

A. INTRODUCTION

This chapter assesses the potential for impacts to natural resources from implementation of the proposed Plan and the No Convention Center Scenario in the Willets Point Development District (the District). In accordance with the approach outlined in Chapter 2, “Procedural and Analytical Framework,” this chapter also considers potential impacts from the anticipated development on Lot B. The District is approximately 61.4 acres in size, and contains a mixture of automotive repair and auto body shops, junkyards, wholesalers, manufacturing, construction companies, and other auto-related retail establishments. The site is largely developed, with few natural areas.

The purpose of this chapter is to:

- Identify and describe the City, State, and federal regulatory programs that may apply to the proposed Plan with respect to natural resources;
- Describe existing natural resources (e.g., plants, wildlife, and threatened or endangered species) on the Plan site; and
- Assess the probable impacts of the proposed Plan on natural resources on the Plan site, and in adjacent areas.

Both the proposed Plan and the No Convention Center Scenario would result in the construction of up to 8.94 million gross square feet (gsf) of new buildings, which would include a mix of residential, retail, hotel, convention center, entertainment, commercial office, cultural, community facility, open space, and parking uses.

PRINCIPAL CONCLUSIONS

The chapter concludes that neither the proposed Plan nor the No Convention Center Scenario would result in significant adverse impacts on terrestrial natural resources, wetlands, aquatic resources, endangered species, threatened species, or species of special concern. Development under either scenario would offer benefits to natural resources, including improved habitat for birds and other wildlife within the new District open spaces. In addition, the proposed Plan and No Convention Center Scenario are likely to include sustainable design elements such as green roofs, onsite storage and treatment facilities, graywater recycling, and bioswales, which would be developed as part of the Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) certification effort. These sustainable design features would provide additional benefits to natural resources in and around the District.

METHODOLOGY

Existing conditions within the District were summarized from information identified in literature sources. Sources included the following documents (reports and maps):

Willets Point Development Plan

- United States Geological Survey (USGS)—Topographic quadrangle map for Central Park Quad;
- New York State Department of Environmental Conservation (DEC)—Breeding Bird Atlas, Bird Conservation Areas, Critical Environmental Areas;
- Aerial photographs;
- United States Fish and Wildlife Service (USFWS [NY office]), National Marine Fisheries Service (NMFS), and New York Natural Heritage Program (NYNHP)—Information on rare, threatened, or endangered species within the vicinity of the District. A study area of a ½-mile radius around the Plan site was assessed and included an evaluation of both terrestrial and aquatic resources.

The future conditions without the proposed Plan were assessed by considering existing natural resources within the District and assessing potential effects on these resources from projects proposed within the ½-mile study area of the District that are expected to occur independent of the proposed Plan by 2017, the proposed Plan's Build year.

Potential impacts on natural resources from the proposed Plan were assessed by considering the existing and expected future natural resources within and in the vicinity of the District and the potential changes in terrestrial and aquatic habitats that would occur as a result of the proposed Plan.

B. REGULATORY CONTEXT

The following section briefly describes the federal and state laws and associated regulations and regulatory programs that may apply to the proposed Plan with respect to terrestrial and aquatic resources that are found within the study area. The regulations apply to the protection of wildlife and species of special concern, and stormwater management.

FEDERAL

CLEAN WATER ACT (33 USC §§ 1251 TO 1387)

The objective of the Clean Water Act (CWA), 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 or the discharge of dredged or fill material into waters of the United States. It also regulates non-point source pollution, such as runoff from streets and construction sites that enters waterbodies from other than the end of a pipe.

Section 404 of the Act requires authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), for the permanent or temporary discharge of dredged or fill material into waters of the United States. Waters of the United States is defined in 33 Code of Federal Regulations (CFR) 328.3 and includes wetlands, mudflats, and sandflats that meet specified requirements in addition to streams and rivers that meet the specified requirements. Activities authorized under Section 404 must comply with Section 401 of the Act.

Under Section 401 of the Act, any applicant for a federal permit or license for an activity that may result in a discharge to waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge would occur or from an interstate water

pollution control agency, that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the CWA. Applicants for discharges to waters in New York must obtain a Water Quality Certification from DEC.

COASTAL ZONE MANAGEMENT ACT OF 1972 (16 USC §§ 1451 TO 1465)

The Coastal Zone Management Act of 1972 established a voluntary participation program to encourage coastal states to develop programs to manage development within 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.

EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

Executive Order 11988 states that "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities."

ENDANGERED SPECIES ACT OF 1973 (PL 93-205; 16 USC 1531 ET SEQ.)

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 Act prohibits the importation, exportation, taking, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival. The USFWS (non-marine plants and animals) and National Marine Fisheries Service ([NMFS] marine plants and animals) are responsible for administering the Act. Section 7(a) of the Act requires federal agencies to consult with the Secretary of the Interior (through USFWS and/or NMFS) before project implementation to ensure that the proposed action will not jeopardize a species, or destroy or adversely modify the designated critical habitat of the species. Threatened, endangered, and special concern species with the potential to occur in the study area are discussed in Sections C and E, "Existing Conditions" and "Probable Impacts of the Proposed Plan."

NEW YORK STATE

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES), ARTICLE 17 TITLE 8, NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW (ECL), IMPLEMENTING REGULATIONS 6NYCRR PARTS 750 THROUGH 757

Title 8 of Article 17, ECL, Water Pollution Control, authorized the creation of the SPDES to regulate discharges to the State's waters. Activities requiring a SPDES permit include discharges from pipe (point source) that discharges wastewater 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.

PROTECTION OF WATERS, ARTICLE 15, TITLE 5, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 608

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

FRESHWATER WETLANDS, ARTICLE 24, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PARTS 663, 664, AND 665

Freshwater wetlands regulations apply to lands and submerged lands, commonly called marshes, swamps, sloughs, bogs, and flats, which support aquatic or semi-aquatic vegetation. Freshwater wetlands are ecological areas necessary for flood control, surface and groundwater protection, wildlife habitat, open space, and water resources. DEC is responsible for administering the freshwater wetlands regulatory program (6 NYCRR Part 663, 664, and 665) and mapping the locations of the State's regulated wetlands. Freshwater wetlands are classified according to their respective functions, values, and benefits. For protection under the Freshwater Wetlands Act, a wetland must be 12.4 acres or larger. Smaller wetlands may be protected when the Commissioner determines a wetland has unusual local importance in providing one or more of the functions described in Article 24 of the ECL. A permit is required for almost any activity that alters wetlands or adjacent areas (extending 100 from the wetland boundary).

TIDAL WETLANDS, ARTICLE 25, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 661

Tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis. They are found along much of the saltwater shore, bays, inlets, canals, and estuaries of Long Island, New York City, and Westchester County. DEC is responsible for administering the tidal wetlands regulatory program (6 NYCRR Part 661) and mapping the locations of New York State's regulated tidal wetlands. The tidal wetlands are identified by category based on the types of vegetation and the presence of tide. Each category has restrictions on activities allowed in and adjacent to (up to 300 feet inland from wetland boundary, or up to 150 feet inland within the City) wetlands falling under that category. A permit is required for almost any activity that will alter wetlands or the adjacent areas. Wetlands within the study area are described below in "Existing Conditions."

WATERFRONT REVITALIZATION OF COASTAL AREAS AND INLAND WATERWAYS ACT (SECTIONS 910-921, EXECUTIVE LAW, IMPLEMENTING REGULATIONS 6 NYCRR PART 600 ET SEQ.)

