APPENDIX D
Environmental Assessment

ENVIRONMENTAL ASSESSMENT

BRONX RIVER GREENWAY
WESTCHESTER AVENUE TO EAST TREMONT AVENUE

Bronx, New York

NYSDOT Contract No. D015284/PIN X027.05.122

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Chapter D-1: Project Description

A. INTRODUCTION

The New York State Department of Transportation (NYSDOT) proposes to provide a pathway as a walkway and "Cass I" bikeway along the Bronx River from Westchester Avenue to East Tremont Avenue in the Bronx. The Bronx River Greenway project will provide a quality facility for people to cycle, walk, run, or skate for transportation, recreation, or exercise, enhance the Bronx River's natural qualities and public use, restore the Bronx River's natural shorelines to the extent possible in this area, and provide additional public open space amenities (e.g., bridges over the Bronx River and an open air amphitheater). The project represents a major segment of the entire Bronx River Greenway corridor that extends from the Bronx/Westchester County border to the East River.

The Proposed Project requires city, state, and federal approvals and permits for funding and construction. NYSDOT is the public agency undertaking the project and its action is subject to State Environmental Quality Review (SEQR). In addition, this review may also form the basis of the National Environmental Policy Act (NEPA) for any required federal permits or other actions that the project may require. Due to eminent domain land acquisition required to progress this project to the stated project limits, the project documentation is being progressed as a SEQR Non-Type II Environmental Assessment (EA). The project is also considered to be a NEPA Class II action (Categorical Exclusion).

The Proposed Project involves a number of components, ranging from the provision of a multi-use path to shoreline restoration, provision of canoe/boat launch areas, floating docks, multi-use path bridges, and other amenities. This EA has taken all of the various project components into consideration in the analysis of the potential environmental effects of the overall project.

B. PROJECT DESCRIPTION

PROJECT LOCATION

Nestled within a complex network of transportation infrastructure—including Westchester Avenue, the elevated Nos. 2, 5, and 6 subway lines, I-95 (Cross Bronx Expressway), I-895 (Arthur Sheridan Expressway), and AMTRAK's Northeast Corridor Line—the site is approximately 25 acres along a one-mile stretch of the Bronx River between Westchester Avenue and East Tremont Avenue (Figure D-1-1).

From East 172nd Street to East Tremont Avenue, all proposed construction will be on public right of way (ROW) under the ownership jurisdiction of NYSDOT, New York City Department of Transportation (NYCDOT), or New York City Department of Parks and Recreation (NYCDPR) depending on the location. East of AMTRAK's ROW and south of 172nd Street, two properties will be acquired by NYSDOT under New York State's Eminent Domain Procedures. These include Apex Auto on the east river bank and the PDJ Simone site (currently

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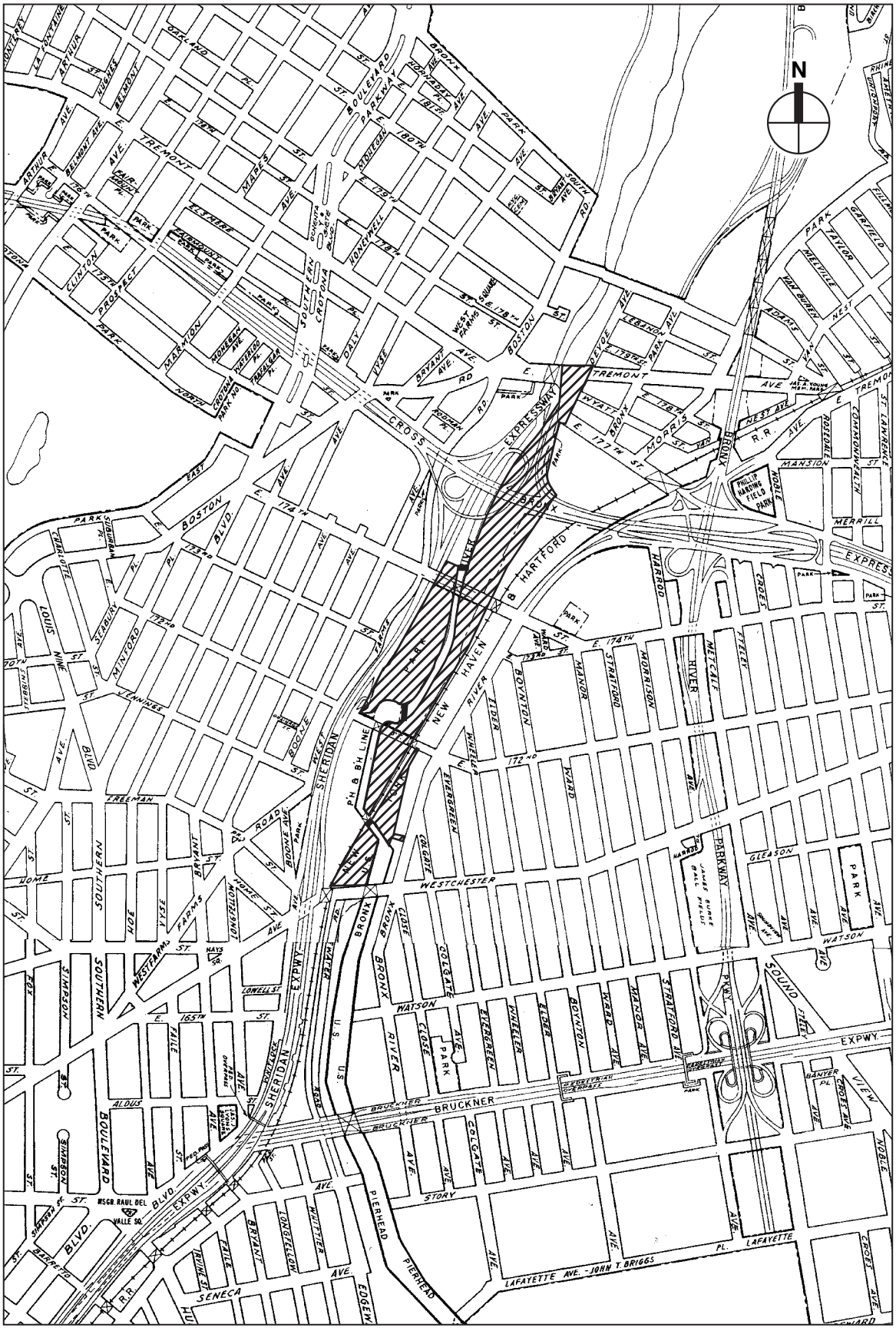

Project Location

Figure D-1-1

leased as a New York City Marshall Impound Lot) on the west river bank. Both parcels are currently paved and total 3.3 acres. Some of the properties currently in NYSDOT jurisdiction will be turned over to the City of New York, but NYCDPR has agreed to maintain the entire Bronx River Greenway corridor within the project limits regardless of property ownership.

Starlight Park, located on the west bank of the river between approximately East 172nd and East 174th Streets, is under the ownership jurisdiction of NYCDPR. Currently denuded and closed to the public, the 3.6-hectare (HA) (8.9-acre) park is undergoing contaminated materials remediation by the Consolidated Edison Company of New York due to historic uses of the property. The remediation work in Starlight Park is the responsibility of the Con Edison, and is being performed by Con Edison under the supervision of the NYSDEC. Starlight Park was designed as part of the rehabilitation of the Arthur Sheridan Expressway and was part of the permitting and environmental evaluation of that project.

BRONX RIVER GREENWAY CORRIDOR

The entirety of the Bronx River Greenway Corridor will provide valuable transportation links and options to the communities it passes through. The Proposed Project will eventually provide a vital link between the Bronx River Greenway Corridor extending from the East River to beyond the Westchester County border (Figure D-1-2). Although it would become a link in the larger network, the project provides significant utility independent of the entire Bronx River Greenway corridor, including car-free passage for cycling and walking between the Bronx River and West Farms neighborhoods and their associated transit services, schools, and shopping. The completed Bronx River Greenway would also provide improved walking and cycling access to the Bronx Zoo, the Bronx Botanical Gardens, various community parks along the Bronx River, and would eventually be part of a connection to and from Manhattan.

The Proposed Project will connect to NYCDPR's planned park at the former concrete plant site to the south and to NYCDPR's Bronx River Park (West Farms segment) of the Bronx River Greenway to the north. NYSDOT is coordinating closely with NYCDPR to ensure seamless links between these projects and additional projects linking Soundview Park and Randall's Island to the south and into Westchester County to the north. The Randall's Island connection will link the Bronx River Greenway corridor to the Manhattan Waterfront Greenway. In addition, the Bronx River Greenway corridor intersects the Pelham Parkway Greenway, including Pelham Bay Park, City Island, and Orchard Beach, and the Mosholu Parkway Greenway leading to Van Cortlandt Park and the North County Trail (continuous trail to be constructed from the New York City/Westchester County border up through part of Putnam County). The Proposed Project may also serve as a segment in the evolving East Coast Greenway from Florida to Maine.

PROPOSED PLAN

The Greenway will originate at the southern side of Westchester Avenue adjacent to the west shore of the Bronx River. At this location, a new signal and crosswalk will provide a safe crossing for trail users to the north side of Westchester Avenue.

From the north side of Westchester Avenue, the path will continue north, descending towards the Bronx River. The space through which the path travels will be bounded on the west by the Amtrak/CSX tracks and on the east by the Bronx River. Since the tracks pass underneath Westchester Avenue, and the path originates at grade on top of Westchester Avenue, it will be

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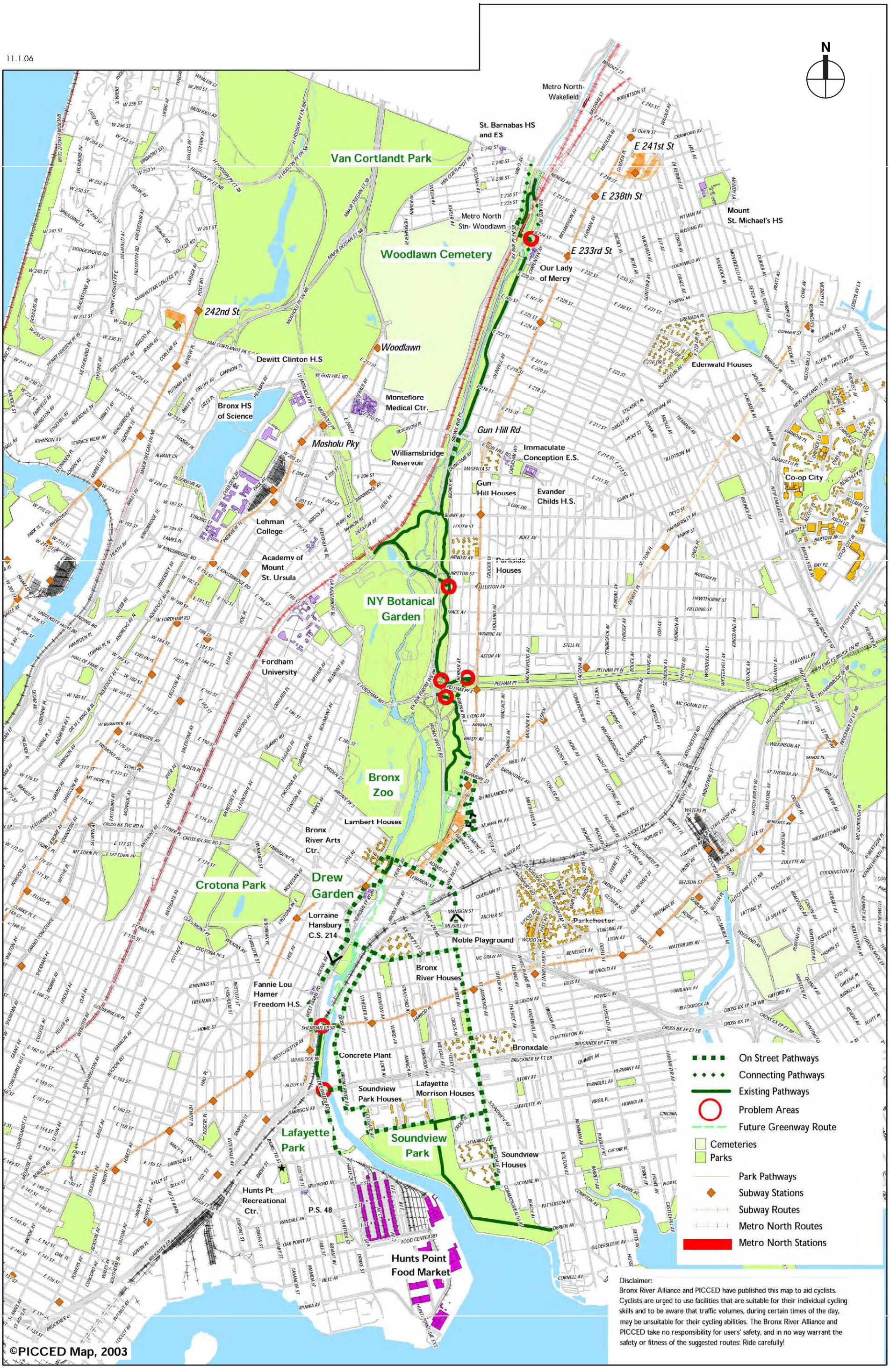

Source: Bronx River Alliance

Figure D-1-2
Bronx River Greenway Corridor

necessary to build a retaining wall along the tracks to make up the grade difference between the path elevation and the track elevation on which a fence will be constructed to secure the tracks.

