Under the Amended Drainage Plan, the allowable flow to the new stormwater system would be about 28 cubic feet per second (cfs). Runoff from the 100-foot frontage along West End Avenue and West 59th Street (about 12 cfs) would be allowed to discharge to the combined sewer system. Implementation of a SWPPP, prepared in

accordance with the NYSDEC SPDES "General Permit for Stormwater Discharges from Construction Activity," Permit No. GP-0-10-001, would minimize the potential for discharge of stormwater generated within the project site to result in any significant adverse environmental impacts on DEC littoral zone tidal wetlands designated within the Hudson River, and to water quality, aquatic biota, Significant Coastal Fish and Wildlife Habitat and aquatic threatened or endangered species of the Hudson River.

A net increase in vegetated habitat (manicured lawns, plantings) for use by terrestrial fauna would occur, as the project site presently offers little in terms of vegetation or wildlife habitat. For No Build Scenario 1, the project site would be developed with three buildings that would range in height from 15 to 30 stories (approximately 180 to 360 feet). These structures would not be expected to be taller than surrounding structures, and would not be expected to present strike hazards for migratory birds during the spring and fall migratory periods. 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 low risk for bird collisions.

NO BUILD SCENARIO 2

In No Build Scenario 2, the original FEIS-approved program consisting of two residential buildings would be constructed on parcels L and M, but nothing would be constructed on Parcel N, and Parcel N would continue to be used for parking.

For the same reasons discussed above under No Build Scenario 1, No Build Scenario 2 would not result in significant adverse impacts to groundwater and floodplains.

The 1992 FEIS discussed the potential for impacts on water quality and aquatic biota as a result of the proposed shoreline park. This element of the project has been constructed, so no further impacts would be expected to occur during construction and operation of parklands discussed in No Build Scenario 2. As discussed under No Build Scenario 2, no construction activities would occur in or immediately adjacent to the Hudson River. Therefore construction activities would not result in significant adverse impacts to wetlands, water quality and aquatic resources, Significant Coastal Fish and Wildlife Habitat, and threatened or endangered aquatic biotat of the Hudson River.

In this scenario, the new separate sanitary and stormwater systems would be extended to Parcels L and M. However, the new separate sanitary and stormwater systems would likely not be extended to Parcel N, and runoff from that parcel would continue to flow into the combined system. Parcel N includes that portion of the site that would continue to flow into the combined system under the Amended Drainage Plan. As discussed under No Build Scenario 1, implementation of a SWPPP, prepared in accordance with the SPDES General Permit No. GP-0-10-001 would minimize the potential for discharge of stormwater generated within the project site to result in any significant adverse environmental impacts on DEC littoral zone tidal wetlands designated within the Hudson River, and to water quality, aquatic biota, Significant Coastal Fish and Wildlife Habitat and aquatic threatened or endangered species of the Hudson River.

The buildings on Parcel L and M would be the same as those for No Build Scenario 1 and would not be expected to present strike hazards for migratory birds during the spring and fall migratory periods.

Similar to No Build Scenario 1, a net increase in vegetated habitat (manicured lawns, plantings) for use by terrestrial fauna would occur, as the project site presently offers little in terms of vegetation or wildlife habitat. However, vegetated habitat would be placed in a slightly different configuration, as Parcel N would remain impervious surface for parking.

IMPACTS FROM AQUATIC RESOURCE IMPROVEMENT PROJECTS FOR BOTH NO BUILD SCENARIOS

In addition to the development of either No Build Scenario, 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 Hudson River Estuary near the project site.

NEW YORK/NEW JERSEY HARBOR ESTUARY PROGRAM PROJECTS

The New York/New Jersey Harbor Estuary Program (HEP) Final Comprehensive Conservation and Management Plan (CCMP) includes 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 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 HEP floatables action plan aims to reduce the amount of debris in the states' waters. It includes marine debris survey collection programs, improved street cleaning, CSO 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. The USACE New York District began a feasibility study in 2001 to assess potential sites for habitat restoration in New York Harbor (USACE 2004). In May 2003, the Regional Plan Association (RPA) identified needs and opportunities for environmental restoration in the Hudson-Raritan Estuary. These sites are not local to the project site but 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. The HEP Acquisition and Restoration Site Hudson River/Riverside Park is located in the Lower Hudson River Estuary along the Manhattan shoreline in the vicinity of the project site. It has been identified as a priority restoration site for reducing non-point source pollution. HEP actions taken with respect to this site, would occur with or without the Proposed Project.