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

The New York CMP has specific policies with respect to fish and wildlife. Policy 7 specifies that Significant Coastal Fish and Wildlife Habitats be protected, preserved and—where practical—restored, so as to maintain their viability as habitats. DEC is responsible for evaluating the significance of coastal habitats and evaluating their relative habitat values. NYSDOS designates and maps the Significant Coastal Fish and Wildlife Habitat areas. Neither land/water uses nor development activities may be undertaken that destroy the designated habitat through direct or indirect means. These uses or activities may not significantly impair the viability of the habitat by reducing vital resources beyond the tolerance range of important species of fish or wildlife that rely on the habitat, such as physical parameters (circulation, flushing rates, turbidity, or depth); biological parameters (community structure or predator/prey relationships); and chemical parameters (dissolved oxygen, carbon dioxide, nutrients, salinity and pollutants). Chapter 13, “Waterfront Revitalization Program,” describes the project’s consistency with each of the Program’s coastal policies.

FLOODPLAIN MANAGEMENT CRITERIA FOR STATE PROJECTS (6 NYCRR 502)

Under 6 NYCRR 502, all New York State agencies are to ensure that the use of State lands and the siting, construction, administration, and disposition of State-owned and State-financed projects involving any change to improved or unimproved real estate are conducted in ways that will minimize flood hazards and losses. Projects are to consider alternative sites on which the project could be located outside the 100-year floodplain. Projects to be located within the floodplain are to be designed and constructed consistent with the need to minimize flood damage within the 100-year floodplain and include adequate drainage to reduce exposure to flood hazards. All public utilities and facilities associated with the project are to be located and constructed to minimize or eliminate flood damage. The regulations specify that for residential structures and substantial improvements of existing residential structures, the lowest floor (including the basement) should be elevated to not less than one foot above the base flood level. For nonresidential structures, the lowest floor should be elevated or floodproofed to not less than one foot above the base flood level so that below this elevation the structure, together with associated utility and sanitary facilities, is watertight, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. No project may be undertaken unless the cumulative effect of the proposed project and existing developments would not cause material flood damage to the existing developments. In cities with a designated floodway, no portion of the project may be placed within the adopted regulatory floodway to result in any increases in flood levels.

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 take, import, transport, possession, or selling of any endangered or threatened species of fish or wildlife, or any hide or other part of these species as listed in Section 182.6.

C. EXISTING CONDITIONS

The approximately 61.4 acre District is a developed industrial area containing approximately 250 businesses—a mixture of automotive repair and related businesses, junkyards, wholesalers, manufacturing, and construction companies. The entire District is relatively level with less than 15 feet of elevation variation. Lot B is currently being used as a construction staging area for Citi Field. The nearest waterbodies to the District and Lot B are the Flushing River to the east and Flushing Bay to the north.

TERRESTRIAL RESOURCES

VEGETATION

The District contains areas of rubble, unpaved roads, successional plant communities characteristic of those that develop on urban vacant lots. At present, there are little to no plants of significance on the site. There are few trees within the District, and these are generally limited to Northern Boulevard. The vegetation species found on the site are generally fast-growing and tolerant of harsh urban environments. There are no grassy areas in the District. Lot B contains some grass along the southern boundary near Roosevelt Avenue.

WILDLIFE

Wildlife likely to utilize the District and Lot B include those species generally tolerant of urban conditions. Table 11-1 lists birds identified as breeding within the New York State Breeding Bird Atlas Block 5951C (2000 and 2005), which contains the District, and that have the potential to breed in successional vacant lot habitats within New York City. Other wildlife tolerant of urban conditions with the potential to occur in the District or Lot B include rats, mice, and squirrels.

GEOLOGY AND SOILS

The Willets Point peninsula is situated near the westernmost end of Long Island. Soils on the site consist primarily of fill material. The regional stratigraphy of Long Island, including the aquifers and confining layers, was formed from glacial tills and outwash sands of the Pleistocene Epoch. These layers lie unconformably over older deposits of the Cretaceous Period. The Cretaceous deposits lie over an impermeable bedrock surface dipping to the southeast. The bedrock consists of crystalline metamorphic rock of the lower Paleozoic Era. Local aquifers that supply or have the potential to supply groundwater for consumption or industrial uses consist primarily of the late Cretaceous and Pleistocene sands and gravels (HDR/LMS, 2005).

GROUNDWATER

A Phase II environmental site investigation carried out in 2005 indicated that the depth to groundwater in the District varied. Testing revealed that groundwater at the southern edge of the site is approximately five feet below grade. On the northern end of the site, groundwater was encountered at greater depths [typically between eight and nine feet below ground surface (bgs)]. Tidal influences are generally local and only affect areas very close to shorelines. Environmental contamination observed here was found to be typical for the current automotive and industrial uses of the area and most likely impacted only the shallow groundwater (HDR/LMS, 2005).

Table 11-1

Birds with the Potential to Breed Within the District

Common Name	Scientific Name
Confirmed Breeders	
Canada Goose	<i>Branta canadensis</i>
Wood Duck	<i>Aix sponsa</i>
Mallard	<i>Anas platyrhynchos</i>
Rick-necked Pheasant	<i>Phasianus colchicus</i>
Killdeer	<i>Charadrius vociferous</i>
Rock Pigeon	<i>Columba livia</i>
Mourning Dove	<i>Zenaida macroura</i>
Chimney Swift	<i>Chaetura pelagica</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Northern Flicker	<i>Colaptes auratus</i>
Warbling Vireo	<i>Vireo gilvus</i>
Blue Jay	<i>Cyanocitta cristata</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Barn Swallow	<i>Hirundo rustica</i>
American Robin	<i>Turdus migratorius</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
European Starling	<i>Sturnus vulgaris</i>
Cedar Waxwing	<i>Bombycilla cedrorum</i>
Song Sparrow	<i>Melospiza melodia</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Baltimore Oriole	<i>Icterus galbula</i>
House Sparrow	<i>Passer domesticus</i>
Sources: NYSDEC. New York State Breeding Bird Atlas [Internet]. 2006 [cited 2007 Jun 06]. Available from: http://www.dec.ny.gov/animals/7312.html	

The District is within an area designated as a sole source aquifer, the Brooklyn-Queens Aquifer System, located in Queens and King (Brooklyn) counties. The East River forms part of the western boundary for this aquifer system. The Jamaica Water Supply Company supplies water from wells located in or near the water supply franchise area to the southern portion of Queens County. The wells in service draw drinking water primarily from the Upper Glacial, Post Jameco, and Magothy aquifers. Groundwater is not used as a source of drinking water in the portion of Queens where the District is located.

FLOODPLAINS AND WETLANDS

The District was once a salt marsh area that was a part of the large salt meadow known as Flushing Meadow. Today, the site contains predominantly fill, and is mostly developed. Figure 11-1 presents the 100-year (area with a 1 percent chance of flooding each year) and 500-year (area with a 0.2 percent chance of flooding each year) floodplain boundaries in relation to the District. As shown, the 100-year floodplain covers a majority of the District, all of Lot B, and