From this wall, the earth will slope directly into the Bronx River, necessitating removal of the existing bulkhead and buildings will be removed from this space, and the ground will be sloped to a mid-tide elevation along the existing riverbank. Boulders and rip-rap will reinforce the bank from the river bottom to the mid-tide elevation. The slope between the path and the riverbank will be vegetated with native plants appropriate to the elevation above midtide level to provide new wildlife habitat. From midtide elevation to mean high water elevation will be a low-level marsh planted with *Spartina alternifolia*. From mean high water elevation to mean higher high water elevation will be a high level marsh planted with *Spartina patens* and other wetland plants. At higher elevations, a native meadow with scattered groupings of native trees is planned.

At the riverbank, a sitting area with shade structure will be provided on the south side of the path along the western shore of the Bronx River with a safety rail tying into the bridge railing. The path will then cross a new bridge to the east bank of the Bronx River parallel to the CSX Bridge over the Bronx River. This bridge will be a rustic steel truss to aesthetically compliment its neighboring bridges.

Just north of this bridge, neighborhood access will be provided by a side path that will connect the Greenway to Bronx River Avenue midway between Westchester Avenue and E. 172nd Street. This side path will also envelope and provide access to a new sitting area on the west bank of the Bronx River. This sitting area will provide views south under the Westchester Avenue Bridge and views across the river to the proposed native marsh and meadow. Existing bulkheads in this area will be removed, revealing natural rock outcroppings to be viewed from the sitting area or from the Greenway path on the opposite side of the river. Native plants will be planted or seeded in soil pockets in the rocks to create more wildlife habitat.

From this point, the main path will continue north, running through a space bounded on the west by the CSX tracks and on the east by the backyards of residential buildings that front on Bronx River Avenue. Security fence will be placed both along the tracks and along the back yards of adjacent property owners. East of the path will be a low area that will serve as an infiltration basin during and for up to 2 days after rain events and as an informal play lawn during dry weather.

The main path will continue north to a “T” intersection at 172nd Street, where another neighborhood access point will be provided. At this point, a side path (which will occupy a new ramp on the southern half of the existing East 172nd Street) will lead east to the intersection of East 172nd Street, Bronx River Avenue and Evergreen Avenue.

From 172nd Street, the main path will continue to the west, over a new bridge (Bridge #2) that will allow path users to cross from the east side to the west side of the Amtrak and CSX tracks. This bridge will be a similar truss style to Bridge #1, but require sufficient security measures for crossing over Amtrak’s catenary lines and tracks.

From the west side of the railroad tracks, the main Greenway path will gently and gracefully wind downhill, traveling generally south before returning north, to meet the elevation of a new bridge (“Bridge #3”) that will cross the Bronx River to reach the southern end of Starlight Park. Retaining walls will be required to allow the path to have a gradual descent to the river, while minimizing disturbance to existing vegetation and grades at the river’s edge. At the top of this slope, an overlook will be constructed with a built-in seat wall and views of the Bronx River, Bridge #3, and Starlight Park. For those walking, a winding staircase will be constructed to

provide direct access from this overlook to provide a more direct route for able-bodied pedestrians to travel from 172nd Street to Starlight Park or the direct northern-bound portion of the path.

An overlook mid-way down the slope will provide seat walls and planted trees for shade from which to enjoy the view. Near this overlook, an informal set of stairs will arc down a slope to meet a proposed nature path for walking only running south through the high-level marsh adjacent to the river. This nature path will also provide access to a dog run south of the slope along the Amtrak fence.

At the bottom of the winding, sloping portion of the path, a long, low seat wall, parallel to the edge of the path, will provide another vantage point from which to enjoy the Bronx River and adjacent restored high-level marsh. At the end of this seat wall, a wheelchair accessible entrance will be provided to the proposed pedestrian nature path that will form a loop near the entrance before branching out to follow the river bank north and south of the entrance.

Just north of the accessible nature path entrance, a side path will travel west across the Bronx River, over proposed Bridge #3, to Starlight Park. This bridge will be a rustic steel tied arch cable stay bridge, providing both sweeping views of the Bronx River and serving as a centerpiece to the project.

The main multi-use path will continue north, hugging the Amtrak property line on the east side of the Bronx River. As the width of property between Amtrak and the Bronx River narrows, the 5.2 m (17 ft) multi-use path splits into separated bikeway and walkway paths. The bikeway will be a 3.0 m (10 ft) asphalt path and walkway will be a 2.4 m (8 ft) stone dust path. These paths are relatively parallel, but the walkway will be next to the Bronx River and the bikeway closer to Amtrak. The purpose of separating the multi-use path into two separate paths was to give designers greater flexibility in retaining quality trees and give people walking a more relaxed experience along the riverbank.

Both the walkway and bikeway will travel northward through a restored native woodland and pass under the East 174th Street Viaduct. Several secondary walkways will create a mesh of alternative routes through the restored woodland. North of East 174th Street, the walkway and bikeway will rejoin into a 5.2 m multi-use path. This multi-use path will pass under a restored abandoned railroad signal bridge in a forested area near Amtrak, and follow a wide arc westward towards the river. A secondary walkway path will pass through a river viewing area adjacent to the Bronx River, and join the multi-use path near proposed Bridge #4. The multi-use path and secondary walkway form a large loop enclosing another restored woodland area and a combination play lawn / infiltration basin.

The multi-use path will diverge to provide a 5.2 m (17ft) multi-use path continuing north and a 5.2 m (17 ft) multi-use path connecting to the proposed Bridge #4 crossing the Bronx River into the north end of Starlight Park. A path within Starlight Park on the west bank of the river will connect Bridge #4 and Bridge #3 so that a continuous recreational loop will be created with the Greenway paths on the east bank of the Bronx River of close to 1 km (0.5 miles) in length. Via existing pedestrian ramps, Starlight Park paths will provide connections from the East 174th Street Viaduct to Bridge #4 and the main Greenway path.

Improvements within Starlight Park include floating docks just south of Bridge #3. The floating docks will provide a safe location for launching non-motorized watercraft and for portaging over an existing weir that is exposed during low tide. A platform will be constructed just above the high-high tide elevation on which the gantries will be hinged. The docks will maintain their

positions on the high and low sides of the weir by lateral support from the gantries and supplementary cables. This design will allow the docks to accommodate changing tidal water elevations. Docks and gantries will be removed and stored during the winter months and if there is a major storm event.

Other facilities that will be included in Starlight Park include parking, a multi-use play field (permitted as a soccer field, two baseball diamonds, or performance seating), a basketball court, swing sets, spray bollards, a play structure, and a picnic area that can be utilized as a small performance space. NYCDPR will be constructing a boathouse with comfort station near the docks at the south end of Starlight Park and a comfort station and storage building near the playground and picnic areas just south of East 174th Street viaduct upon NYSDOT's completion of park reconstruction, which follows Con Edison's remediation, at the site.

North of Bridge # 4, the main Greenway path travels along the west side of the Metropolitan Transportation Authority's West Farms Bus Depot parking lot, and under the I-95 (Cross Bronx Expressway) Viaduct to the intersection of East 177th Street with I-895 (Arthur Sheridan Expressway) and Devoe Avenue. Just north of I-95 and an existing ramp from northbound I-895 to southbound I-95, the steep slope down to the river will be cut back to create a more gentle slope to the river and open up views to the river and views beneath the I-895 Bridge over the Bronx River.

The multi-use path will split into an upper and lower level multi-use paths just north of the aforementioned ramp from northbound I-895 to southbound I-95, the upper path leading to the intersection of I-895 with East 177th Street and Devoe Avenue and the lower path passing under the I-895 bridge over the Bronx River to avoid the intersection. Several retaining walls will have to be built and an existing combined sewer outfall immediately north of I-895 will have to be modified or relocated in order for this path to be a fully accessible multi-use path. Completion of the lower path may occur at a later date than the rest of this project, as it is most logical complete in conjunction with a New York City Department of Environmental Protection (NYCDEP) project to relocate the combined sewer outfall (CSO) in the future.

The upper multi-use path will cross the entrance/exit to I-895 on a newly created crosswalk containing a median pedestrian refuge island reinforced with new crossing and traffic lights. The multi-use path will continue northward, roughly paralleling a realigned Devoe Avenue, then will curve west to meet the existing sidewalk on East Tremont Avenue. A wide tree lawn between the path and Devoe Avenue will provide shade to path users and buffer the path from traffic noise and pollution. To the west of the path, the ground will be sloped downward, and the top 2.66 to 3.12 meters (8'-8" to 10'-2") of the existing stone retaining wall that forms the existing river bank will be removed to lower the river bank to an elevation 0.54 meters (2") higher than the highest water level ever observed. The top of the resulting wall will be approximately 0.58 meters (23") above mean high water, and 2.02m (6'–7") above its base on the riverbed. A safety railing will be provided at the top of this wall.

From the north end of the park, the multi-use path travels west, across the East Tremont Avenue Bridge over the Bronx River. Immediately after crossing the river, the path will turn north to cross East Tremont Avenue at a new signalized mid-block crossing. The north side of East Tremont Avenue will be the northern terminus of this project. This terminus is being coordinated with NYCDPR to blend seamlessly into their Bronx River Greenway multi-use path from East Tremont to East 180th Street. Other plans by NYCDPR and NYSDOT facilitate continuation of the Bronx River Greenway to the Westchester County border.

The exact alignment of the paths between Bridge #4 and the path's intersection with I-895 and East 177th Street may be temporary if future construction associated with the rehabilitation of I-95 by NYSDOT and the possible installation of a sewer overflow storage conduit by NYCDEP require the path to be relocated. The final alignment will be determined as a result of these projects and community outreach, but access to and continuity of the Bronx River Greenway will be maintained throughout any construction per NYSDOT policy.

As part of this project, the intersection of I-895 with East 177th Street and Devoe Avenue, the intersection of East 177th Street with East Tremont Avenue and the intersection of Devoe Avenue with East Tremont Avenue will be reconfigured. Currently, East 177th Street and Devoe Avenue diverge from the intersection of I-895 with East 177th Street and Devoe Avenue in the shape of a "V." This creates two intersection points with East Tremont Avenue: one with East 177th Street and the other with Devoe Avenue. This project will consolidate the two intersection points on East Tremont Avenue into one point—condensing the "V" of East 177th Street and Devoe Avenue into a five lane section along the alignment of Devoe Avenue with a center median. The median will provide space for a planter and a pedestrian refuge island. This will improve crossing safety, vehicle capacity, and aesthetics of these intersections. It will also increase available land area adjacent to the Bronx River, allowing for improved landscaping and path environments at this location. ✷

Chapter D-2: Land Use, Community Facilities, Zoning and Public Policy

A. INTRODUCTION

This analysis assesses the Proposed Project's potential impacts on land use, community facilities, zoning, and public policy.

The project's land use study area is located in the southern section of the Bronx and is a 0.4 km (0.25-mile) radius from the project boundary. The study area is generally defined as the area bounded by East 180th Street to the north, the Bronx River Parkway to the east, East 165th Street/Watson Avenue to the south, and Vyse Avenue to the west (see Figure D-2-1). The study area covers portions of several neighborhoods including Bronx River, Soundview, Longwood, Crotona Park East, West Farms, and Bronx Park South.

Various sources were used to prepare this section, including field surveys, data, and reports supplied by local government agencies, interviews with representatives of government agencies, internet research, and geographic information systems (GIS) land use data derived from New York City Department of Finance Real Property Assessment Data (RPAD) files published by the New York City Department of Finance and the New York City Department of City Planning (NYCDCP). Zoning information is based on the New York City Zoning Resolution and zoning maps.

B. EXISTING CONDITIONS

LAND USE

PROJECT SITE

The Project Site is irregularly shaped and consists of several parcels of land located along a one mile stretch of the Bronx River between East Tremont and Westchester Avenues (See Figure D-2-1). The entire Project Site north of East 174th Street consists of undeveloped land under the jurisdiction of New York State Department of Transportation (NYSDOT). Between East 174th and East 172nd Streets, the Project Site consists of parkland, including Starlight Park. Starlight Park is an approximately 3.6-hectare (HA) (9-acre) park under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR). It is bounded by the river to the east and I-895 (Arthur Sheridan Expressway) to the west. Due to ongoing remediation for hazardous materials, Starlight Park has no amenities and is closed to the public. The balance of the parkland is bounded by the river to the west and the AMTRAK rail lines to the east and consists primarily of trees and fields with no amenities. It is generally inaccessible to the public and isolated from the surrounding residential neighborhoods. Another undeveloped parcel of land is located south of East 172nd Street between the river and the AMTRAK rail lines. In addition to parkland, the Project Site also includes two industrial sites. The industrial sites include the Apex Auto salvage site (Block 3769, Lot 49) and the New York City (City) Marshall Impound Lot, PDJ Simone (Block 3017, Lot 1), and consist of 70,190 and 74,874 square feet, respectively.