NEW YORK CITY PROJECTS

As required by EPA's CSO Control Policy, DEP initiated the development of the Long Term Control Plan (LTCP) Project in 2004. The LTCP Project integrates CSO Facility Planning Projects and the Comprehensive City-Wide Floatables Abatement Plan, incorporates ongoing Use and Standards Attainment Program Project work, and develops Waterbody/Watershed Facility Plan Reports and the LTCP for each waterbody area. The LTCP Project monitors and assures compliance with applicable Administrative Consent Orders between NYSDEC 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 city issued the East River and Open Waters Waterbody/Watershed Facility Plan Report in 2007 (DEP 2007c), which includes the Hudson River. The "Hudson River—Manhattan" portion runs southwestward from the Harlem River to the Battery in lower Manhattan. Measures of the plan include: regulator improvements to be made to 123 regulators within the Inner Harbor study area for this Waterbody/Watershed Facility Plan, including gravity diversion around the Hannah

Street Pumping Station on Staten Island to reduce CSO discharges; continued upgrades to the headworks at Bowery Bay, Hunts Point, Newtown Creek, Tallman Island, and Wards Island WPCPS; a skimmer vessel fleet upgrade to be made to improve the City's Floatables Skimming Program; a Public Notification Program to be enhanced to increase the public's knowledge of CSOs; and DEP to continue coordination with other city Agencies to investigate and implement BMPs and Low Impact Development (LIDs) techniques. Elements of the plan within the Inner Harbor study area would be implemented by the 2018 Build Year (DEP 2007c).

STATE AND REGIONAL PROJECTS

The Hudson-Raritan Estuary Ecosystem Restoration Project (HRE) is a cooperative project being led by USACE that was funded by a House of Representatives Resolution on 15 April 1999. The Port Authority of New York/New Jersey (PANYNJ) is a co-sponsor of this project. Other agencies involved in this project include EPA, USFWS, NOAA, National Resource Conservation Service, New Jersey Department of Environmental Protection (NJDEP), New Jersey Department of Transportation (Office of Maritime Resources), NYSDEC, NYSDOS, DEP, DPR, and New Jersey Meadowlands Commission. The focus of the study is to 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 the waters of the New York/New Jersey Harbor and the tidally influenced portions of all rivers and streams that empty into the Harbor and ecologically influence the Harbor. The program has drafted a plan that presents an ecosystem approach to restoration of the estuary, guidance for selecting specific projects, measurable objectives called target ecosystem characteristics, and tracking of program performance. The program identifies measures and plans to restore natural areas within the estuary and to enhance their ecological value, and addresses habitat fragmentation and past restoration and mitigation efforts that were piecemeal in nature.

The project site is located within the Lower Hudson River Study Area where 10 sites have been identified as potential restoration projects. The Riverside Park/Hudson River site has been identified as a potential restoration project and is located just north of the project site. Restoration measures identified by HRE to enhance aquatic and nearshore terrestrial habitat within the Lower Hudson River Study Area include restoring/creating intertidal wetlands/mudflats, restoring benthic habitat, restoring fishery habitats, restoring/enhancing shoreline/coastal fringe habitats, creating/restoring/enhancing shallow water habitat, enhancing shorelines and stabilizing banks, water quality improvement, and environmental interpretation (USACE 2004). It is anticipated that expedited restoration of these representative restoration sites would provide substantial immediate value to the ecosystem.

NYSDEC and NJDEP, in coordination with the IEC, would continue to develop total maximum daily loads (TMDLs) and to identify priority waterbodies in bi-annual 305(b) reports to EPA. TMDLs, once implemented, would reduce the daily inputs of various contaminants in an effort to improve water quality.

F. THE FUTURE WITH THE PROPOSED PROJECT

GROUNDWATER

Significant adverse impacts on groundwater are not expected to occur as a result of construction or operation of the Proposed Project. Groundwater potentially affected by the project is not used

as a potable water supply in Manhattan. Consequently, the Proposed Project would not affect drinking water supplies.

Construction activities associated with the Proposed Project would involve both the demolition or disturbance of existing structures and a variety of earthmoving or excavating activities with the potential of encountering subsurface soil contamination. Groundwater depth is relatively shallow (i.e., at Elevation -2 to +4 feet MBD) and therefore may be encountered during earthmoving or excavation activities. Groundwater recovered during dewatering would be tested and pre-treated, if necessary, to ensure compliance with applicable DEP discharge requirements prior to discharge to the combined sewer.