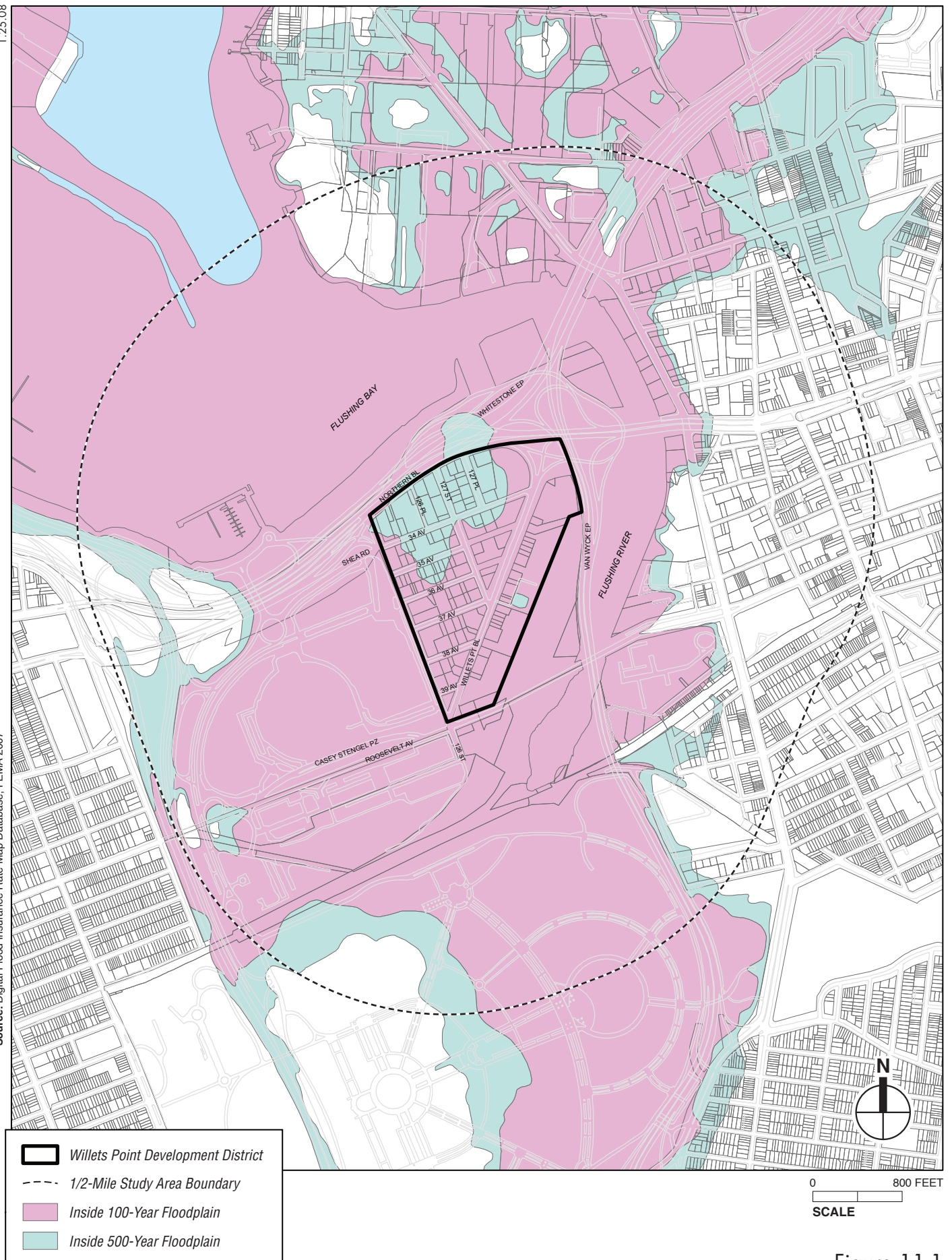


Figure 11-1
100 and 500 Year Floodplain

nearly the entire ½-mile study area surrounding the District; flooding is common during heavy rain storms. The 500-year floodplain covers the northern portion of the District.

There are no freshwater or tidal wetlands mapped by the DEC (Figure 11-2) or USFWS National Wetland Inventory (Figure 11-3) within the District or Lot B. High and intertidal marshes, as identified by DEC, exist east of the District, on the Flushing River. Two USFWS wetlands (E2EM1P and PUBZ) also exist east and south of the site, respectively, on the Flushing River. Specifically, the District and Lot B are more than 180 feet away from the E2EM1P wetland area and more than 165 feet away from PUBZ wetland area.