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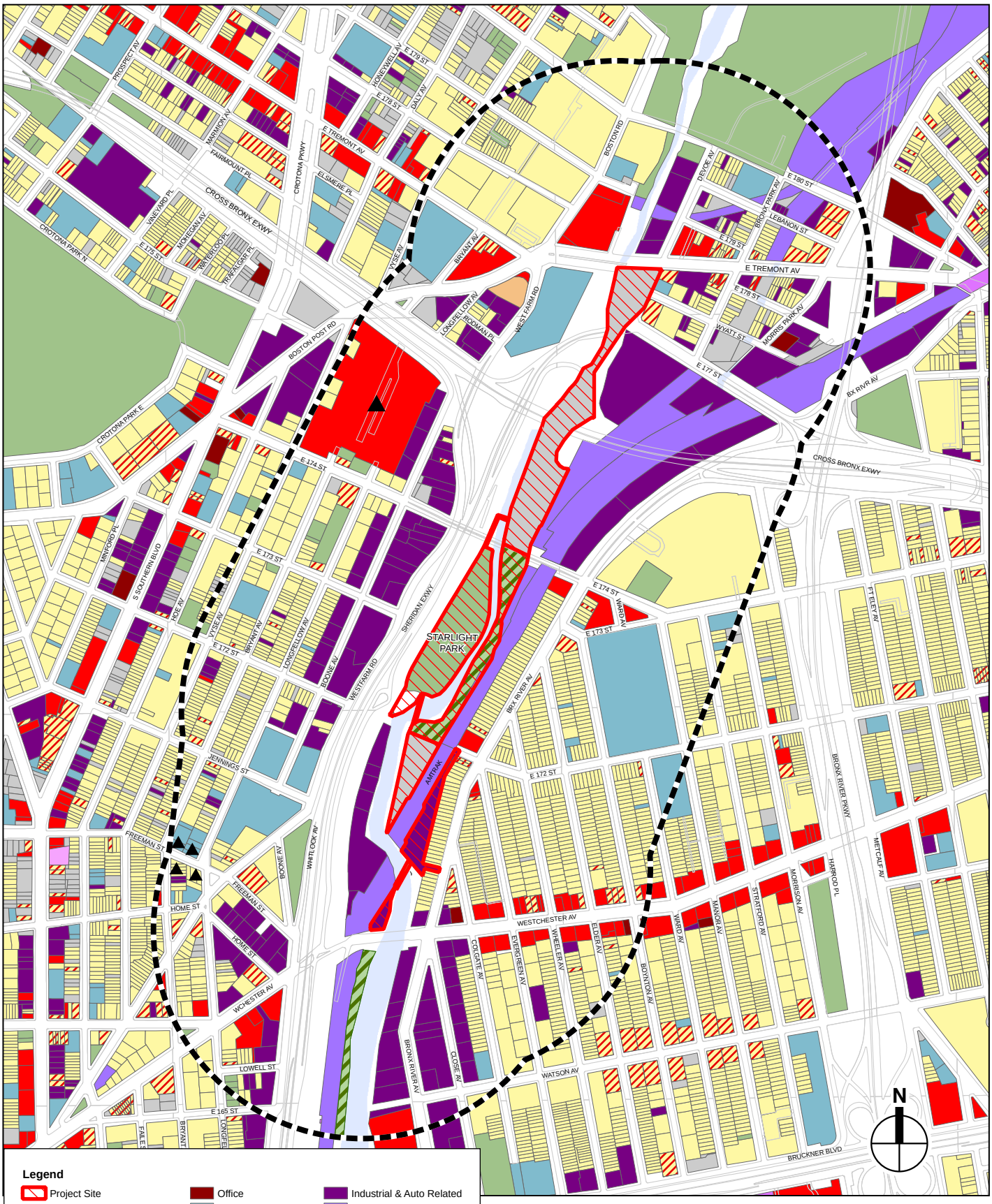

Legend

- Project Site
- 1/4-Mile Study Area
- Residential
- Res (with Ground Floor Retail)
- Hotels
- Commercial
- Office
- Institutional
- Entertainment
- Open Space
- Parkland
- Vacant/Undeveloped Parcel
- Industrial & Auto Related
- Utilities & Transportation
- Under Construction

0 800 FEET

SCALE

Land Use

Figure D-2-1

BRONX RIVER GREENWAY

STUDY AREA

The study area is predominantly residential. In addition to residential uses, the study area contains a mix of transportation infrastructure, industrial, and commercial uses, as well as parkland, community facilities, and vacant land.

Residential Uses

Residential uses are generally located along the eastern and western boundaries of the study area. Residential uses found within the study area are mixed and generally range from lower-density attached, semi-detached and garden apartment complexes to four- to seven-story apartment buildings. A few larger density, 13- to 21-story publicly assisted apartment buildings, under the jurisdiction New York City Housing Authority (NYCHA), are located in the northern portion of the study area along East 178th Street and Boston Road as well as East 174th Street and Bronx River Avenue.

Transportation Infrastructure and Industrial Uses

The Project Site and the Bronx River are nestled within an intricate network of transportation infrastructure and industrial uses. The Arthur Sheridan Expressway generally runs along the western edge of the Project Site. AMTRAK's Northeast Corridor/CSX tracks generally run along the eastern edge of the Project Site. In the southern portion of the study area (between Westchester Avenue and 172nd Street), the tracks cross the Bronx River to the western border of the site. Several roadways traverse the River including East 180th Street, East Tremont Avenue, Cross Bronx Expressway, East 174th Street, and Westchester Avenue. Several interchanges and ramps connecting these roadways to each other and the street network are also located within the study area.

Two elevated subway tracks are also notable elements in the study area. The Nos. 2 and 5 lines are located in the northern portion of the study area and the No. 6 line runs over Westchester Avenue in the southern section. During fieldwork in April 2004, another set of decommissioned elevated tracks in the northeastern portion of the study area were in the process of being dismantled.

Several auto-related and other industrial uses, including Hunts Point Auto Parts and Marine Boiler and Welding, are adjacent to the Project Site to the west (between East 172nd Street and Westchester Avenue). Industrial uses within the industrial corridor running north/south through the center of the study area primarily consist of one- and two-story warehouses and auto-related uses. The larger industrial and auto-related uses in the northeastern portion of the study area include the West Farms Bus Depot at 177th Street and Devoe Avenue, and the New York City Marshall's Impound Lot and Jenna Concrete Corp. on a large lot along Bronx River Avenue between 177th Street and East 174th Street.

Open Space and Parklands

In addition to the parkland and open space considered part of the Project Site, there are about 10 open spaces in the study area. Several parks within the study area are located along, and provide some access to, the Bronx River including River Park and Bronx River Park (West Farms segment). Both of these parks are located to the north of the Project Site (see Chapter D-3, "Open Space and Parklands" for more details). River Park is located along the northern boundary of the study area at East 180th Street and Boston Road on the western bank of the Bronx River. This park contains both active and passive space including a playground and

barbeque pits. There is a small waterfall in the park. Benches and a path are located along the river and provide views of the river. Bronx River Park is also located on the west side of the Bronx River and is hidden at the end of East 179th Street. It is a predominantly passive recreational space with a variety of amenities including tables, benches, and pathways that run along the river.

The decommissioned concrete plant located along the western bank of the Bronx River south of Westchester Avenue is the site of additional parkland in the southern portion of the study area. Although not fully developed as a publicly accessible open space, the concrete factory is under the jurisdiction of the NYCDPR and is therefore considered parkland.

Commercial Uses

East Tremont Avenue, Westchester Avenue, and Boston Road are commercial thoroughfares in the study area. Businesses range from small commercial establishments that serve the local population, such as laundromats and small grocery stores, to larger chain stores. There is a larger commercial strip mall with a multilevel parking garage located at the intersection of Boston Road and East Tremont Avenue. Other commercial uses are scattered throughout the area.

COMMUNITY FACILITIES

No community facilities are located within the Project Site.

Several community facilities are scattered throughout the study area to serve local residents and mostly consist of schools and religious institutions. The community facility closest to the Project Site is I.S. 167, the Lorraine Hansberry School located at the corner of West Farms Road and East Tremont Avenue, adjacent to the Bronx River to the west. James Monroe High School is the largest institutional use and occupies two blocks with its building and playing fields along East 172nd Street in the eastern portion of the study area. No police stations or fire houses are located within the study area.

ZONING

PROJECT SITE

The portion of the Project Site north of East 174th Street is zoned R7-1 medium density residential (for a full description of zoning districts, see Table D-2-1).Between East 174th and East 172nd Streets, the Project Site is mapped as parkland and therefore has no designation. The area of the Project Site south of East 172nd Street has an M1-1 light manufacturing designation (see Figure D-2-2).

STUDY AREA

Much of the study area is zoned for residential use with some manufacturing and commercial districts located along major roadways.

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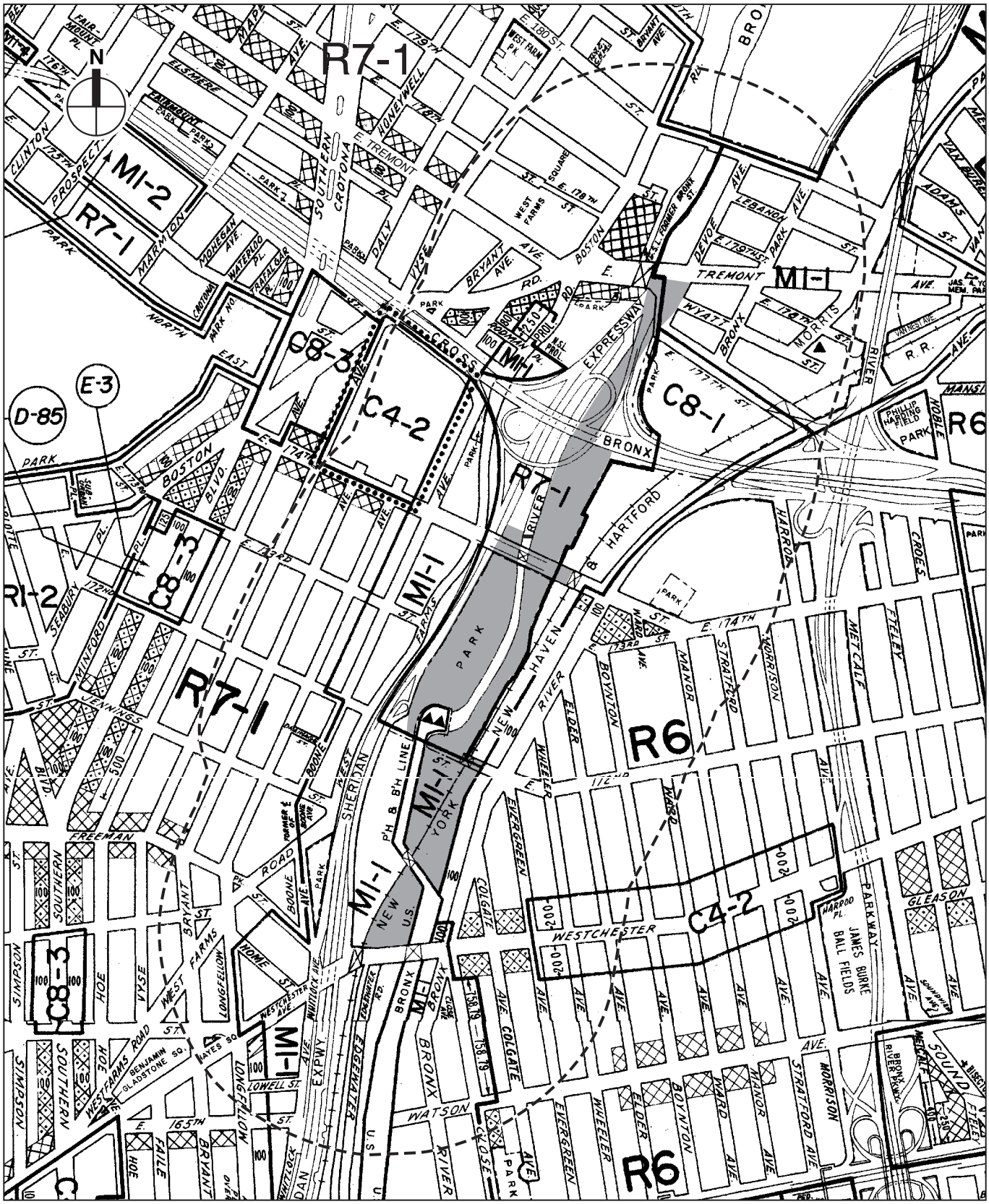