As presented in Chapter 11, "Hazardous Materials," the results of soil sampling indicated the presence of contaminants within the project site, the level of which was consistent with the presence of historic urban fill. Although excavation for the Proposed Project may have the potential to result in adverse environmental impacts, implementation of the requirements associated with the updated Construction Health and Safety Plan (CHASP) and a new Remedial Action Plan (RAP), including contingency procedures for encountering petroleum or oil-contaminated soil and asbestos-containing serpentinite bedrock, would minimize the potential for significant adverse impacts on groundwater from the Proposed Project[1].

FLOODPLAINS

The western portion of the project site is located within the 100-year floodplain, which is affected by coastal flooding. Unlike fluvial flooding, which is affected by activities within the floodplain of a river, coastal flooding is influenced by astronomic tide and meteorological forces and is not affected by activities within the floodplain. Therefore, the Proposed Project would not adversely affect flooding conditions within this portion of Manhattan.

All five of the proposed buildings within the project site would be constructed on a platform at about the elevation of the West End Avenue grade, which is at least 15 feet above the BFE for the 100-year flood[2]. Therefore, any development that would occur within the project site would be consistent with the New York City Building Code requirement that residential buildings have a FFE at or above the BFE for the 100-year flood, and would meet the minimum elevation requirements for the lowest floor relative to the DFE as specified in Appendix G: "Flood Resistant Construction," of the New York City Building Code (http://home2.nyc.gov/html/dob/downloads/pdf/cc_appendix_g. pdf) for the applicable building category (see Table 1604.5 of the *New York City Building Code* or Table 1-1 of Appendix G to the *New York City Building Code*). The below-grade area below the platform for these structures would be waterproofed and designed to withstand the hydrostatic pressure exerted by groundwater during a 100-year flood event, consistent with the Appendix G of the *New York City Building Code*. For these reasons, the Proposed Project would minimize the potential for public and private losses due to flood damage, and reduce the exposure of public utilities to flood hazards.

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[1] Although the mitigation measures that will be outlined in the updated CHASP and new RAP will be similar to those of the previously approved HASP, the updated documents would include additional measures that would conform to new regulations and guidelines published since 1996, including 6 NYCRR Part 375, Subparts 375-1 to 375-4 and 375-6.

[2] At the project site the BFE for 100-year flood is 10 feet National Geodetic Vertical Datum of 1929)

Projections of sea-level rise, changes in 100-year flood elevation, and reduction of the 100-year flood return period have been generated by the New York City Panel on Climate Change (NPCC, 2009). The *Climate Risk Information* report released by the NPCC, was prepared as part of PlaNYC, the city's comprehensive sustainability plan, to advise the Mayor and the New York City Climate Change Adaptation Task Force on issues related to potential impacts on infrastructure due to climate change (i.e., temperature, precipitation, and rising sea levels). Projections for New York City were developed using Intergovernmental Panel on Climate Change (IPCC)-based methods to generate model-based probabilities for sea level rise in the 2020s, 2050s and 2080s from global climate model (GCM) simulations based on three Greenhouse Gas (GHG) emission scenarios developed by the IPCC[1]. The methods used to project sea level rise for the New York City region included global expansion of the oceans due to warming, meltwater from glaciers, ice caps, and ice sheets, and local land subsidence and water surface elevation. In addition to the IPCC approach to sea level rise, the NPCC also employed an alternative "rapid ice-melt" approach which is based on an extrapolation of recent accelerating rates of ice melt from Greenland and West Antarctic ice sheets and paleoclimate studies that suggest sea level rise on the order of approximately 0.39 to 0.47 inches per decade may be possible.

Current rates of sea level rise[2] in New York City range between 0.86 and 1.5 inches per decade. The long-term rate since 1900 averages 1.2 inches per decade. The NPCC report projects a sea level rise in New York City for the 2020s period (i.e., a 30-year period extending from 2010 to 2039), the period applicable to the 2018 build year, of 2 to 5 inches based on GCM simulations.[3]

The placement of the elevation of the lowest floor of the five proposed buildings on a platform that is at the same grade as West End Avenue, which is at least 15 feet above the current BFE for the 100-year flood, would result in the elevation of the lowest floor that would still be at about 14 feet above the NPCC projected flood elevation associated with the current 100-year storm event in the 2020s due to sea level rise. Therefore, the design for these structures would reduce the potential for public and private loses due to flood damage under current and projected flood conditions.