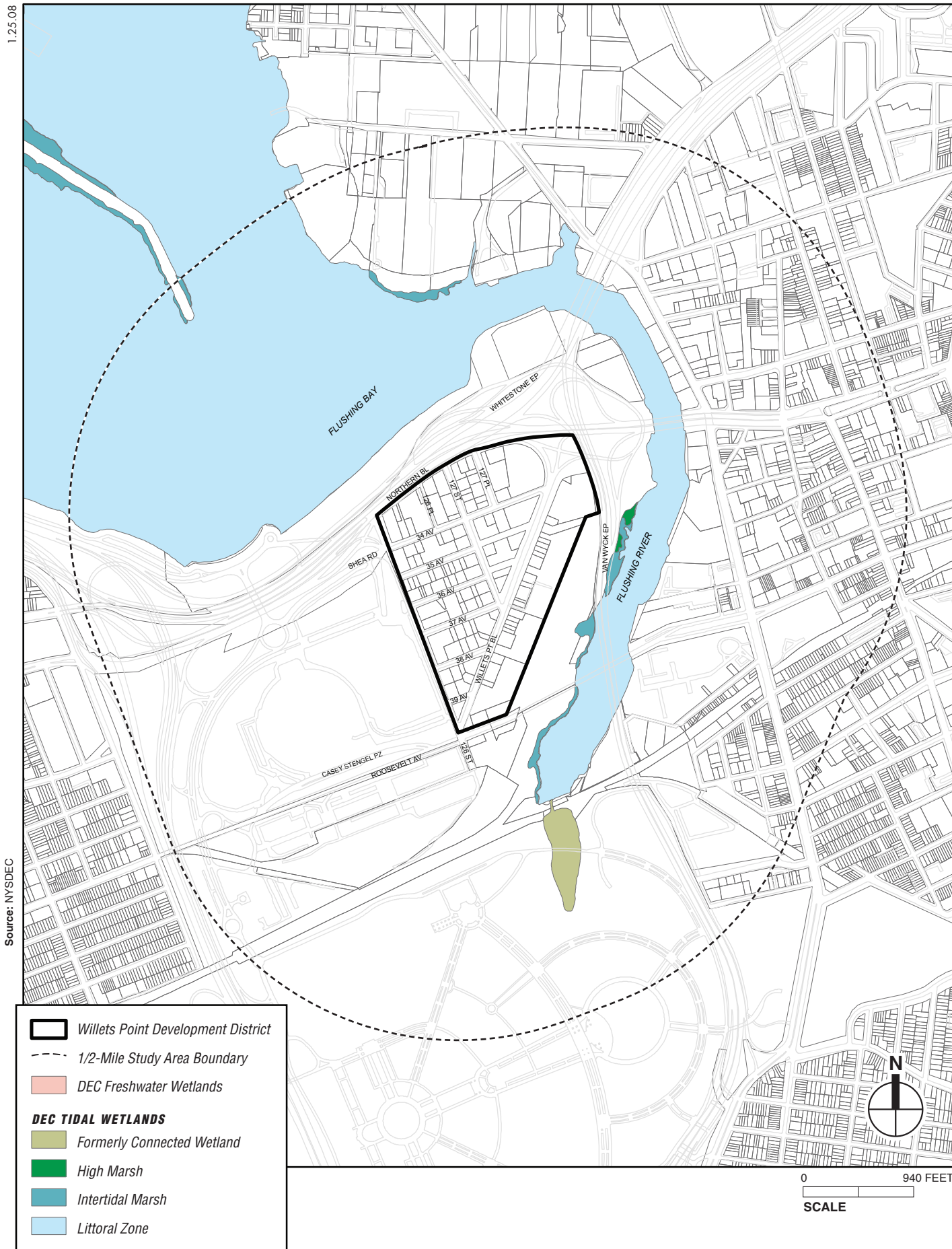
AQUATIC RESOURCES

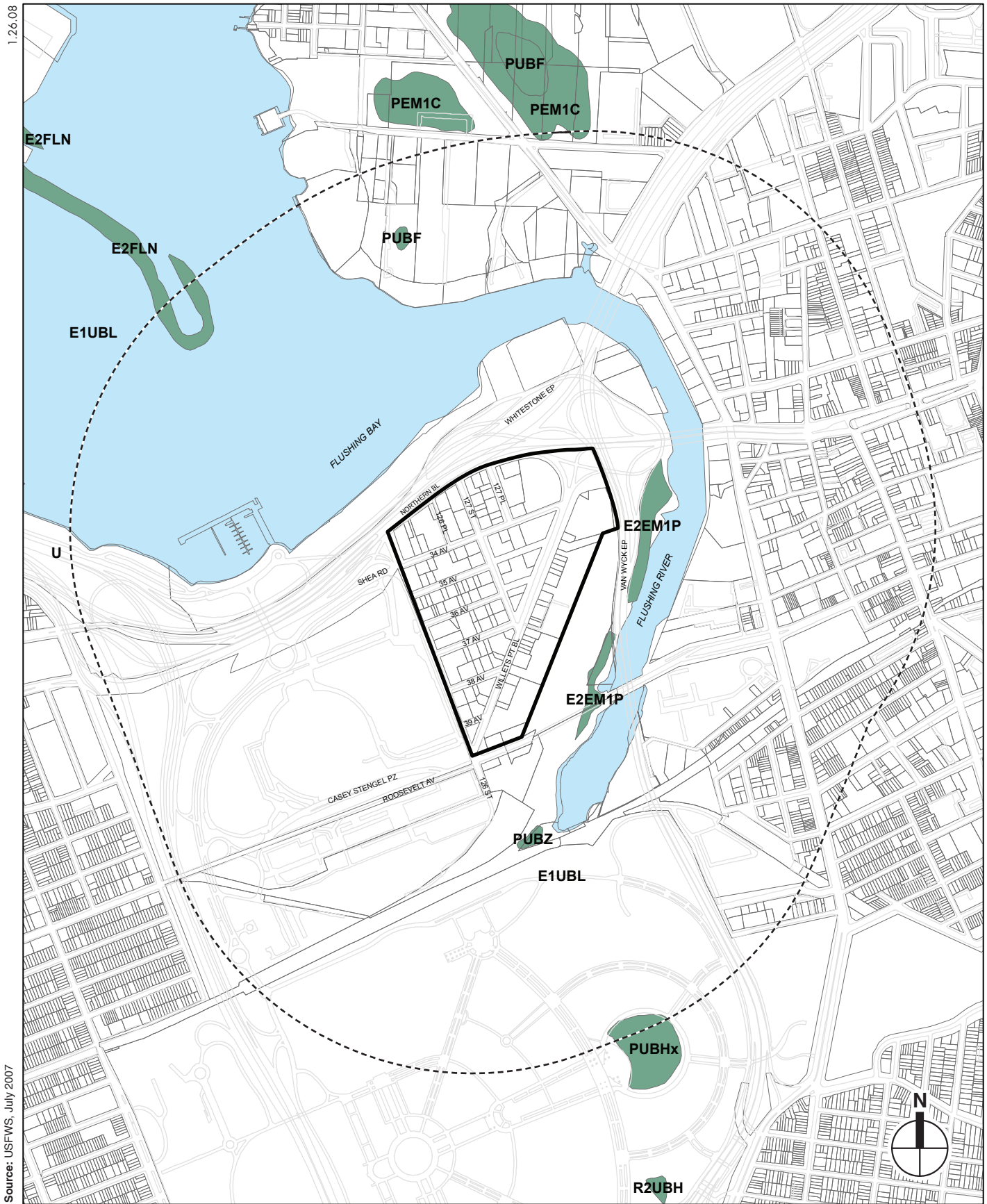
The District is located along the western shore of Flushing Bay and the Flushing River. Flushing Bay is a tidal embayment on the south shore of the upper East River. The Flushing River and the smaller Mill Creek are the primary freshwater inputs to the bay. Much of the original bay was filled for the development of LaGuardia Airport. With the exception of a 150-foot-wide artificial navigational channel maintained at a depth of 14.5 feet (4.4 m), water depths within the bay are generally shallower than the adjacent East River, ranging from a few feet near shore to over 15 feet near the bay's confluence with the East River. Flushing Bay's circulation and salinity structure near the East River are largely determined by conditions in the East River and Long Island Sound. The East River is a tidal strait that connects New York Harbor with the western end of Long Island Sound. It is approximately 16 miles long (26 kilometers [km]) and generally ranges from 600 to 4,000 feet wide (183 to 1219 meters [m]). Water depth in the federal navigation channel is maintained to 40 feet (12 meters below mean low water [MLW]) from the Battery to the former Brooklyn Navy Yard, and 35 feet (about 11 meters) at MLW from that point to the Throgs Neck Bridge. In reality, the channel is much deeper in places than the maintained depth, reaching up to 100 feet deep (about 30 meters) in areas just north of Hell Gate.

Maximum current velocities in the East River range between approximately 5 and 6 knots (8.4 to 10 feet per second); although in backwaters such as Flushing Bay the tidal currents are considerably slower. The East River and Flushing Bay shorelines are almost entirely bulkheaded or riprapped. During the early flood cycle of the East River, Hudson River water flows in via the Battery, and during the entire flood cycle, Hudson River water enters through the Harlem River. The mean tidal range is considerable, approximately 1.3 meters (4.3 feet) at the Battery, 1.5 meters (5.1 feet) at Hell Gate south of the District, and increasing to 2.2 meters (7.2 feet) at Willets Point (located east of the Throgs Neck Bridge), the entrance to the Long Island Sound. The phase of the tide at Willets Point lags the Battery by about 3 hours. This phase difference, and the difference in resulting water elevations between the Battery and Willets Point, is chiefly responsible for the rapid tidal currents in the East River (Cosper and Cerami 1996).

WATER QUALITY

Flushing Bay is a shallow, highly impacted water body that has been greatly altered by human activities over the past century. In the absence of City sewers, a minimal amount of rainwater from Willets Point is captured by on-site cisterns and an underground stormwater system. The existing stormwater runoff generated onsite is approximately 350 cubic feet per second (cfs) for a five-year storm frequency (see Chapter 14, "Infrastructure"). Stormwater runoff generated in the District and Lot B is currently discharged into Flushing Bay via two 60-inch outfalls on 126th Street and 127th Street. The maximum capacity for each outfall is 74 cfs, for a total of 148





cfs. Current runoff generated on site is greater than the total combined discharge capacity of the two outfalls; the current stormwater conveyance system is insufficiently sized to accommodate the runoff being generated, and therefore, cannot function effectively. Given its proximity to Flushing Bay, Willets Point is in a critical location to impact the bay with an influx of pollutants and toxins.

Title 6 of the NYCRR Part 703 includes surface water standards for each Use Class of New York surface waters. The Flushing Bay and River area is Use Classification I. The best usages for Class I waters are as secondary contact recreation and fishing. Water quality should be suitable for fish propagation and survival. Water quality standards for fecal and total coliform, dissolved oxygen (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/100mL from 5 or more samples.
- Total coliform—The monthly geometric mean from a minimum of 5 examinations shall not exceed 10,000 colonies/100 milliliters (mL).
- DO—Never less than 4 milligrams per liter (mg/L).
- 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 for over 90 years through the Harbor Survey. The New York City Department of Environmental Protection (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 2004). The District is in the Upper East River-Western Long Island Sound, which includes the Flushing Bay and River area.

The results of recent Harbor Surveys (DEP 2004) show that the water quality of New York Harbor has improved significantly since the 1970s as a result of measures undertaken by the City. These improvements were primarily due to regional decreases in municipal and industrial discharges that occurred through the construction and upgrading of WPCPs (DEP 1998 and 2003). While water quality continued to improve until the early 1990s, since that time improvements have been relatively small (DEP 2004).

The presence of 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 1999 through 2004 New York Harbor Water Quality Regional Summaries (DEP 2004), the waters of the upper East River, which includes Flushing Bay, meet the fecal coliform standard for Use Class I waters. 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 2001). In 2004, mean fecal coliform concentrations in the upper East River were below 100 colonies/100mL (DEP 2004).

DO in the water column is necessary for respiration by all aerobic forms of life, including fish and such invertebrates as crabs, clams, and worms. The bacterial breakdown of high organic loads from various sources can deplete DO to low levels and 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. Mean DO concentrations in the upper East River Area have increased over the past 30 years from an average that was below 3 mg/L in 1970 to above 5 mg/L in 2000 - 2003, a value fully supportive

of ecological productivity (DEP 2003). In 2004, average summer DO concentrations for the upper East River at all Harbor Survey Stations, with the exception of the Flushing Bay Survey Station (E6), were above the 4 mg/L standard for Use Class I waters (DEP 2004). All pH levels in the New York Harbor Area are in attainment. At Harbor Survey Station E6 in Flushing Bay, surface dissolved oxygen concentrations in 2004 ranged from 2.57 mg/L in August to over 14 mg/L in March.