Zoning
Figure D-2-2

Table D-2-1
Zoning

Zoning District	Permitted Uses and FAR
General Residential Districts:	Commercial and manufacturing uses are prohibited. Community facilities permitted.
R6, R7-1	General residence district, medium density apartment house district. Maximum FAR for R6 is 0.78 to 2.43. Maximum FAR for R7-1is 0.87 to 3.44.
General Commercial Districts:	Residential and community facility uses permitted except in C8 districts. Commercial districts can be mapped as zoning districts or as overlays in residential districts. Commercial overlays allow low-density development of commercial uses.
C1-2, C1-4	Local shopping and services often mapped as overlays, sometimes along major avenues. Maximum FAR is 1.0 to 2.0.
C2-2	Local shopping and services often mapped as overlays, generally along major avenues—serves a wider neighborhood than C1 overlays. Maximum FAR is 1.0 to 2.0.
C4-2	Shopping centers and offices in more densely built areas. Maximum FAR is 3.4.
C8-1	Automotive and other heavy commercial uses. Residential uses are not permitted. Maximum FAR for C8-1 is 1.0.
Manufacturing Districts:	Residential uses generally prohibited.
M1-1	Light manufacturing use; located adjacent to low density residential areas and serve as buffers of heavy manufacturing areas. Maximum FAR for M1-1 is 1.0

Note: FAR is floor area ratio. Maximum floor area allowable on a lot is the maximum FAR control number multiplied by the lot area.
Source: *New York City Zoning Resolution*, New York City Department of City Planning

An R7-1 medium density district covers much of the western section of the study area. A large R6 medium density district is located in the eastern portion of the study area. Light manufacturing (M1-1) districts make up a portion of the industrial corridor that runs lengthwise through the middle of the study area. Several commercial districts are scattered throughout the study area. A C8-1 heavy commercial district runs along the AMTRAK rail line in the eastern portion of the study area. A superblock in the northern portion of the study area, off the Cross Bronx Expressway, was rezoned in 1998 from light manufacturing to C4-2 commercial designation. The new zoning is designed for a shopping center that is under construction on the site. A C4-2 major commercial district runs along Westchester Avenue. Several commercial overlays are located throughout the residential districts and accommodate businesses that provide services to both the local community and a larger area.

PUBLIC POLICY

Crotona Park East, located in the western portion of the study area, was part of the Department of City Planning's Neighborhood Land Disposition Plan completed in 1992. West Farms and Bronx Park South neighborhoods, in the northern portion of the study area, are located within the boundaries of the Bronx Park South/Crotona Park North Neighborhood Land Disposition Plan, which was completed by the Department of City Planning in 1993. These plans provided a framework for guiding the disposition recommendations of vacant city-owned properties in the community. Crotona Park East is also part of the area covered by Community District 3's 197-a

Plan called "Partnership for the Future: a 197-a Plan for the Revitalization of Community District 3" in 1993. The five main goals of the 197-a Plan include: (1) re-establish the district as a dynamic, viable community; (2) increase the district's population to 100,000 by the year 2000; (3) provide a viable economic base through the provision of job training and the creation of labor intensive opportunities; (4) maintain, develop, and expand the district's supporting infrastructure; and (5) maintain parks and recreation areas throughout the district.

The Crotona Park East study area also has several community development organizations which focus on housing, education, open space, and other community issues. These organizations include the Mid-Bronx Desperadoes which has built and rehabilitated housing, manages properties and offers job training programs.

C. PROBABLE IMPACTS

NO ACTION

Several commercial and residential projects are expected to be completed within the study area by 2006.

The largest Proposed Project is the MBD New Horizons Retail Center. This retail development will be located in the northeastern portion of the study area on a superblock bounded by East 176th Street/Cross Bronx Expressway to the north, Boone Avenue to the East, East 174th Street to the south and Vyse Avenue to the west. It will be anchored by an approximately 50,000-sf Pathmark Supermarket with 21 additional businesses. The total development will consist of approximately 135,000 sf of retail space and a large accessory parking lot. The retail center was under construction during fieldwork conducted in April 2004. It is expected that it will be occupied and open for business in mid-2004.

During fieldwork conducted in April 2004, several residential and church-related buildings were under construction in the southwestern portion of the study area on Freeman Street between Bryant and Longfellow Avenues. On-going construction was also observed on the Arthur Sheridan Expressway, adjacent to the Project Site to west. Expressway repaving and improvements are expected to be completed by 2005.

In the northeastern portion of the study area, an elevated rail line was demolished leaving several parcels of vacant land just east of Bronx Park Avenue between East 177th Street and East 180th Street. These properties will remain under the ownership of the New York City Transit Authority but are expected to be leased to residents and businesses on a long-term basis. It is likely that residents adjacent to the sites will use them as accessory space (driveways, yards, etc.). Commercial uses could include one- to two-story retail businesses, accessory parking and storage areas.

The Bronx River Greenway extends from the Bronx/Westchester County border to the East River project. The Proposed Project is a major segment of the greenway and would connect to NYCDPR's planned redevelopment of the former concrete plant as a park to the south and to NYCDPR's Bronx River Park (West Farms segment) of the Bronx River Greenway to the north. Independent of the Proposed Project, development of the Bronx River Greenway could be occurring within the study area. It is likely that improvements to these segments would overlap with the construction period for this project.

PROPOSED PROJECT

The following section assesses the potential impacts of the construction and operation of this segment of the Bronx River Greenway project (see Chapter D-1 "Project Description" for a full description of the Proposed Project) on land use, community facilities, public policy and zoning.

CONSTRUCTION

As mentioned in the Chapter D-1 "Project Description", some on-street improvements are planned as part of the Proposed Project along East Tremont and Devoe Avenues, East 177th Street and the terminus of the Arthur Sheridan Expressway. Therefore, the potential impacts to service delivery of community facilities (fire and police protection etc.) in the study area during the construction period were assessed.

The Lorraine Hansberry school is adjacent to the proposed street improvements to the south. While the proposed street improvements are expected to result in the closure of several lanes of traffic, they would not result in a total closure of the streets or sidewalks. Therefore, the proposed construction would not prevent school buses, students, and faculty from gaining access to the school. As mentioned above in the community facilities section, no police or fire stations are located within the study area. Therefore the proposed street improvements would not directly block access to or from these services. Given that the street would remain open, emergency vehicles would continue to be able to use these streets to access the entire study area. The proposed on-street improvements would not obstruct the delivery of services of community facilities within the study area. Therefore, no significant adverse impacts to community facilities are expected to occur during the construction phase of the Proposed Project.

OPERATION

Land Use

The Proposed Project would provide residents, workers, and visitors improved Bronx River waterfront access and recreational opportunities via the use of the multi-use path. Most of the Project Site consists of inaccessible parkland with no amenities. The Greenway would not represent a change in land use on the majority of the Project Site but would enhance existing parkland and would provide a link from the communities and commercial areas to much of the parkland adjacent to the Bronx River. The Greenway would alter land use on two parcels of land by displacing the auto-related uses on these parcels and replacing them with park space (see Chapter D-4 "Economic Conditions" for further discussion of the displacement). These businesses are not water dependent, and do not contribute substantially to a defining element of the neighborhood's land use. As mentioned earlier, the Proposed Project is one of many segments that would ultimately result in a greenway that runs from Westchester County to the East River; therefore, the two industrial properties on the Project Site are an important link within this segment. In addition, given that the Apex Auto site is adjacent to residential uses, the proposed parkland would be a more compatible use. The Proposed Project would provide substantial improvements to existing parkland that would be compatible with the area's residential neighborhoods. It would also provide access to the neighborhoods that have been isolated from the River and surrounding parkland. Therefore, the Proposed Project is not expected to result in any significant adverse impacts to land use.

Zoning

A portion of the Project Site, between East 174th and East 172nd Streets, is currently, and will remain, designated parkland. For public benefit, it is important to have mapped parkland and open spaces in residential districts. Therefore the parkland designation would be compatible with the northern portion of the Project Site, between East Tremont Avenue and East 174th Street that is currently zoned for residential use. The Proposed Project is compatible with the study area given that it is mostly zoned for residential uses. As a result of the Proposed Project, two industrial sites located within an M1-1 light manufacturing zone would become the multi-use path and open space. The acquisition of these two sites would be beneficial as they are an important link within this Greenway segment and the Greenway as a whole. In addition, Greenway is more compatible with the adjacent residential district than the existing manufacturing designation. The Proposed Project would not have an adverse impact on the surrounding light manufacturing and heavy commercial zoning districts; in fact, it is likely that the employees of the businesses within these zones would benefit from the proposed Greenway. Overall, the Proposed Project would be beneficial to the area and would not result in significant adverse impacts to zoning.

Public Policy

As part of the disposition plans by DCP, much of the vacant, city owned property within the study area has been redeveloped into residential and commercial property. The proposed Greenway would provide an important amenity and would be compatible with this development. The Proposed Project would also be consistent with Community District 3's 197-a Plan, “Partnership for the Future: a 197-a Plan for the Revitalization of Community District 3". The proposed greenway would apply to the goals of maintaining parks and recreation throughout the area as well as helping to re-establish the district as a dynamic, viable community. Providing publicly accessible open space is an objective of many of the community development organizations located within the study area. Therefore, the proposed property would be consistent with public policy for the study area. ✷

Chapter D-3: Open Space and Parklands

A. INTRODUCTION

This chapter addresses the Proposed Project's potential effects on open space and parkland. Specifically, the analysis assesses the project's potential impacts on public open space during both construction and operation. Construction of the Greenway may affect the usage of adjacent parks or require the use of adjacent parks for construction staging and will be discussed. During operation, this project would substantially increase the amount of open space in the area, therefore a qualitative discussion of the benefits associated with the Greenway will be provided.

B. EXISTING CONDITIONS

Open space and parkland located within or adjacent to the Project Site include Starlight Park, Bronx River Park (West Farms segment), the planned park at the former concrete plant site, and other parkland.

PROJECT SITE

Within the Project Site, parkland is located on both sides of the Bronx River between East 174th and East 172nd Streets. Starlight Park consists of approximately 3.6 hectares (HA) (9 acres) and is located on the western bank of the river. I-895 (Arthur Sheridan Expressway) runs along the western edge of the park. Starlight Park is a New York City Department of Parks and Recreation (NYCDPR)-operated park. Remediation for hazardous materials is being undertaken at Starlight Park; therefore the park is closed to the public and contains no amenities.

Unimproved, inaccessible land covered by vegetation is located on the eastern bank of the Bronx River. This land is under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR), generally across from Starlight Park between East 172nd Street and East 174th Street, of New York State Department of Transportation (NYSDOT) generally south of East 172nd Street and north of East 174th Street, adjacent to the Bronx River, and of the Metropolitan Transportation Authority (MTA) for parcels adjacent to Amtrak both south and north of East 174th Street.

ADJACENT TO THE PROJECT SITE

Parks located within the study area which do not border the proposed Greenway would not be affected because of the increased distance from construction activities and/or the fact that the intervening structures between the public open spaces and the construction activities would function as a screen to shield parks from impacts. Therefore, only open spaces in immediate proximity of the Proposed Project are analyzed.

Bronx River Park and the planned park at the former concrete plant site are both located along the west bank of the Bronx River. Bronx River Park is entirely under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR) and the concrete plant site is in the

jurisdiction of NYCDPR along the waterfront only. Certain parts of the Concrete Plant Park are in the jurisdiction of New York City Department of Transportation and is anticipated to revert to NYCDPR upon completion of the Bruckner/Sheridan Interchange reconstruction. Bronx River Park is a 0.2 HA (0.51-acre) park north of the Project Site in a remote location at the end of East 179th Street. The elevated tracks of the Nos. 2 and 5 subway lines cut across the southern portion of the park. The open space is adjacent to a residential complex and, due to its remote location, it is assumed that it is mostly used by those residents. The park's amenities include paths and benches that allow for the appreciation of the river. This is a predominantly passive recreational space with trees, landscaping, and tables with markings for games (i.e., chess and checkers). The park has also been used as a launch point for canoes and kayaks.

The site of the planned park at the former concrete plant site is located to the south of the Project Site, south of Westchester Avenue and the elevated No. 6 subway line. The concrete plant's structures and associated piers are dilapidated and vacant and remain on the site primarily fenced off and inaccessible. Although it contains almost no amenities, a large area of the parcel is under the jurisdiction of the NYCDPR and is therefore considered parkland.[*] In addition to the remnants of the factory, the parkland consists of a dirt road and unimproved vegetated areas and is accessible from Westchester Avenue. Several boulders lining the dirt road have been painted by neighborhood residents to decorate the unimproved parkland. A community garden for growing vegetables is located within the parkland. The southern portion of the site has some waterfront access and is occasionally used as a disembarking point for canoes and kayaks.

C. PROBABLE IMPACTS

NO ACTION

PROJECT SITE

In the future without the Proposed Project, remediation at Starlight Park will continue. The park will continue to be closed and off-limits to the public. With or without the proposed Greenway, after remediation is completed, the park would be restored as an open space. Without the Proposed Project, amenities of the renovated park would probably include primarily active recreational space (i.e., baseball fields).