WETLANDS

The Proposed Project would not result in construction activities within or immediately adjacent to the Hudson River that would have the potential to affect NYSDEC littoral zone tidal wetlands within the lower Hudson River. The western boundary of the project site is approximately 200 feet inland from the Hudson River shoreline. Activities associated with construction and operation of the Proposed Project would comply with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-10-001. A SWPPP would be prepared, and a Notice of Intent (NOI) would be submitted to NYSDEC. The SWPPP would conform to all of the requirements of GP-0-10-001, NYSDEC's technical standard for erosion and sediment control presented in "New York Standards and Specifications for Erosion and

[1] IPCC Special Report on Emissions Scenarios (SRES) (IPCC, 2000).

[2] Observed current rates of sea level rise over the past century can be attributed to regional subsidence of the earth's crust and expansion of the oceans as they warm due to global increases in temperature (NPCC, 2009).

[3] Range of projected sea level rise represents middle 67 percent of values from model-based probabilities to the nearest inch, as presented in *Climate Risk Information*, New York City Panel on Climate Change, February 17, 2009.

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 *New York State Stormwater Management Design Manual* (NYSDEC 2003b). The SWPPP would include Best Management Practices (BMPs) to be implemented on-site during and after construction such as erosion and sediment control measures, and stormwater management measures identified in the SWPPP would minimize potential impacts on littoral zone tidal wetlands within the Hudson River associated with discharge of stormwater runoff generated within the project site during the construction and operation of the Proposed Project. Consequently, the Proposed Project would not result in any significant adverse impacts on wetlands.

TERRESTRIAL RESOURCES

As described above, the shoreline parkland to the west of the site, Riverside Park South, has been developed and is open for public use. The Proposed Project would also include approximately 2.75 acres of privately owned, publicly accessible open space that was not included in the program evaluated in the 1992 FEIS for the project site. As currently envisioned, the open space area would include a 1.2-acre plaza with a fountain, and a scrim of water extending west from the plaza surrounded by landscaping. Trees would line both sides of the scrim and benches would line the southern path to allow users to face the water scrim and lawn to the north. Paths would crisscross to create a pedestrian network linking the large open space to sidewalks at the periphery of the site. A lawn area would be located north of the scrim, while a rolling meadow would be located south of the scrim. A dense planting of trees would provide filtered views and a visual buffer to the West Side Highway. Landscaping vegetation within the proposed open space areas would provide higher quality habitat for wildlife than currently found within the project site, which would not be available under either of the two No Build Scenarios. Therefore, a net increase in vegetated habitat would result from the Proposed Project.

The project site is located within the boundaries of a state and federal quarantine zone for the Asian Longhorned Beetle, an invasive pest that colonizes woody plant species, and which is currently the subject of a concentrated eradication effort in the New York/New Jersey Harbor area. Therefore, no woody plant species that are known to be Asian Longhorned Beetle host species would be planted as a result of the landscape design for the Proposed Project.

The Proposed Project would be developed with five buildings with the following heights:

- Building 1—approximately 487 feet (38 stories plus mechanical levels);
- Building 2—approximately 526 feet (43 stories plus mechanical levels);
- Building 3—approximately 456.5 feet (34 stories plus mechanical levels);
- Building 4—approximately 393 feet (31 stories plus mechanical levels); and
- Building 5—approximately 535 feet (44 stories plus mechanical levels).

New York City is a major migratory route and stopover site along the Atlantic Flyway, a major migratory route for neotropical migrant songbirds (i.e., migratory bird species that breed in North America and winter in the Caribbean, Mexico, and Central/South America) and shorebirds in the New York Bight Watershed. Surveys of migrating birds in open spaces in the New York City metropolitan area have revealed a high abundance and diversity of such birds (Elbin, 2008). The rate of migratory movement through an urban area can be remarkable; over the course of a few hours during spring migration, over 50 million birds were detected passing over the southern

U.S. during peak movement (Evans Ogden, 1996). Many bird species passing through the city during spring and fall are nocturnal migrants (Evans Ogden, 1996).