High levels of nutrients can lead to excessive plant growth (a sign of eutrophication) and depletion of dissolved oxygen. 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 often considered suggestive of eutrophic conditions. DEP is implementing a program to reduce nitrogen loadings from wastewater treatment plants to the East River. Upgrades implemented at four upper East River treatment plants have decreased nitrogen discharges from these plants by over 30,000 pounds per day since 1993. In 2004, the average concentration of chlorophyll-*a* in the upper East River region was well below 10 µg/L (DEP 2004).

Secchi transparency is a measure of the clarity of surface waters. In many temperate estuaries, transparency greater than 5 feet (1.5 meters) can be indicative of 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) are generally indicative of poor water quality conditions. Average Secchi readings in the upper East River area have remained relatively consistent since measurement of this parameter began in 1986, ranging between about 3.5 and 6 feet (1 to 1.7 meters). Average Secchi transparency near the project area in 2004 was approximately 5 feet ([1.5 meters] DEP 2004).

New York City is served primarily by a combined sewer system, which drains some 200,000 acres and serves a population of about eight million New Yorkers. Approximately 460 outfalls throughout the City are permitted to discharge during wet-weather through combined sewer overflows (CSOs) to the receiving waters of the New York Harbor, resulting in localized water-quality problems such as periodic high levels of coliform bacteria, floatables, depressed dissolved oxygen, and, in some cases, sediment mounds and unpleasant odors. As a result of the deteriorating water quality, DEP entered into an Administrative Consent Order with DEC in 1992 to govern DEP's obligations for its CSO program. It required DEP to implement CSO abatement projects in nine facility planning areas for those areas where dissolved oxygen and coliform standards were being exceeded (including Flushing Bay) and those areas for which floatables control was necessary. The 1992 Order was modified in 1996 to add catchbasin cleaning, construction, and repair programs.

In 2004, DEP and DEC negotiated a new Consent Order that supersedes the 1992 Order and its 1996 Modifications with the intent to bring all DEP CSO-related matters into compliance with the provisions of the federal CWA and ECL, and to adopt a more comprehensive watershed-based planning approach. The new Order contains requirements to evaluate and implement CSO abatement strategies on an enforceable timetable for 18 waterbodies and, ultimately, for City-wide CSO long-term control plan (LTCP) in accordance with U.S. Environmental Protection Agency (EPA) CSO Control Policy. DEP and DEC also entered into a separate Memorandum of Understanding (MOU) to facilitate water quality standards reviews in accordance with the CSO Control Policy.

Within Flushing Bay, dissolved oxygen and coliform levels have been in non-compliance with water quality standards through the bay and the river, due primarily to urban runoff. Although

dissolved oxygen and coliform conditions in the bay and river have improved, levels continue to be significantly below standards. Flushing Bay and River were delisted in 2006 from the State's List of Impaired/Total Maximum Daily Load Waters. As part of the City's long-term CSO planning effort, a Comprehensive Watershed Plan was developed for Flushing Bay in June 2007. The purpose of this plan is to take the first step toward development of an LTCP for this waterbody. This plan assesses the ability of the existing CSO Facility Plan for Flushing Bay and Flushing River to provide compliance with the existing water quality standards. Where these facilities will not result in full attainment of the existing standards, additional alternatives are evaluated.

DEC is also leading a collaborative effort to reduce levels of toxic chemicals in New York Harbor. This work is being performed under the Contamination Assessment and Reduction Project (CARP). DEC developed a comprehensive, multi-media contaminant identification and trackdown program simultaneously with New Jersey and the CARP Work Group (a group of government, academic, and consultant experts). The states together with the work group are undertaking a variety of projects including studies of the water in the Harbor and tracking down contaminant sources in the surface water, groundwater, and wastewater of the Harbor. The overall goal of the initiative is to reduce the flow of contaminants to the Port of New York and New Jersey (PANYNJ). The principal chemicals of concern include dioxins/furans, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), metals (mercury, cadmium, and lead), and pesticides (dieldrin and chlordane [Adams et al 1998]).

SEDIMENT QUALITY

Upper New York Bay has a complex distribution of sediments in the area because of variable currents and a high degree of sediment input due to natural and human actions. USACOE ([USACE] 1999) reports that sediments in Upper New York Bay vary from coarse sands and gravels in high-energy areas to fine-grained silts and clays in low-energy areas. The upper East River primarily has a hard, rock bottom consisting of gravel, cobble, rocks, and boulders covered with a shallow layer of sediment. The shallow sediment cover is caused by strong tidal currents in the river. Backwaters such as Flushing Bay tend to be sediment traps; fine silts tend to accumulate in areas where tidal current velocities are reduced.

Typical of any urban watershed, New York Harbor Estuary sediments, including the upper East River, are contaminated due to a history of industrial uses in the area. Contaminants found throughout the New York Harbor Estuary included pesticides such as chlordane and DDT, metals such as mercury and copper, and various polycyclic aromatic hydrocarbons. Adams et al. (1998) found the mean sediment contaminant concentration for 50 of 59 chemicals measured to be statistically higher in the Harbor Estuary than other coastal areas on the East Coast. Within the New York Harbor Estuary, Adams et al. (1998) ranked Newark Bay as the most degraded area on the basis of sediment chemistry, toxicity, and benthic community, followed by the Upper Harbor, Jamaica Bay, Lower Harbor, Western Long Island Sound and the New York Bight Apex. 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. 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).

In June and October 1995, a benthic habitat mapping study was conducted in various New York area waters, including Flushing Bay (Iocco et al 2000). The study used benthic imagery to assess benthic habitat quality with respect to the presence of fauna and also assessed sediment characteristics such as grain size, subsurface features, and redox potential discontinuity (the depth to which sediments are oxidized). For most of Flushing Bay, the benthic habitat was classified as soft silt (June 1995) or as silt with infauna (October 1995). Some sampled locations indicated the presence of “stressed silt”, or silt with methane gas voids. In the June 1995 sampling, deeper collections near the confluence with the East River were characterized as azoic (silty bottoms without epifauna, infauna, or bacterial mats). The sediments in Flushing Bay were indicative of recently accumulated material that has limited potential to support a diverse benthic faunal community.

AQUATIC BIOTA

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 that support a variety of marine life. The following paragraphs describe fish and benthic life within the vicinity of the District.

A field program was undertaken in 2003 as part of the proposed North Shore marine transfer station by the New York City Department of Sanitation (DSNY) in College Point on the eastern shore of Flushing Bay. The field program was designed to characterize the marine biological resources in the area and included monthly sampling for finfish egg and larvae, and quarterly sampling for adult finfish, as well as benthic invertebrates. The DSNY program sampled a total of 126 adult finfish representing eight species. The most abundant species were Atlantic silverside (*Menidia menidia*) and Atlantic herring (*Clupea harengus*). Two adult species with essential fish habitat (EFH) listing were collected as well: Atlantic herring and winter flounder (*Pleuronectes americanus*). The most abundant finfish eggs collected were cunner (*Tautoglabrus adspersus*) and Atlantic menhaden (*Brevoortia tyrannus*). The most abundant finfish larvae were herring spp (*Clupea spp.*), Atlantic menhaden, anchovy spp. (*Anchoa spp.*), winter flounder, and goby spp. (*Gobiosoma spp.*). (DSNY, 2005). The most abundant macroinvertebrate species collected were sevenspine bay shrimp (*Crangon septemspinosa*) and grass shrimp (*Palaemonetes vulgaris*).