Changes are not expected to occur to the parcel of parkland adjacent to Starlight Park to the east. Additional open space would not be created on the Project Site.

ADJACENT TO THE PROJECT SITE

By 2006, construction of improvements to Bronx River Park and the planned park at the former concrete plant site still be underway as part of the Bronx River Greenway corridor. Some improvements to the planned park at the former concrete plant site may already be in place including landscaping and better access to the waterfront. These two sections of the Greenway Corridor will be built with or without the proposed segment. Without the Proposed Project, these segments will not be linked and the entire Greenway Corridor will be missing an important piece.

[*] The western portion of the parcel is under the jurisdiction of NYSDOT for future use as construction staging for the Bruckner/Sheridan Interchange project

PROPOSED PROJECT

CONSTRUCTION

The general effects of construction activities on open space and transportation and recreational improvements that would occur under the Proposed Project are discussed below.

Project Site

Starlight Park is undergoing remediation for hazardous materials. The remediation work in Starlight Park is the responsibility of the Consolidated Edison Company of New York (Con Edison), and is being performed by Con Edison under the supervision of the NYSDEC. As a result of the remediation, the park is closed to the public and has no amenities. During the construction of the Proposed Project, portions of the park will be used for construction staging for both the park itself and the new improvements in the proposed Greenway. Given that the park is not and will not be open, construction of the Proposed Project will not affect usage of the park.

In addition, ultimately, the park will be reconstructed as part of the project. During construction of the Proposed Project, the entire segment, including Starlight Park, would be closed to the public. The closure of the park for its own reconstruction is not considered a significant adverse impact. Although the proposed NYSDOT Greenway project will use portions of Starlight Park as a staging area for construction of the Proposed Project, this project will proceed as a joint park/transportation project development. There is a long history of coordination on the development of the Greenway that has occurred from the project's inception in 1999 to present day. This has included joint public outreach to community boards, extensive coordination through the Bronx River Alliance's many not-for-profit and government members, and coordination between New York State Department of Transportation designers with NYCDPR's planners and designers. The multi-use path and bridges were jointly planned with NYCDPR for the project and also to be consistent with NYCDPR's planned park at the former concrete plant site and proposed Bronx River Park West Farms Segment. The provisions of 23CFR771 and related FHWA policy guidance allow for such joint development of a transportation project that is concurrently planned and developed with a public park, which precludes the need for a Section 4(f) statement. Therefore, Section 4(f) does not apply.

The parkland on the eastern bank of the Bronx River, across the river from Starlight Park, is unimproved and inaccessible. Therefore, construction would not affect its usage.

Adjacent to the Project Site

Construction of the Greenway would not require the use of either Bronx River Park or the site of the planned park at the former concrete plant site. Therefore, the construction of the Proposed Project is not expected to affect the usage of these adjacent parks.

In addition, noise and dust during construction are not expected reduce the overall desirability of adjacent and nearby open spaces. Although within close proximity, Bronx River Park is not immediately adjacent to the Project Site. Several buildings, East Tremont Avenue and elevated subway lines separate the Project Site from Bronx River Park. Westchester Avenue and elevated subway tracks are situated between the Project Site and the planned park at the former concrete plant site. It is likely that these would act as barriers and would insulate these open spaces from noise and dust generated by the Proposed Project during the construction period.

OPERATION

The Proposed Project would result in the development of 6.5 HA (16 acres) of land with a multi-use path and open space along the Bronx River between East Tremont and Westchester Avenues (for details, see Chapter D-1 "Project Description"). The multi-use path will be a transportation facility used for cycling, skating, walking, and exercising. Overlooks for appreciation of the Bronx River and improved parkland would be provided along the path. Pedestrian bridges connecting the multi-use path and open space on both sides of the river will be constructed. The project will create a naturalized shoreline with new intertidal wetlands, and plant native vegetation to provide habitat for Bronx River wildlife. The Greenway would serve the residents and workers in neighborhoods bordering the Proposed Project. As an important segment in the entire Greenway Corridor, it would also serve people from the rest of the city and Westchester. The park will offer public access to the waterfront in an area that has long been separated physically and visually from the Bronx River, despite its geographic proximity. Access to other segments of the Greenway, Bronx River Park to the north and the site of the planned Concrete Plant Park to the south, will also be created. An amphitheater will also provide the area with a performance space. Without the Proposed Project, these benefits would not be provided.

As discussed above, Starlight Park will be reconstructed after remediation for hazardous materials is completed. This will provide additional active recreational space, including basketball courts, baseball diamonds, a soccer field, and a variety pieces of play equipment. In addition, a boat house and a floating dock for non-motorized boat access would also be provided at Starlight Park. The multi-use Greenway path would loop around Starlight Park. Although Starlight Park will eventually be reopened to the public for use as a park, the amenities in the park without the Proposed Project will not be comparable to those that will be provided with the Proposed Project. ✷

A. INTRODUCTION

Although the construction of the Bronx River Greenway is not expected to have any major economic consequences, there will be four entities that will potentially be displaced by the Proposed Project, two of which will be acquired by NYSDOT under the New York State Eminent Domain Procedures. As a result, this section will assess any potential impacts that may occur due to direct business displacement as well as address any physical impacts on existing businesses due to any projected diversions during the construction period.

B. EXISTING CONDITIONS

The Project Site is located between East Tremont and Westchester Avenues as the northern and southern boundaries respectively. Following a north-south axis, parts of the Project Site are separated by the Bronx River and will be connected by four bridges. The study area is roughly defined as the area within a 0.4 km (0.25-mile) radius of the Proposed Project and generally extends from Watson Avenue to the south and East 180th Street to the north. Within the 0.4 km (0.25 mile) study area boundary are five distinct residential neighborhoods that surround the proposed Bronx River Greenway project. The following analysis identifies the businesses and employment areas within these five neighborhoods.

CROTONA PARK EAST

The Crotona Park East neighborhood is located just west of the Proposed Project. The neighborhood is mostly residential with a majority of the industrial uses located east of Longfellow Avenue along Boone Avenue and West Farms Road. The southern section of Crotona Park East, which is defined as the area south of Jennings Street, is predominately made up of auto-related uses such as a car wash, a towing business, parking lots, and an auto repair and spare parts businesses. Other industrial uses in this area include a private ambulance service, and a manufacturing business that fabricates metal products. Commercial uses such as a dry cleaner, deli, and a fast food establishment line Westchester Avenue.

There are a few businesses located between I-895 (Arthur Sheridan Expressway) and the Bronx River just north of Westchester Avenue between Freeman Street and East 172nd Street. Some of the businesses include a large auto parts and accessories business, a welding facility, and a baskets and crates manufacturer. Though not a business, the NYC Marshall Impound Lot (aka PDJ Simone), which is facing potential displacement as a result of the Proposed Project. The entrance of the impound facility fronts Westchester Avenue and extends north alongside the Bronx River.

Further north along Boone Avenue and West Farms Road, the industrial uses are primarily warehousing and manufacturing. Boone Avenue contains more one-story warehouse buildings that are mainly used for shipping and receiving and for storage facilities. Other uses on Boone

Avenue include auto-related businesses, a commercial laundry facility, and an iron works business. Facing the Arthur Sheridan Expressway, businesses along West Farms Road are involved in heavier industrial uses such as structural metal fabricators, lumber supply, iron and metal works, and paint supply. Other uses in the area include a laundry equipment provider, auto recovery, and a welding facility.

BRONX PARK SOUTH

The Bronx Park South community, which is located north of I-95 (Cross Bronx Expressway) and west of Boston Road and West Farms Boulevard, is predominately residential with some commercial and industrial uses. Commercial uses such as a parking garage and vehicle repair shops are located along Bryant Avenue and Boston Road. Heavy industrial uses along West Farms Boulevard include a manufacturer of rolling steel doors and windows and stone cutting and stone products while lighter industrial uses such as auto repair shops and a parking garage facility are located along Boston Road.

BRONX RIVER

The Bronx River neighborhood is located east of the Bronx River and the Proposed Project. Similar to Bronx River South in the north of the study area, Bronx River is mostly residential with much of the industrial uses located along the Bronx River and Bronx River Avenue. Businesses along the northern part of Bronx River Avenue range from automobile storage facilities, vehicle impound, a truck parking and storage business, a concrete manufacturing facility, and several auto related businesses. Behind these businesses, alongside the river, is the AMTRAK Northeast Corridor rail line as well as the northern section of the Project Site. Commercial businesses in the area consist of restaurants, a supermarket, delis, tax services, a liquor store, and fast food establishments along East 174th Street between Bronx River and Manor Avenues.

Further south on Bronx River Avenue between East 172nd Street and Westchester Avenue is the entrance to Apex Auto, also facing potential displacement by the Proposed Project. Located between residential homes, Apex Auto is a used auto parts business that occupies a large lot behind the residential houses and fronts the Bronx River along its southern border. Industrial uses at the intersection of Bronx River and Westchester Avenues are auto related uses, including a gas station and auto repair shops as well as a manufacturer of advertising signs. Much of the commercial uses such as eating establishments, barber shops, hair salons, delis, laundry facilities, and retail shopping are located along Westchester Avenue.

SOUNDVIEW-BRUCKNER

The Soundview-Bruckner neighborhood is south of Westchester Avenue. This section of the study area has a high concentration of industrial uses along Bronx River Avenue and Close Avenue between Watson and Westchester Avenues. All of the businesses in this area are located in one to two-story warehouse buildings with a variety of tenants such as a Christmas decoration company, two fuel oil companies, a car dealership, and a dairy manufacturing business along Bronx River Avenue. Businesses along Close Avenue included a pulverizing warehouse, auto related uses, an egg depot, a fitness management business, a letter signs company, and a sand, abrasives, and sandblasting equipment dealer.

WEST FARMS

The West Farms community is located north of the Cross Bronx Expressway and east of the Boston Road. The area of West Farms which is located within the boundaries of the study area is made up of residential, commercial, retail and industrial uses. Much of the industrial uses are transportation related such as the elevated No. 2 subway, the AMTRAK-Hellgate rail line, and vacant lots that were at one point used as subway overpasses. Industrial uses in this neighborhood are scattered along Boston Road North and Devoe Avenue and include businesses such as a medical warehouse facility, car wash, a gas station, a sheet metal manufacturer, millwork facility, a construction firm, a furniture warehouse, and a public parking facility located alongside the Bronx River on East 179th Street.

A small shopping area with a supermarket, a pharmacy, a dry cleaners, and fast food establishments is located on a commercial block on Boston Road between East Tremont Avenue and East 179th Street.

A commercial parking lot and Christy's Rubbish Removal, both located south of East Tremont Avenue and west of Devoe Avenue, will be displaced as part of the Proposed Project. These businesses lease the property from NYSDOT on a month-to-month basis, and will have to vacate the property prior to construction.

C. PROBABLE IMPACTS

NO ACTION

In the future without the project, no changes to the Project Site are expected to occur by the build year 2006 and it is assumed that the two existing businesses on the Project Site will remain and continue operation in the future.

PROPOSED PROJECT

As mentioned above, the Proposed Project could result in the direct displacement of four existing entities and construction related impacts due to roadway reconstruction of the intersection of the Arthur Sheridan Expressway with East 177th Street and Devoe Avenue and the intersection of East Tremont and Devoe Avenue. In addition, two businesses may be affected by the proposed ramp and portal at the 172nd Street entrance to the Greenway.

DIRECT DISPLACEMENT

The development of the Proposed Project will require the acquisition and permanent displacement of businesses currently operating on the Project Site. As previously discussed, there are three private businesses (Apex Auto, Christy's Rubbish Removal, and a commercial parking lot) and one City entity (NYC Marshall Impound Lot) with a total of 40 employees located on the Project Site that will be displaced. According to the New York State Department of Labor (NYSDOL), total employment in the Bronx was approximately 188,151 in the third quarter of 2003. Within zip code 10460, which includes the 0.4 km (0.25 mile) study area, total employment was approximately 6,348 during the same time period. The 40 employees within the Project Site represent less than 0.02 percent of total employment in the Bronx and within the 10460 zip code boundary.

Because there is a substantial amount of industrial space available within the Bronx, it is likely that these businesses could relocate within the borough, retaining all the jobs within the City. According to IGDNYC, Inc., a commercial real estate brokerage company, there is approximately 765,000 square feet of vacant industrial space available for lease within the Bronx as of May 2004. Of the 765,000 square feet, approximately 456,000 square feet consists of industrial buildings that are two stories or less. The asking rent for industrial space in the Bronx is about $10 per square foot.