Migration altitudes vary depending on species, location, geographic features, season, time of day, and weather (Evans Ogden 1996). Approximately 75 percent of neotropical migratory birds fly at altitudes between 500 and 6,000 feet during migration (Gill, 1990; Able, 1999). Shorebirds generally migrate at altitudes of between 1,000 and 13,000 feet. Tall buildings and other structures are known to present strike hazards for many birds, especially those migrating along major routes, such as the Atlantic Flyway. In the U.S., instances of bird mortality due to building window strikes has been estimated at 97 million to 976 million bird deaths per year or more (Klem, 1990, USFWS, 2002, Hager et al., 2008). While bird mortality associated with an individual building may appear low, the cumulative loss due to building collisions along the Atlantic Flyway may be an important source of mortality for migratory songbirds. Breeding and migratory bird species have been recorded as window strike casualties in the New York City area during nighttime and daytime periods (Seewagen, 2008).

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 for Buildings 2 and 5 (526 to 535 feet), which would be taller than the maximum heights of surrounding structures (i.e., 31 to 39 stories, up to approximately 400 feet tall), suggest that these buildings would pose a risk for bird losses due to building strikes that is greater than for the two No Build Scenarios. Building height, nighttime lighting, and the reflective nature of glass façades would affect the potential for the proposed buildings to result in collisions by birds migrating at night (Schmidt-Koenig, 1979, Evans Ogden, 1996, Avery et al., 1976 in Evans Ogden, 1996, Martin, 1990 in Evans Ogden, 1996). External and internal illumination of buildings has also been shown to result in an increased potential for bird mortality due to nighttime building collisions (FLAP, 2009). Most species of migratory birds use the stars to navigate at night, and brightly illuminated buildings and broadcast towers can attract birds, particularly when poor weather conditions cause birds to fly at lower altitudes. While the proposed building heights may result in adverse impacts on migratory songbirds due to nighttime building collisions, the building heights are comparable to buildings elsewhere in Manhattan, and these losses would not be expected to result in significant adverse impacts on bird populations migrating through New York City. To minimize the potential for nighttime bird collisions, consideration would be given to incorporating measures to reduce the potential for migratory bird strikes, such as those outlined in the New York City Audubon *Bird-Safe Building Guidelines* (Audubon, 2008).

Buildings with glass surfaces also have the potential to result in losses of migratory songbirds during daylight hours. During daylight hours, window strikes are generally greatest in the zone closest to the base of a structure (i.e., approximately the first 40 feet or within first seven floors, [New York City Audubon, 2008]). For daylight collisions, building and landscape design are important factors in collisions. Highly reflective surfaces, such as glass curtain walls, are known to play an important role in bird collisions (Klem, 2006). Locating landscaping within 1 to 33 feet of the building, use of reflective glass, and the presence of highly visible indoor plants behind clear glass have been found to affect the potential for buildings to result in daytime bird strikes (Klem, 1990). To minimize the potential for daytime collisions, consideration would be given to incorporating measures to reduce the potential for resident bird strikes, such as those outline in the New York City Audubon *Bird-Safe Building Guidelines* (Audubon, 2008).

AQUATIC RESOURCES

No construction activities would occur in or immediately adjacent to the Hudson River as a result of the Proposed Project. The western boundary of the project site is approximately 200 feet inland from the Hudson River shoreline. As discussed under "Wetlands," activities associated with construction and operation of the Proposed Project would comply with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-10-001). 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 Project would minimize potential impacts on water quality and aquatic biota of the Hudson River associated with the discharge of stormwater runoff generated within the project site. Construction activities would include demolition of existing structures, debris removal, excavation activities for site grading, and foundation work and placement of utilities. As discussed under "Groundwater," any hazardous materials encountered during construction activities would be handled and removed in accordance with the updated CHASP and new RAP prepared for the Proposed Project. With the implementation of these measures and the SWPPP prepared for the Proposed Project, construction of the Proposed Project would not result in significant adverse impacts on Hudson River water quality.

As discussed in Chapter 6, "Shadows," incremental shadows generated by the Proposed Project would not have a significant adverse impact on primary productivity of aquatic resources within the Hudson River.