As part of the states of New York and New Jersey’s long-term dredged material management plan for the New York/New Jersey Harbor, mapping of the harbor’s benthic habitats was undertaken to examine the benthic environment, and to ascertain the overall condition of its communities and sediments. This 1995 study examined Jamaica, Upper, Newark, Bowery, and Flushing bays (Iocco *et al*, 2000). The study found that the benthic habitats in Newark, Bowery, and Flushing Bays consisted predominantly of silty-bottom communities; however one station near the shore in the lower basin was found to be comprised of rock and shell hash. Subsurface methane pockets were observed which indicated organic contamination in areas of Bowery and Flushing Bays and some of the peripheral basins of Jamaica Bay. Notable temporal shifts, seen in all the bays from June to October, included increases in infaunal polychaete (marine worm) density, general deepening of depths at which sediments are oxidized, and changes in species dominance within communities. Communities in each bay were found to be dominated by

opportunistic or pollution-tolerant species, and few noticeable differences in overall habitat quality were observed.

Within Flushing Bay, benthic habitats were sampled in June and October 1995 in three major areas: 1) the northwestern region, west of the main channel, 2) the northeastern region, east of the main channel, and 3) the lower basin (near Willets Point) (Iocco et al, 2000). Soft sediment habitats were predominantly observed. Oyster beds occupied the northwestern corner of the sampling area west of the channel, consisting of silty habitats with faunal communities. The presence of epifauna and infauna increased in this region of Flushing Bay in October. Stations on the eastern side of the channel mainly were composed of soft sediments and few gas voids (areas of high organic content) in June, and these habitats shifted to shallow sediment communities with infaunal worms and some gas voids in October. Gas voids, or areas of high organic content, were observed at seven and 21 percent of stations in June and October, respectively, and were most concentrated in the lower basin, near Willets Point. In June, the lower basin contained soft sediments and bacteria habitats. These habitats predominantly shifted to gas void habitats. June grab data taken at one station on the eastern side of the main channel, showed highest abundances of *Oligochaeta* (>1,500 individuals/m²) and *M. lateralis* (>1,250 individuals/m²). Grab data from October, taken from nine stations distributed in each region, showed highest average abundances of *Streblospio. benedicti* (>1,700 individuals/m²), *Leitoscoloplos robustus* (>590 22 individuals/m²), *Mulinex lateralis* (>400 individuals/m²) and *Asabellides oculata* (>360 individuals/m²). This grab data indicated the highest abundances of the bays of pollution-tolerant species, suggesting that the habitat quality is poor in this bay (Iocco et al, 2000).

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES

There are no Significant Coastal Fish and Wildlife Habitats as defined by NYSDOS. Requests for information on rare, threatened, or endangered species within the ½-mile study area around the District were submitted to USFWS, NYNHP, and NMFS. NYNHP, a joint venture of DEC and The Nature Conservancy (TNC) since 1985, maintains an ongoing, systematic, scientific inventory on rare plants and animals native to New York State. DEC 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 this state program, the USFWS maintains information for federally-listed threatened or endangered freshwater and terrestrial plants and animals. Responses from these agencies indicated that there are no threatened or endangered species in the project area.

The project area on the East River is within a portion of the Hudson River Estuary EFH that is situated in the National Oceanic and Atmospheric Administration (NOAA)/NMFS 10' x 10' square with coordinates (North) 40°50.0' N, (East) 73°50.0' W, (South) 40°40.0' N, (West) 74°00.0' W. This area includes Atlantic Ocean waters within the Hudson River estuary affecting the following: Manhattan Island, New York City, College Point, Long Island City, Brooklyn, Port Morris (NY), Unionport (NY), Flushing Bay, Astoria, LaGuardia Airport, Badland Island, Rikers Island, Roosevelt Island, Wards Island, and Hell Gate, along with the East River, the Harlem River, and the Bronx River. The area of Flushing Bay containing the District has been identified as EFH for 18 species of fish. Table 11-2 lists the species and life stages of fish identified as having EFH.

Table 11-2

Essential Fish Habitat Designated Species for the Upper New York Bay

Species	Eggs	Larvae	Juveniles	Adults
Pollack (<i>Pollachius virens</i>)			X	X
Red hake (<i>Urophycis chuss</i>)		X	X	X
Winter flounder (<i>Pseudopleuronectes americanus</i>)	X	X	X	X
Windowpane (<i>Scopthalmus aquosus</i>)	X	X	X	X
Atlantic herring (<i>Clupea harengus</i>)		X	X	X
Bluefish (<i>Pomatomus saltatrix</i>)			X	X
Atlantic butterfly (<i>Peprilus triacanthus</i>)		X	X	X
Atlantic mackerel (<i>Scomber scombrus</i>)			X	X
Summer flounder (<i>Paralichthys dentatus</i>)		X	X	X
Scup (<i>Stenotomus chrysops</i>)	X	X	X	
Black sea bass (<i>Centropristus striata</i>)			X	X
King mackerel (<i>Scomberomorus cavalla</i>)	X	X	X	X
Spanish mackerel (<i>Scomberomorus maculatus</i>)	X	X	X	X
Cobia (<i>Rachycentron canadum</i>)	X	X	X	X
Sand tiger shark (<i>Odontaspis taurus</i>)		X		
Sandbar shark (<i>Charcharinus plumbeus</i>)		X		X
Clearnose skate (<i>Raja eglanteria</i>)			X	X
Little skate (<i>Leucoraja erinacea</i>)			X	X
Winter skate (<i>Leucoraja ocellata</i>)			X	X
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40407350.html				

D. THE FUTURE WITHOUT THE PROPOSED PLAN

TERRESTRIAL RESOURCES

In the future without the proposed Plan, conditions in the District are anticipated to remain the same as those described under existing conditions. Proposed development in adjacent areas, including development of Citi Field will occur in an existing urban environment. That project does not include any new open space, and thus would not change the existing amount of vegetation, or natural habitat for terrestrial wildlife within the immediate area surrounding the District. Within the broader ½-mile study area, none of the projects expected to be completed by 2017 include an open space element.

FLOODPLAINS AND WETLANDS

Nearly all lands within the ½-mile study area of the District are within the 100-year floodplain. Development adjacent to the District, excluding the Flushing Meadows-Corona Park, predominantly contains impervious surface area. Because the construction of Citi Field is taking place in an existing developed area, the development is not expected to exacerbate flooding conditions in the floodplain, or increase flooding in surrounding areas. In addition, no losses to floodplain and wetlands would be expected. Other development expected to take place in the ½-mile study area in the future without the proposed Plan would occur east of the Flushing River in developed areas.

AQUATIC RESOURCES

In the future without the proposed Plan, the District is expected to remain the same and existing industrial activities would continue. Two projects have the potential to affect aquatic resources: the adjacent Citi Field development and the proposed DSNY North Shore marine transfer station. The Citi Field development would not be expected to result in significant adverse impacts on water quality or aquatic resources, since it is located more than 1,000 feet away from the shoreline of Flushing Bay. DSNY's North Shore marine transfer station (MTS) is an existing development located on the eastern shore of Flushing Bay, approximately 2,500 feet away from the District. The MTS is one of several MTSs proposed for expansion and use under DSNY's long-term waste export plan. The facility will be upgraded to transport waste by barge, and includes a dredging program. The project is planned to be in operation in 2011 (DSNY, 2005). Separate environmental reviews and permitting have been conducted for each of the projects, and those reviews concluded that the projects would not result in significant adverse impacts on water quality or aquatic resources.

There are several proposed and ongoing projects aimed at improving water quality and aquatic resources in New York that have the potential to result in water quality and aquatic habitat improvements in Flushing Bay and the Flushing River. These projects are independent of the proposed Plan. Improvements that would result from these projects, described below, would occur without the proposed Plan and are expected to continue through the proposed construction in 2009 to full operation of the project in 2017.