In addition to the availability of alternate industrial sites within the Bronx, the two businesses face direct displacement through the New York State Eminent Domain Procedure, which entitles them to receive a relocation package from NYSDOT which includes financial coverage for certain moving costs and re-establishment expenses, and use of brokerage services to find alternative locations. A Draft Conceptual Stage Relocation Plan was prepared by NYSDOT in April 2002, and is included in Appendix H. NYSDOT R-11 staff have located suitable relocation areas for the two businesses to be acquired. NYSDOT will continue to work with Apex Auto and NYC Marshall Lot (PDJ Simone), Community Boards #3, #6, and #9, and commercial real estate brokerage firms to select appropriate relocation properties for these businesses. As a result, there would be no significant displacement impact.

The two lessees of NYSDOT property in the northern portion of the Project Site—the commercial parking lot and Christy's Rubbish Removal—will have to vacate the property prior to construction. As described above, these businesses lease the property from NYSDOT on a month-to-month basis. Both businesses are using NYSDOT Right-of-Way without NYSDOT's permission. For that reason, Christy's Rubbish Removal and the commercial parking lot will be required to vacate with no relocation assistance provided by NYSDOT. Therefore, the Proposed Project does not represent a significant displacement impact.

CONSTRUCTION

The construction work for the Bronx River Greenway consists of roadway reconstruction and sidewalk improvement which will occur on the northern part of the Proposed Project. The construction work will be completed in seven phases. Each phase would take approximately two months for a total of 14 months. Sidewalk reconstruction would temporarily affect access to businesses within the project limits on Devoe Avenue (second phase), East 177th Street (sixth phase), East Tremont Avenue (seventh phase). Sidewalk construction will temporarily inconvenience businesses for two months per phase, and access to all businesses will be maintained during construction activities.

Reconstruction of the roadway and construction of new curbs and sidewalks in front of the McDonald's and car wash, both fronting on East Tremont Avenue, will require temporary easements. However, access to these businesses will be provided throughout the construction period. Although sidewalk replacement along Devoe Avenue, East Tremont Avenue and East 177th Street will require temporary easements, Therefore, because businesses will always have access and the construction work is temporary, the Proposed Project will not have significant construction impacts.

Two businesses (Bronx River Tire and Wheel, Inc. and Villa Ramos Grocery) may be temporarily affected by the proposed portal and ramp at the 172nd Street entrance to the Greenway. Although access to these businesses will be maintained during construction, the number of parking places for use by customers of Bronx Tire and Wheel, Inc. will be reduced both during construction and permanently. The presence of construction equipment and

activities may result in some reduction or an increase in patrons of Villa Ramos Grocery during construction. However, these impacts are temporary, and are therefore not expected to be significant.

Permanent Easements are required for installation and future maintenance of retaining walls in backyards of residential properties along Bronx River Avenue approximately between Colgate Avenue and East 172nd Street. However, during final design, special studies will be conducted to minimize and/or avoid impacts to the residential properties. Anticipated demolition of sheds or garages on the properties would be reimbursed to the property owner at fair market value as part of the property acquisition process. ✷

A. INTRODUCTION

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This Executive Order is designed to ensure that each federal agency "shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

In April 1997, the US Department of Transportation (USDOT) issued the USDOT Order on Environmental Justice to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2) to summarize and expand upon the requirements of Executive Order 12898. This chapter analyzes the Proposed Project's potential impacts in terms of their effects on minority and low-income populations, to determine whether it has any disproportionately high and adverse impacts on those populations.

B. METHODOLOGY

This analysis was prepared following the methodology set forth in the U.S. Department of Transportation's Final Order on Environmental Justice, April 1997. This involves (1) identifying potential adverse environmental impacts and the area to be affected (i.e., establishing a study area); (2) determining whether potential adverse environmental impacts are likely to affect a potential environmental justice area (i.e., whether low-income and/or minority populations are present in the study area); and (3) identifying whether potential adverse environmental impacts would disproportionately affect low-income and minority populations.

ESTABLISH STUDY AREA

The Proposed Project aims to provide a path for cyclists and pedestrians along the Bronx River from Westchester Avenue and East Tremont Avenue in the Bronx. The potential significant adverse environmental impacts that could result from the Proposed Project are associated with physical impacts on residents during the construction period. The study area for the environmental justice analysis was defined to include all locations where significant construction impacts can potentially occur—the area within a 0.4 km (0.25-mile) radius mile of the project site.

IDENTIFY POPULATION OF CONCERN

The next step in the analysis is to determine whether low-income or minority populations are present in the study area. Following USDOT's methodology, to identify minority and low-income populations within the study area, demographic information was obtained from the U.S. Census Bureau for the year 2000. The U.S. Census Bureau collects information using various

geographic units such as census tracts, block groups, and blocks. For the purposes of this analysis, demographic data such as population, race, median household income, and poverty status were compiled at the block group level within the environmental justice study area. All block groups that fall at least 50 percent within the study area were included in the analysis. These include Census Tract 52, Block Group 1; Census Tract 54, Block Groups 2 and 3; Census Tract 56, Block Groups 1 and 2; Census Tract 60, Block Group 1; Census Tract 62, Block Group 1; Census tract 121.01, Block Groups 1, 2, and 4; Census Tract 121.02, Block Group 1; Census Tract 123, Block Groups 1 and 2; Census Tract 157, Block Groups 1-4; Census Tract 161, Block Groups 1 and 2; Census Tract 220, Block Group 1; Census Tract 359, Block Group 1; and Census Tract 361, Block Groups 2, 4, and 5. In addition, data was compiled for Brooklyn as a whole and for New York City, to allow for a comparison of study area characteristics to a larger reference area.

IDENTIFICATION OF MINORITY COMMUNITIES

USDOT's policy defines minorities to include Blacks, Hispanics, Asian Americans, American Indian and Alaskan natives. In identifying minority residents within the study area, data from the U.S. Census Bureau was used to determine the population characteristics for the study area. The following information was collected for each block group:

- Data on racial and ethnic characteristics: The population in each block group within the study area was characterized using the following racial categories provided in the 2000 Census: White, Black, Asian, and "Other." In addition to racial characteristics, the 2000 Census also includes information on Hispanic origin, which is considered to be an ethnic rather than racial characteristic. People of this ethnic category can be any race.
- Total percentage of minority population: Because Hispanic residents may be of any race, people who characterized themselves as White, Black, Asian, and Other in the 2000 Census may be non-Hispanic or Hispanic. To determine the total number of minority residents in each block group, the number of Non-Hispanic, Black, Asian, Other, and Hispanics were tallied.

According to the guidance, a study area may be concluded to have a minority population when the percentage of minorities in a study area is "meaningfully greater" than the minority percentage of the general population or when the percentage of minorities exceeds 50 percent.

IDENTIFICATION OF LOW-INCOME COMMUNITIES

Data were compiled on the percentage of persons in each block group in the study area living below the poverty threshold ($17,029 for a family of four, based on 2000 Census data). As another measure of low-income status, the median household income was also gathered for block groups, and an estimate was made of the median income of the study area. A low-income community is defined as any area where the low-income population (i.e., percent living below the poverty threshold) is equal to or greater than New York City's poverty level of 20.8 percent of the total.

C. IDENTIFICATION OF AFFECTED POPULATION WITHIN THE STUDY AREA

Using the methodology described above, the study area comprises four environmental justice neighborhoods, including Bronx Park South, Bronx River, Crotona Park East, and West Farms

(Figure D-5-1). The characteristics of the entire study area as well as each of the four neighborhoods are summarized in Table D-5-1 and described below.

According to the 2000 Census, the one quarter mile study area had approximately 27,000 residents of which 40 percent are Other, 35 percent are Black, 24 percent are White and less than 2 percent are Asian residents. Compared to Bronx County, the study area has less White residents but relatively the same percentages of Black, Asian and Other residents. In contrast, New York City has 45 percent White, 27 percent Black, 19 percent Other and less than 10 percent Asian. Hispanic residents within the study area make up 65 percent of the total population while Bronx County had 48 percent and New York City had 27 percent. With a very high proportion of non-white residents, minorities make up 99 percent of the total population of the study area compared to 86 percent in the Bronx, and 65 percent in New York City.

BRONX PARK SOUTH

Bronx Park South had about 5,000 residents in 2000. Approximately 44 percent of the total population are made up of people who defined themselves as Other followed by 32 percent Black and 23 percent White. More than half (69 percent) of the population in Bronx Park South are Hispanic and almost 100 percent of the population are minorities.

The median household income in Bronx Park South is approximately $17,182 per year. Compared to other neighborhoods within the study area, residents of Bronx Park South had the lowest median household income per year. However, within Bronx Park South, Census Tract 359, Block Group 1 has a higher median household income ($36,000) than the overall study area ($19,000 per year) and Bronx County ($28,000 per year), but less than New York City ($38,000 per year). In addition to having a lower median household income, 45 percent of the population in Bronx Park South are below the poverty level.

BRONX RIVER

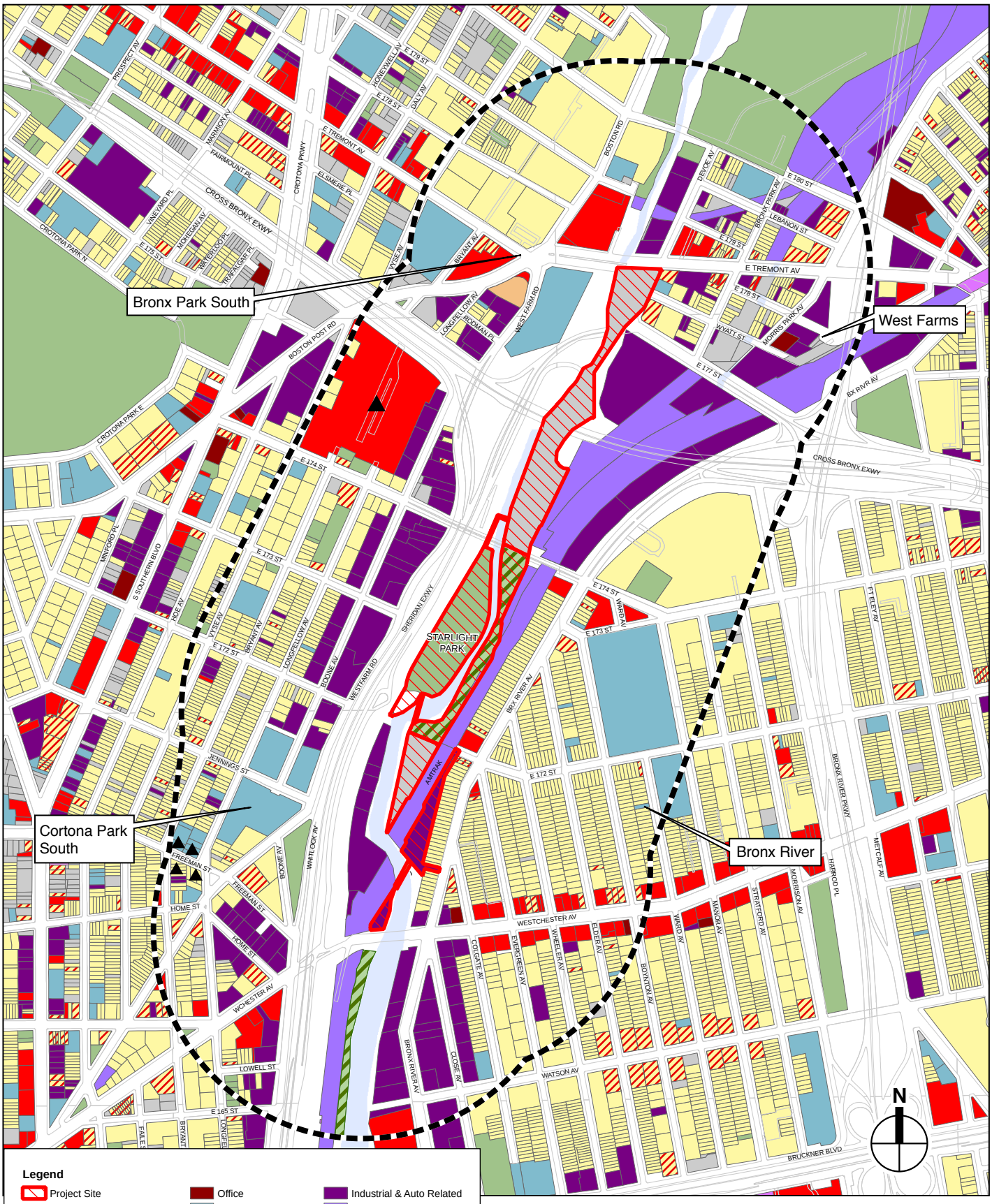
The most populated of the neighborhoods, Bronx River had roughly 11,000 people in 2000 made up of Black (37 percent), Other (35 percent), White (25 percent) and Asian (2.3 percent). Although Hispanics are the majority of the total population with 59 percent, Bronx River has the lowest representation of Hispanics compared to the other neighborhoods. Approximately 99 percent of the total population in the Bronx River neighborhood are minorities.