As discussed in Chapter 13, "Inftrastructure," although additional discharge of sanitary sewage would occur with the additional residential and commercial development when compared with the No Build Scenarios, the incremental increase (0.81 mgd) is small and would not be expected to cause the North River WPCP to be above its permitted daily flow limit of 170 mgd, or adversely affect compliance of the North River WPCP effluent with the SPDES permit limits. Consistent with the project as evaluated in the 1992 FEIS, new sanitary sewers would be extended to the project site. The discharge of the incremental increase in sanitary sewage from the Proposed Project to existing trunk and interceptor sewers would not change the conclusion of the 1992 FEIS that no significant adverse impacts on the sanitary sewer system would result from the development of the Riverside South project.

As discussed in Chapter 13, "Infrastructure," the Proposed Project would not result in an increase in the portion of the project site covered by impervious surface, and would not result in an increase in stormwater runoff generated within the project site. Under the existing condition, stormwater runoff from the project site is discharged to the combined sewer system. As part of the 1992 FEIS, an Amended Drainage Plan was reviewed and approved by DEP. The Amended Drainage Plan established a separate stormwater system serving Parcels L, M, and N, except for 100 feet of street frontage along West End Avenue and West 59th Street. Based on the Amended Drainage Plan, the allowable flow into the stormwater system would be approximately 28 cubic feet per second (cfs). In accordance with the Amended Drainage Plan, the new storm sewer will be constructed in the street bed of 61st Street, to serve the parcels north of 61st Street (Parcels K1 and K2) and the development on Parcels L, M and N, south of 61st Street. An additional new storm sewer will be extended south along Riverside Boulevard (to approximately the location of the West 60th Street extension to the east) once development occurs on the northwest portion of the project site. These new storm sewers will connect to the separate stormwater system that is currently in place, which discharges into the Hudson River through the existing DEP outfall at the street end of 66th Street, downstream of Regulator NR-N29A (which is in the street bed of West 66th Street at Freedom Place). With the Proposed Project, Parcels L, M, and N would be

served by this separate stromwater system, and additional on-site stormwater detention would be in place on the Project Site. This would allow the runoff from the 100-foot deep area fronting along West End Avenue and West 59th Street (that under the Amended Drainage Plan would enter the combined system), to instead be detained and discharged into the separate stormwater system, while maintaining the allowable flow of 28 cfs into the separate stormwater system. Therefore, no runoff from the project site would be discharged into the combined sewer system.

Volumes to the combined sewer system are expected to increase due to the projected sanitary volumes, which during certain storm events, may exacerbate CSO volumes into the Hudson River. However, with new separate storm sewers, additional water conservation and stormwtaer management measures, and the considerable assimilative capacity of the Hudson River to quickly disperse pollutants, no significant adverse impacts on the aquatic resources of the Hudson River are expected to occur from the Proposed Project.

The implementation of these stormwater management measures is anticipated to result in an improvement in the quality of stormwater runoff from the project site. Management of the landscaped portions of the open space areas within the project site would include implementation of an Integrated Pest Management (IPM) strategy to minimize use of fertilizers, pesticides, and herbicides, in accordance with DPR policies. With the implementation of stormwater BMPs and IPM strategy, the discharge of stormwater from the project site would not result in significant adverse impacts on the aquatic resources of the Hudson River.

RARE, SPECIAL CONCERN, THREATENED AND ENDANGERED SPECIES

Only shortnose and Atlantic sturgeon were recognized as potentially occurring in Hudson River waters within the study area. The preference of shortnose and Atlantic sturgeon for deep water habitat suggests that it is unlikely that individuals of either species would occur in the study area of the project site for extended periods of time. Although shortnose sturgeon have been collected from the Hudson River channel south of the George Washington Bridge during recent winter sampling of the channel in 2003-2004 and 2004-2005, the numbers collected were low. Because no construction activities would occur in or immediately adjacent to the Hudson River as a result of the Proposed Project, and the Proposed Project would not result in significant adverse impacts on water quality of the Hudson River, shortnose and Atlantic sturgeon would not be adversely impacted by the Proposed Project.

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

The Lower Hudson Reach has been identified as a Significant Coastal Fish and Wildlife Habitat primarily because of its use by large numbers of juvenile striped bass as wintering habitat. As described above, the Proposed Project does not include any construction activities in or immediately adjacent to the Hudson River that would directly impact overwintering striped bass or coastal fish and wildlife habitat. Furthermore, the Proposed Project is not expected to result in significant adverse impacts on water quality. Therefore, the Proposed Project would not result in significant adverse impacts on Significant Coastal Fish and Wildlife Habitats.

G. REFERENCES

See Appendix C-2 for sources cited within this document. ✷