New York/New Jersey HEP Projects

Several of the future water quality improvement efforts in the Lower Hudson River Estuary will be coordinated by the New York/New Jersey Harbor Estuary Program (HEP). The Final Comprehensive Conservation and Management Plan ([CCMP] NY/NJ HEP 1996) for the HEP included a number of goals to improve water quality and aquatic resources in the area. The CCMP outlines objectives for the management of toxic contamination, dredged material, pathogenic contamination, floatable debris, nutrients and organic enrichment, and rainfall-induced discharges. The HEP Habitat Workgroup has developed watershed-based priorities for identifying acquisition, protection, and restoration sites for 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. No NY/NJ HEP Acquisition and Restoration Sites have been identified within the project area.

The CARP, sponsored by PANYNJ, is a component of HEP focused on understanding the fate and transport of contaminants discharged to the estuary, and using this information to develop measures that may be necessary to reduce sediment contamination. The principal chemicals of concern include dioxins/furans, PCBs, PAHs, metals (mercury, cadmium, and lead), and pesticides (dieldrin and chlordane). Continued research and monitoring programs are anticipated to play a role in the development of future management strategies for Harbor sediments (NY/NJ HEP undated, USACE 1999).

DEP Projects

EPA's National CSO Strategy of 1989 requires states to eliminate dry weather overflows of sewers, meet Federal and State water quality standards for wastewater discharges, and minimize impacts on water quality, plant and animal life, and human health. CSOs are the largest single source of pollutants and pathogens to the New York Harbor. DEP has taken several steps in recent

years to mitigate discharges from CSOs, which, in combination with improvements that have been made to WPCPs, and the on-going Comprehensive City-Wide Floatables Abatement Plan, are expected to result in future improvement in coliform, dissolved oxygen, and floatables levels in the New York Harbor area. The Multi-Year Intended Use Plan of the New York City Municipal Water Financing Authority has identified several CSO improvement and abatement projects, which will be completed by 2010. 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 will integrate CSO Facility Planning Projects and the Comprehensive City-Wide Floatables Abatement Plan, incorporate ongoing Use and Standards Attainment Program (USA) Project work, and will develop Waterbody/Watershed Facility Plan Reports and the LTCP for each waterbody area, including Flushing Bay. The LTCP Project monitors and assures compliance with applicable Administrative Consent Orders between DEC and New York City for the CSO Abatement Program. To date, several initiatives have been undertaken as part of the 2004 Order to improve the quality of Flushing Bay including approval of the Flushing Bay Watershed Plan (previously described in Section C), as well as several infrastructure improvements. DEP also plans to increase identification and control of pollutants of concern, including mercury, PCBs, and solvents.

Other Projects

Other proposed projects located outside the District, but within the drainage area serviced by the Bowery Bay Water Pollution Control Plant (WPCP), have the potential to affect aquatic resources of Flushing Bay in the vicinity of the District without the proposed Plan. Such projects would include those that would result in development of new uses and uses with greater densities. These projects have the potential to result in greater water volume needs and sewage discharges to the combined sewer system than current uses, and have the potential to result in increased sewage discharge to Flushing Bay from CSOs, which may affect water quality in the Bay and River.

The Bowery Bay Water Pollution Control Plant (WPCP) is a conventional secondary wastewater treatment plant that has been in service since 1939. Its receiving waterbody is the upper East River. The existing plant has treatment facilities designed and permitted to treat an annual average dry weather flow of 150 million gallons per day (mgd), which would produce approximately 40 dry tons per day (dtd) of dewatered sludge. The plant has hydraulic capacity to convey and to provide primary treatment for 300-mgd of wet weather flow. The dewatered sludge is hauled off-site and further processed in accordance with DEP's Sludge Management Program. The average daily flow rate at the plant for the period between January 2006 and December 2006 was 109 mgd. DEP's 2006 projected dry weather wastewater flows to the Bowery Bay WPCP in 2015 and 2020 are 119 and 122 mgd respectively (DEP 2006). With the additional treatment of waste from projects proposed outside of the District, including the proposed Citi Field, the WPCP would still be within its permitted capacity. Thus, no adverse environmental impacts on the water quality of Flushing Bay or River, or the upper East River are expected. Chapter 14 provides additional detail on this WPCP.

E. PROBABLE IMPACTS OF THE PROPOSED PLAN

PROPOSED PLAN

As described in Chapter 1, "Project Description," the Willets Point Development Plan has been accepted as a pilot LEED-ND project by the United States Green Building Council (USGBC). Based on preliminary designs, it is likely that development under the Plan could achieve LEED-

ND Gold certification. As part of this effort, the lead agency and New York City Economic Development Corporation (NYCEDC) are exploring the potential for the integration of several sustainable site planning features that would benefit natural resources in and within the vicinity of the District. These include green roofs, on-site storage and treatment facilities, graywater recycling, and bioswales to address stormwater management. The following sections discuss the potential for natural resource impacts to occur as a result of the proposed Plan.

TERRESTRIAL RESOURCES

Construction of the proposed Plan would result in the loss of small areas of successional plant communities currently found in the District. Lot B is currently being used as a construction staging area for Citi Field and does not contain plants of significance. The proposed Plan entails construction of a minimum of eight acres of open space—a substantial increase over the amount of existing natural area in the District and on Lot B. Although construction of the proposed Plan has the potential to displace existing birds and wildlife to nearby areas such as the Flushing Meadow-Corona Park, the proposed open space would provide a minimum of eight acres of new habitat to wildlife species tolerant of urban conditions, including the birds and wildlife that currently inhabit the site. The wildlife species expected to occur in the District are common to urban areas, and the potential loss of some individuals would not result in a significant adverse impact to the bird and wildlife community of the New York City region.

During operation of the proposed Plan, landscaping added to the park areas would enhance the wildlife habitat currently found within the District. This enhanced habitat also would have the potential to provide improved resting or stop-over habitat for migratory songbirds during the spring and autumn migrations. Additionally and as described above, other open space areas that may be developed within the District as part of the LEED-ND efforts, such as green roofs and bioswales, would provide additional habitat for wildlife. No significant adverse impacts on terrestrial or wildlife resources are anticipated as a result of construction and operation activities.

FLOODPLAINS AND WETLANDS

As shown in Figure 11-1, the 100-year floodplain covers a majority of the District, all of Lot B, and nearly the entire ½-mile study area surrounding the District. The 500-year floodplain covers the northern quarter of the District. Development of the proposed residential, retail, office space, hotel, convention center, and open space would occur on the 100- and 500-year floodplain. The District and Lot B are currently developed, with no open space areas. Because the project would introduce a minimum of eight acres of open space, the amount of developed surface would be reduced.

The proposed Plan would comply with the New York City Building Code (Title 27, Subchapter 4, Article 10) and Federal Emergency Management Agency (FEMA) requirements regarding the lowest floor elevation, which would be at or above the base flood elevation (BFE)¹. It is anticipated that approximately zero to six feet of fill would be used to raise the site to 14 feet (NAVD 1929) to be above FEMA 100-year flood level and graded to ensure that the lowest floors of the residential towers are above the BFE. The proposed Plan would include a new separate stormwater system that would be connected to the existing outfalls. Implementation of this new system, in addition to onsite stormwater detention, would provide for adequate

¹ 10 feet above the borough datum

stormwater management. Construction of the proposed Plan within the floodplain would not adversely affect the floodplain's ability to contain flood waters and would not exacerbate flooding conditions within the site or its immediate vicinity. The proposed stormwater management system would eliminate street flooding and uncontrolled runoff, and would reduce the current intense surface flows to nearby wetlands. The floodplain within and adjacent to the District is affected by tidal flooding originating from either Long Island Sound or New York Harbor (FEMA 2001), and therefore, the site does not act as a recharge area and would not be affected by construction of the proposed Plan.

The District and Lot B are more than 180 feet away from a DEC-mapped tidal wetland and more than 165 feet away from a USFWS NWI-mapped wetland. Therefore, adverse impacts on DEC or USFWS mapped wetlands are not expected.