Residents of Bronx River have the second lowest median household income, in the study area ($17,262 per year). Census Tract 56, Block Group 2 has the lowest median household income ($10,000 per year) compared to any other census tract in the study area , and is lower than Bronx County ($28,000 per year) and New York City ($38,000 per year). Approximately 39 percent of the total population was living in poverty in 2000, which is similar to the overall study area (40 percent) but less than Bronx County (31 percent) and New York City (21 percent).

CROTONA PARK SOUTH

Crotona Park South had about 8,000 residents in 2000. The racial make-up of the neighborhood reflects that of the overall study area with Other making up the majority (40 percent) followed by Black (39 percent), White (21 percent) and Asian making up less than 1 percent. Similar to the other neighborhoods, Hispanics are the majority with 67 percent of the total population and minority residents comprising 99 percent of the total population.

11.1.06



Environmental Justice

Figure D-5-1

BRONX RIVER GREENWAY

Table D-5-1
Ethnicity and Income Characteristics of the Study Area

		Race and Ethnicity (Percent)						Economic Profile	
Area	**Population**	**White**	**African-American**	**Asian**	**Other**	**Hispanic***	**Total Minority**	**1999 Median Household Income****	**Percent Below Poverty Level*****
Bronx Park South									
CT 359, BG 1	728	22.9	17.2	1.9	58.0	79.7	99.7	$35,822	22.0
CT 361, BG 2	1,366	18.3	39.2	0.0	42.5	64.1	99.5	$13,688	59.9
CT 361, BG 4	208	26.0	28.4	4.8	40.9	56.7	99.5	$16,875	58.5
CT 361, BG 5	2,821	24.7	33.3	0.7	41.3	69.0	99.7	$14,213	43.0
Total	**5,123**	**22.8**	**32.4**	**0.9**	**44.0**	**68.7**	**99.6**	**$17,182**	**44.8**
Bronx River									
CT 52, BG 1	1,754	31.8	29.5	1.5	37.2	65.8	98.9	$13,144	44.8
CT 54, BG 2	2,561	28.4	33.3	2.9	35.5	60.4	98.8	$22,045	38.9
CT 54, BG 3	824	31.7	26.7	11.5	30.1	58.4	97.7	$21,652	32.9
CT 56, BG 1	1,808	24.1	29.0	2.7	44.2	63.0	98.0	$22,718	32.9
CT 56, BG 2	902	26.9	31.7	1.1	40.2	65.9	97.3	$10,370	44.3
CT 62, BG 1	3,462	18.4	51.6	0.1	29.8	52.1	98.9	$15,024	39.2
Total	**11,311**	**25.3**	**37.0**	**2.3**	**35.4**	**59.4**	**98.5**	**$17,262**	**38.8**
Crotona Park South									
CT 121.01, BG 1	169	24.9	56.8	0.0	18.3	45.6	98.8	$34,000	5.7
CT 121.01, BG 2	1,060	27.2	28.9	0.7	43.3	77.5	99.0	$17,417	59.0
CT 121.01, BG 4	598	26.9	34.1	1.8	37.1	67.2	99.2	$21,042	51.8
CT 121.02, BG 1	468	16.7	46.8	0.0	36.5	65.6	100.0	$13,889	53.0
CT 123, BG 1	1,356	23.4	22.6	0.0	54.1	82.4	99.3	$20,903	31.4
CT 123, BG 2	606	24.6	25.6	0.2	49.7	77.4	98.5	$23,185	45.2
CT 157, BG 1	138	23.2	40.6	0.0	36.2	65.2	100.0	$18,571	38.5
CT 157, BG 2	212	16.5	59.4	0.5	23.6	48.6	100.0	$18,462	34.6
CT 157, BG 3	1,087	17.9	35.5	0.9	45.6	65.2	98.9	$26,875	25.5
CT 157, BG 4	1,065	18.1	44.9	0.8	36.2	59.1	98.4	$19,922	41.8
CT 161, BG 1	255	23.1	58.8	0.0	18.0	47.1	100.0	$29,632	21.9
CT 161, BG 2	1,037	10.6	60.4	0.4	28.6	49.4	99.3	$19,946	31.5
Total	8,051	20.6	38.6	0.5	40.3	66.6	99.1	**$21,353**	**38.9**
West Farms									
CT 60, BG 1	1,081	32.3	16.2	0.5	51.1	81.4	97.0	$30,242	17.1
CT 220, BG 1	1,445	26.3	23.1	3.3	47.3	75.4	98.3	$11,190	53.3
Total	2,526	28.9	20.2	2.1	48.9	78.0	97.7	**$19,237**	**37.5**
¼ Mile Study Area	**27,011**	**23.8**	**35.0**	**1.5**	**39.7**	**65.0**	**98.8**	**$18,591**	**39.9**
Bronx County	**1,332,650**	**29.9**	**35.6**	**3.0**	**31.5**	**48.4**	**85.5**	**$27,611**	**30.7**
New York City	**8,008,278**	**44.7**	**26.6**	**9.8**	**18.9**	**27.0**	**65.0**	**$38,293**	**20.8**

Notes:

* An ethnic group that can include members of any racial categories.

** The median household income reported for the study area is the weighted average of those reported for the block groups.

*** Percent of persons with incomes below the established poverty level; poverty level varies depending on household size.

Populations for the 0.4 km (0.25-mile) radius at the project site was estimated by tallying all block groups that fall 50 percent or more within the study area and adjusting where appropriate to account for land use patterns.

Sources: U.S. Department of Commerce, Bureau of the Census, 2000 Census, Summary File1 & 3.

The median household income in Crotona Park South ranged from a low of $14,000 per year (Census Tract 121.02, Block Group 4) to a high of $34,000 per year (Census Tract 121.01, Block Group 1). The median household income ($21,000 per year) was higher than the overall study area ($19,000 per year), but less than Bronx County ($28,000 per year) and New York City ($38,000 per year). Approximately 39 percent of the population is living below the poverty level, which is similar to the overall study area (40 percent) but higher than Bronx County (31 percent) and New York City (21 percent). A closer look at the block group level reveals that there are three block groups where more than 50 percent of the population is living below the poverty level.

WEST FARMS

The West Farms community is the least populated of the neighborhoods, with only 2,500 residents. It has the highest concentration of Other (49 percent) and White (29 percent) populations and the lowest number of Blacks (20 percent) compared to other neighborhoods in the study area. The Hispanic population is 78 percent of the study area's population—more than the overall study area (65 percent), Bronx County (48 percent) and New York City (27 percent). Just like the other study areas, West Farms has a minority population that comprises 98 percent of the total population.

The median household income in West Farms ($19,000 per year) is similar to the overall study area but much less than Bronx County ($28,000 per year) and New York City ($38,000 per year). Almost 38 percent of the total population in West Farms lives below the poverty level, which is the lowest in comparison to the other neighborhoods in the study area, but higher than Bronx County (31 percent) and New York City (21 percent).

In summary, minority representation in the study area exceeds the 50 percent minority threshold and the poverty level is more than the 21 percent, the entire study area is a low-income and minority community.

D. SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS

No significant adverse impacts are anticipated to result from construction and operation of the Greenway project. Some localized impacts would be experienced during the construction period, including noise, traffic congestion, and fugitive dust. However, these impacts would be temporary, and the Proposed Project would result in significant positive effects to the community, as described below.

The principal impact of the Bronx River Greenway Project on ambient noise levels will occur during the construction period. Greenway construction will cause changes in noise levels from the operation of construction equipment throughout the construction period. This is due mainly to the use of heavy construction equipment.

Construction noise is regulated by the Environmental Protection Agency (EPA) noise emission standards for construction equipment. These Federal requirements mandate that 1) certain classifications of construction equipment and motor vehicles meet specified noise emissions standards; and 2) construction material be handled and transported in such a manner as not to create unnecessary noise. The New York City noise code further limits construction activities to weekdays between 7 AM and 6 PM. These regulations will be carefully followed to the greatest extent possible. However, because it will be necessary to obtain a lane closure permit from the New York City Department of Transportation (NYCDOT) Office of Construction Mitigation

and Coordination (OCMC) (which often only grants such closures during nighttime hours) some construction activity may occur outside the regular 7AM to 6PM hours. In addition, appropriate low-noise emission level equipment will be used to the extent feasible, operational procedures implemented, and such provisions will be included in contract documents.

The most substantial noise source associated with the construction equipment will be pavement breaking operations, and the use of pile drivers. There are no effective noise mitigation measures that could be employed to reduce noise levels produced by pavement breaking operations or pile driving. However, this is a temporary construction activity and would therefore not have a significant adverse impact.

Construction easements would be required for installation of retaining walls, which may cause temporary impacts to backyards and garages of residential properties along Bronx River Avenue. However, during final design, special studies will be conducted to minimize and/or avoid impacts to the residential properties. Any damage to the properties, including garage structures, would be restored after construction of the Greenway is completed.

E. POSITIVE BENEFITS TO COMMUNITY FROM THE PROPOSED PROJECT

OPEN SPACE

As discussed in Chapter D-2 “Land Use, Community Facilities, Zoning and Public Policy”, the Proposed Project would provide residents, workers and visitors improved waterfront access to the Bronx River and transportation and recreational improvements. As it currently exists, the project site is inaccessible parkland with no amenities. Therefore, the Bronx River Greenway is expected to have a beneficial effect on the community by providing a multi-use path for walking, running, bicycling, and skating, and provide a public recreational facility for use by the surrounding neighborhood. The Greenway will offer public access to an area of the Bronx River that has long been separated physically and visually from the public. The project will also improve access to Starlight Park by providing two multi-use path bridges that link the multi-use path with Starlight Park. In addition, Starlight Park will offer recreation amenities, including a basketball court, a multi-use field that can be permitted as either a soccer field or two baseball diamonds, and a variety of play equipment.

TRAFFIC

Intersection improvements to eliminate the intersection of East Tremont Avenue and East 177th Street and consolidate traffic to East Tremont Avenue and Devoe Avenue will simplify the flow of traffic and reduce congestion.

F. CONCLUSIONS ON DISPROPORTIONATE PROJECT IMPACTS

The study area includes a minority and low-income community. As detailed above, the Proposed Project would create substantial noise impacts during construction. However because the impacts are temporary, it is not expected to have significant adverse impacts. Therefore, the impacts related to noise would not adversely affect the population of the study area or any other area, and no disproportionate impact would occur.

Furthermore, as described above, the Proposed Project would bring notable benefits to the study area's population. These include creation of open space and the reduction of traffic congestion north of the Project Site. Therefore, the Proposed Project on balance would not result in disproportionate significant adverse impacts to minority or low-income populations, and would be consistent with NYSDOT's Environmental Justice policy with respect to project impacts. ✷

A. INTRODUCTION

This chapter examines the potential effects of the Proposed Project's ambient noise levels at sensitive locations in the study area during construction and operation of the Bronx River Greenway.

B. EXISTING CONDITIONS

Currently, noise in the project area is caused primarily by trains traveling on the AMTRAK Northeast Corridor Line, the elevated Nos. 2, 5, and 6 subway lines, and vehicles traveling on the roadways in the area. Interstate highways that cross or are directly adjacent to the Project Site include I-895 (Arthur Sheridan Expressway) and I-95 (Cross Bronx Expressway). Other roads that pass through or are adjacent to the Project Site include: Bronx River Avenue, Westchester Avenue, East 174th Street, East 177th Street, Wyatt Street, and East Tremont Avenue. The intersection between the northern terminus of the Cross Bronx Expressway and East Tremont Avenue experiences traffic congestion, further contributing to noise levels in the area. The nearest residence is within 100 feet of the proposed East 172nd Street bridge and within 100 feet of the proposed intersection improvements.

C. PROBABLE IMPACTS

NO ACTION

It is assumed there will be minimal changes to the Project Site without the Proposed Project. Once the remediation of Starlight Park is completed, the remaining portions of the park can be developed.

PROPOSED PROJECT

OPERATION

The NYSDOT *Environmental Procedures Manual* requires a Type I noise analysis for any proposed Federal or Federal Local Aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through lanes. The Bronx Greenway Project does not include any of the work defined in the criteria for a noise analysis. Therefore no noise analysis is required for this project.

When completed, the Bronx River Greenway will not generate additional traffic volumes of motorized vehicles that would result in substantially higher noise levels. Intersection improvements to eliminate the intersection of East Tremont Avenue and East 177th Street and consolidate traffic to East Tremont Avenue and Devoe Avenue will simplify the flow of traffic

and reduce congestion. It is anticipated that the Greenway will be used as a non-motorized transportation corridor with the potential to reduce local trips by vehicles and traffic noise. In addition, the project would not relocate the roadway closer to sensitive noise receptors, such as residences or schools. Therefore, operation of the Proposed Project will not be expected to significantly increase noise levels.

CONSTRUCTION

The principal impact of the Bronx River Greenway on ambient noise levels will occur during the construction period. Greenway construction will cause changes in noise levels from the operation of construction equipment throughout the construction period. This is due mainly to the use of heavy construction equipment.