AQUATIC RESOURCES

The proposed Plan includes approximately 8.94 million gsf of new development, including a minimum of eight acres of open space. Construction of the new buildings would result in the removal or capping of contaminated soils and historic fill. As discussed in Chapter 12, "Hazardous Materials," implementation of the measures during construction activities would minimize the potential for significant adverse impacts to groundwater quality. Adverse impacts on groundwater flow patterns are not expected.

Construction activities within the District and on Lot B have the potential to temporarily affect the water quality of Flushing Bay and the Flushing River where stormwater is discharged. Stormwater generated during construction as well as operation would be discharged to Flushing Bay via connection to the two existing 60-inch outfalls at 126th and 127th Streets. No additional outfalls would be constructed. The proposed Plan would comply with the New York Guidelines for Urban Erosion and Sediment Control and the New York State Management Design Manual. Best management measures implemented during construction would include erosion and sediment control measures as part of a stormwater pollution prevention plan (SWPPP) and would minimize potential impacts on Flushing Bay associated with stormwater runoff. The SWPPP would comply with the Flushing Bay Comprehensive Watershed Plan (described above in Section C, "Existing Conditions") and would take into account that Flushing Bay is an existing impaired waterbody. Therefore, significant adverse impacts on surface water quality would not be expected during construction of the proposed Plan.

As detailed in Chapter 14, the flow of stormwater runoff generated by the District and Lot B development during operation would largely remain unchanged at 350 cfs. Because the overall stormwater runoff volumes would exceed the capacity of the two existing outfalls (148 cfs), and because the current conveyance system is also undersized, stormwater management features would be implemented to control stormwater flow in order to remain within the capacity of the two outfalls; modifications to the existing outfalls would not be required. Possible stormwater management features could include an extensive network of storm sewers and detention basins. Prior to redevelopment of the site and in coordination with DEP, an amended drainage plan would be prepared to comprehensively address all the surface runoff and separate handling of the sanitary dry flow that would be generated as a result of the proposed Plan, and drainage features to be included in the development of the District.

Sustainability design guidelines for the proposed Plan are currently under development by NYCEDC, but may include rooftop storage and filters, underground storage, inline pipe storage, decorative wet ponds, detention dry ponds, proprietary pre-treatment structures, bio-swales,

green roofs, gray water irrigation, wetland restoration, urban agriculture, and porous pavement. These measures would further improve the overall stormwater management, energy, and water quality during project construction and operation.

The Willets Point area is currently without connections to the New York City sanitary sewer system, relying solely on septic tanks for sanitary waste collection. As described in Chapter 14, the proposed Plan would include the development of new sanitary sewer infrastructure that would connect to the City's sewer system, and ultimately to the Bowery Bay WPCP. The Plan would result in a discharge of 2.8 mgd to the Bowery Bay WPCP, and would not cause it to exceed its capacity or SPDES permit limit of 150 mgd. Modeling simulations (see Chapter 14) determined that the additional sanitary flow from the proposed Plan (2.8 mgd) would not affect the number of annual CSO events; the total annual volume of CSO discharge would increase by less than one percent (0.76 percent). The largest increase in CSO discharge would occur at Outfall BB-008, located just north of the project area on Flushing Bay (see Figure 14-2).

The proposed Plan would be consistent with the City's goal to reduce CSO events by requiring construction and maintenance of a separate storm and sanitary sewer system. Given that the District currently lacks sanitary sewer infrastructure, and stormwater from the existing industrial uses flows uncontrolled into Flushing Bay, conditions in the future with the proposed Plan would be an improvement over current conditions. Overall, implementation of the new system is expected to result in improved water quality in Flushing Bay by eliminating site flooding, improving the quality of the soil substrate of the site, and providing direct drainage to storm sewers; incorporating sustainable design features, where feasible, to reduce the discharge volume and increase the quality of storm water discharges; and preventing stormwater generated within the District from entering the combined sewer system, which would increase the frequency and volume of CSO discharges. All discharges would be required to meet applicable water quality standards of receiving waters. The projected discharges would not be expected to result in an adverse impact on Flushing Bay, and it would continue to meet Class I standards. The life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates found within Flushing Bay are fairly tolerant of varying environmental conditions and have developed behavioral and physiological mechanisms for dealing with these variations. Therefore, temporary, localized changes in water quality that may occur as a result of the CSO discharge would not be expected to result in significant adverse impacts to aquatic biota. Significant adverse impacts on surface water quality would not be expected during operation of the proposed Plan.

NO CONVENTION CENTER SCENARIO

The effect of the No Convention Center Scenario on terrestrial, floodplain and wetland, and aquatic resources would be similar to those described above under Proposed Plan. The No Convention Center Scenario would not result in significant adverse impacts on natural resources.

F. REFERENCES

"2002 Harbor Water Quality Survey Summary." (DEP). New York, NY. 2003.

Adams, D.A., J.S. O'Connor, and S.B. Weisberg. "Final Report: Sediment Quality of the NY/NJ Harbor System." An Investigation under the Regional Environmental Monitoring and Assessment Program (R-EMAP). EPA/902-R-98-001. 1998.

Willets Point Development Plan

- “Brooklyn – Queens Aquifer System”. *U.S. Environmental Protection Agency*. 2007. Accessed June 18, 2007. Available: <http://www.epa.gov/region02/water/aquifer/brooklyn/brooklyn.htm#I6>.
- Cosper, E.M., and J.C. Cerami. “Assessment of Historical Phytoplankton Characteristics and Bloom Phenomena in the New York Harbor Estuarine and New York Bight Ecosystems.” Final Report to the Hudson River Foundation. 1996.
- “DEP Interim Water Demand and Wastewater Flow Projections.” (DEP). 2006.
- “Factsheet No. 3: Pollution in the Harbor Estuary.” NY/NJ Harbor Estuary Program (NY/NJ HEP).
- “Final Draft Phase II Environmental Site Assessment, Willets Point, Queens, New York.” HDR and LMS. 2005.
- “Final Environmental Impact Statement (FEIS) for the New York City Comprehensive Solid Waste Management Plan.” DSNY. 2005.
- “Flood Insurance Study, City of New York, New York, Bronx County, Queens County, New York County, Kings County, Richmond County.” FEMA. Community Number 360497. 2001.
- “Harbor Water Quality Survey Data for 1995 through 2003.” DEP. New York, NY. 2004.
- Iocco, L.E., P. Wilbur, R. J. Diaz, D. G. Clarke, R. J. Will. “Benthic Habitats of New York/New Jersey Harbor: 1995 Survey of Jamaica, Upper, Newark, Bowery, and Flushing Bays.” 2000.
- “Monthly Sewage Flows.” DEP. New York, NY. April 26, 2007.
- “New York and New Jersey Harbor Navigation Study.” USACE - New York District. Draft Environmental Impact Statement (DEIS). 1999.
- NYCDEP (DEP). 1998. No title.
- “New York-New Jersey Harbor Estuary Program, Including the Bight Restoration Plan: Final Comprehensive Conservation and Management Plan.” NY/NJ Harbor Estuary Program (NY/NJ HEP). 1996.
- “New York State Breeding Bird Atlas.” *NYSDEC*. 2006. Accessed June 6, 2007. Available: <http://www.dec.ny.gov/animals/7312.html>.
- “Priority Acquisition and Restoration Sites.” NY/NJ Harbor Estuary Program (NY/NJ HEP). 2006.
- Steinberg, N., D.J. Suszkowski, and J. Way. “Harbor Health/Human Health: An Analysis of Environmental Indicators for the NY/NJ Harbor Estuary.” Prepared for the NY/NJ Harbor Estuary Program by the Hudson River Foundation for Science and Environmental Research. Produced under a cooperative agreement between the Hudson River Foundation and US EPA Region II. New York, NY. 2002.
- Steinberg, N., D.J. Suszkowski, J. Way, and L. Clark. “Health of the Harbor. The First Comprehensive Look at the State of the NY/NJ Harbor Estuary.” A report to the NY/NJ Harbor Estuary Program. Hudson River Foundation. New York, NY. 2004. 82 pp.

✱