Construction noise is regulated by the Environmental Protection Agency (EPA) noise emission standards for construction equipment. These Federal requirements mandate that 1) certain classifications of construction equipment and motor vehicles meet specified noise emissions standards; and 2) construction material be handled and transported in such a manner as not to create unnecessary noise. The New York City noise code further limits construction activities to weekdays between 7 AM and 6 PM. These regulations will be carefully followed to the greatest extent possible. However, because it will be necessary to obtain a lane closure permit from the New York City Department of Transportation (NYCDOT) Office of Construction Mitigation and Coordination (OCMC) (which often only grants such closures during nighttime hours) some construction activity may occur outside the regular 7AM to 6PM hours. In addition, appropriate low-noise emission level equipment will be used to the extent feasible, operational procedures implemented, and such provisions will be included in contract documents.

Increased noise levels caused by construction activities can be expected to be most substantial during the early phases of reconstruction. The level of impact of these noise sources depends on the noise characteristics of the equipment and activities involved, the construction schedule, and the location of potentially sensitive noise receptors. Noise and vibration levels at a given location are dependent on the kind and number of pieces of construction equipment being operated, as well as the distance from the construction site. Typical noise levels of construction equipment expected to be employed during the construction process are presented in Table D-6-1. Noise levels caused by construction activities would vary widely, depending on the phase of construction—demolition, excavations, erection of structures, etc.—and the specific task being undertaken.

The most substantial noise source associated with the construction equipment will be pavement breaking operations, and the use of pile drivers. Although there are no effective noise mitigation measures that could be employed to reduce noise levels produced by pavement breaking operations or pile driving the use of low noise emission equipment would be specified whenever possible and feasible instead of higher emission equipment (e.g., vibratory pile drivers instead of impact pile drivers).

Table D-6-1
Typical Noise Emission Levels for Construction Equipment

Equipment	Noise level at 50 feet (dBA)	Equipment	Noise level at 50 feet (dBA)
Air compressor	81	Dump truck	88
Asphalt spreader (paver)	89	Front end loader	84
Asphalt truck	88	Gas-driven vibrio-compactor	76
Backhoe	85	Hoist	76
Bulldozer	87	Jack hammer (paving breaker)	88
Compactor	80	Line drill	98
Concrete plant	83[1]	Motor crane	93
Concrete spreader	89	Pile driver/extractor	101
Concrete mixer	85	Pump	76
Concrete vibrator	76	Roller	80
Crane (derrick)	76	Shovel	82
Delivery truck	88	Truck	88
Diamond saw	90[2]	Vibratory pile driver/extractor	89[3]
Dredge	88		

Notes:

1 Wood, E.W. and A.R. Thompson, Sound Level Survey, Concrete Batch Plant; Limerick Generating Station, Bolt Beranek and Newman Inc., Report 2825, Cambridge, MA, May 1974.

2 New York State Department of Environmental Conservation, *Construction Noise Survey, Report No. NC-P2*, Albany, NY, April 1974.

3 F.B. Foster Company, Foster *Vibro Driver/Extractors, Electric Series Brochure*, W-925-10-75-5M.

Source:

Patterson, W.N., R.A. Ely, and S.M. Swanson, *Regulation of Construction Activity Noise*, Bolt Beranek and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974, except for notated items.

✷

A. INTRODUCTION

This section assesses in detail the potential air quality impacts from the intersection modifications/improvements at the northern portion of the site. The Proposed Project involves intersection modifications at East Tremont Avenue/Devoe Avenue/East 177th Street. The existing intersection is separated by an island into a northbound only roadway (Devoe Avenue) and a two-way roadway (East 177th Street). To improve intersection capacity and level of service (LOS), the project will consolidate the two intersection points condensing East 177th Street and Devoe Avenue into a multi-lane section with left turn lanes and a center-planter pedestrian refuge island parallel to Devoe Avenue's alignment. The I-895 (Arthur Sheridan Expressway)/East 177th Street intersection will also be improved as a result of the Devoe Avenue/East 177th Street/East Tremont Avenue reconfiguration.

Due to the re-alignment of the roadway and the addition of turning lanes, there would be an increase in the number of queued lanes at this intersection. Therefore, based on the procedures outlined in NYSDOT's Environmental Procedures Manual (EPM), a carbon monoxide (CO) microscale analysis has been performed to determine if the Proposed Project would cause any potential air quality impacts.

B. REGULATORY SETTING

The Clean Air Act Amendments of 1990 (CAAA90) define nonattainment areas as geographic regions that have been designated as not meeting one or more of the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standards (NAAQS). The Proposed Project is located in New York City. EPA has re-designated New York City as in attainment for CO. The CAAA90 requires that a maintenance plan ensure continued compliance with the CO NAAQS for former non-attainment Areas. New York City is also committed to implementing site-specific control measures throughout the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period.

Manhattan has been designated as a moderate NAA for PM_{10}. On December 17, 2004, EPA took final action designating the five boroughs of New York City as well as Nassau, Suffolk, Rockland, Westchester and Orange counties as $PM_{2.5}$ non-attainment areas under the CAA. State and local governments are required, by early 2008, to develop implementation plans designed to meet the standards.

Nassau, Rockland, Suffolk, Westchester and the five counties of New York City had been designated as severe non-attainment for ozone 1-hour standard. In November 1998, New York State submitted its Phase II Alternative Attainment Demonstration for Ozone, which was finalized and approved by EPA effective March 6, 2002, addressing attainment of the one-hour ozone NAAQS by 2007. New York State has recently submitted revisions to the SIP; these SIP revisions included additional emission reductions that EPA requested to demonstrate attainment

of the standard, and an update of the SIP estimates using two new EPA models—the mobile source emissions model MOBILE6, and the non-road emissions model NONROAD—which have been updated to reflect current knowledge of engine emissions, and the latest mobile and non-road engine emissions regulations. On April 15, 2004, EPA designated these same counties as moderate non-attainment for the new 8-hour ozone standard which became effective as of June 15, 2004 (the entire Orange county was moved to the Poughkeepsie moderate non-attainment area for 8-hour ozone). EPA revoked the 1-hour standard on June 15, 2005; however, the specific control measures for the 1-hour standard included in the SIP are required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. A new SIP for ozone will be adopted by the state no later than June 15, 2007, with a target attainment deadline of June 15, 2010.

A State Implementation Plan (SIP) is a state's plan on how it will meet the NAAQS under the deadlines established by the CAAA90. While the specific details of the SIP are up to the states to determine, there is usually a component that will reduce emissions from mobile sources. The conformity requirements of the CAAA90 and the regulations promulgated thereunder also prohibit the federal government from engaging in, supporting, financing, licensing, permitting, or approving any activity that does not conform to a SIP's purpose. EPA's final transportation conformity rule, dated August 15, 1997, requires metropolitan planning organizations (MPOs), the Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) to make conformity determinations on metropolitan long-range transportation plans (LRTPs), transportation improvement programs (TIPs), and projects before they are adopted, approved, or accepted. Conformity determinations for FTA projects must be made according to the requirements of 40 CFR Part 93.

The LRTP is the official intermodal metropolitan transportation plan for an area that is developed through the metropolitan planning process for the urbanized area, and generally has a 20-year planning horizon. The TIP is a staged, multiyear, intermodal program of transportation projects developed by an MPO, which is consistent with the LRTP. TIPs are generally for three to five years. A project must come from a conforming plan and TIP; there must be a currently conforming plan and TIP in place at the time of NEPA process completion; and, the project-level conformity requirements must also be satisfied. In addition, highway projects that are funded or approved by the FHWA must be found to conform. Conformity to a SIP is defined as conformity to a plan's purpose of eliminating or reducing the severity and number or violations of the NAAQS and achieving expeditious attainment of the standards.

Accordingly, an area's MPO, which is the entity responsible for transportation planning, together with the state, are responsible for demonstrating conformity with respect to the SIP on metropolitan LRTPs and TIPs. The EPA must then concur with such conformity determinations. The U.S. Department of Transportation has final approval of conforming plans and TIPs.

The New York Metropolitan Transportation Council (NYMTC) is the MPO for this region. NYMTC approved the conformity determination for the LRTP, known as the Regional Transportation Plan entitled "Mobility for the Millennium," on September 23, 1999. FHWA and FTA then approved the LRTP conformity determination on September 30, 1999, and EPA concurred with the findings. The 2004-2006 TIP was approved by NYMTC on September 30, 2003. A proposed regional transportation plan (RTP), Transportation Improvement Program (TIP) and emission analysis were submitted to the public for review and comment (pursuant to 40 CFR Section 93.105) on March 29, 2005.

At this time, as a result of the World Trade Center disaster on September 11, 2001, and the loss of NYMTC's files containing regional transportation and air quality data, combined with the damage incurred on the downtown mass transit system, the conformity requirements for the New York metropolitan area have been temporarily waived until September 30, 2005, pursuant to Public Law 107-230; Stat. 1469, enacted October 1, 2002. (This means that the MPO has until September 30, 2005, to produce a conforming TIP and Plan.) Interim interagency consultation procedures were developed, to be in effect during the waiver. These procedures were developed to assist New York State in the interim reporting to congressional committees, the EPA, and the U.S. Department of Transportation.

Design, right-of-way, and portions of the construction elements of the Bronx River Greenway Project were included in the approved TIP. Other portions of the Proposed Project, including advanced portions of the construction plan, were scheduled for review as part of the next TIP update. For purposes of transportation conformity, the Bronx River Greenway project is exempt from the regional emissions analysis requirements of 40 CFR Part 93.

C. CO MICROSCALE AIR QUALITY ANALYSIS

A preliminary analysis for the proposed mid-block crossing at the middle site (Westchester Avenue/Edgewater Road) was performed using the Highway Capacity Software (HCS) 2000 to determine the operating conditions with the new traffic signal in place. Based on this analysis, the east- and westbound approaches of Westchester Avenue would operate at an acceptable level-of-service (LOS) B with delays of under 20 seconds, with adequate time available for the bicyclists and pedestrians to cross Westchester Avenue. Therefore, based on the preliminary assessment of traffic conditions at the new signalized crossing, along with the fact that no new vehicular trips would be generated by the proposed improvements, a detailed mobile source Air Quality analysis is not warranted at this location.

While the bike and pedestrian path will ultimately extend south to Soundview Park, the Proposed Project terminates at Westchester Avenue/Edgewater Road. Therefore, an analysis south of the Project Site has not been performed as part of this EA.

The CO microscale air quality analysis is based on the procedures outlined in the EPM. Since the project is situated in a maintenance area for CO, the analysis will be required for Estimated Time of Completion, ETC (2006) and a critical analysis year, which is that year of ETC+10 (2016) or ETC+20 (2026) that results in the highest emissions. Analysis was performed for a 2006 ETC, although the project schedule now has an ETC of 2009. It is not expected that the change in design year would produce significantly different results. A comparison between year 2006 and year 2009 traffic volumes and emission factors was conducted. As shown in Table D-7-2, Year 2006 has the greater CO emission source strength than 2009.

CARBON MONOXIDE NAAQS

The National Ambient Air Quality Standards (NAAQS) for CO are a one-hour average concentration of 35 ppm which cannot be exceeded more than once per year and an eight-hour average concentration of 9 ppm which cannot be exceeded more than once per year. The results of the air quality analysis were compared with these one-hour and eight-hour NAAQS.

EXISTING AIR QUALITY CONDITIONS

Due to the improvement of vehicle emissions and other traffic control measures, CO concentrations have been reduced in recent years. NYSDEC air quality monitoring data indicate that the second highest one-hour and eight-hour average CO concentrations are 3.7 ppm and 2.1 ppm, respectively, in 2002 at the Bronx Botanical Garden monitoring site, which is the closest NYSDEC monitor to the Proposed Project.

MODELS USED IN THE AIR QUALITY ANALYSIS

Vehicle emission factors are from the Carbon Monoxide Emission Factor Table EF1 (dated December, 2003) in Attachment 1.1-E of the EPM, which is calculated with MOBILE6 using the most up-to-date input parameters for the study area. These emission factors were used as input for the microscale Level I screening dispersion model CAL3QHC version 2 (abbreviated as CAL3QHC). The CAL3QHC model simulates worst-case carbon monoxide levels by employing conservative assumptions on wind speeds and directions, and is used as a screening tool to determine if there would be future predicted exceedances of the carbon monoxide one- and eight-hour NAAQS. In cases where there are predicted exceedances, the refined model, CAL3QHCR, may then be employed at the location with the predicted exceedance. The refinements included in CAL3QHCR include the capability to use actual meteorological data that has been collected at nearby airports (instead of worst case assumptions of wind speed and direction), and also the capability to account for lower traffic volumes during off-peak conditions in the one- and eight-hour average simulations.

EMISSION FACTORS

NYSDOT supplied project traffic volumes were employed with the corresponding CO emission factors in order to estimate the total emission source strengths. Vehicle classifications were supplied by NYSDOT, based on field surveys. The analysis was performed for ETC and the critical analysis year of ETC+10 or ETC+20, which is the year that is found to have the greatest total CO emission source strength.

Emission factors are from the Carbon Monoxide Emission Factor Table EF1 in the Attachment 1.1-E of the EPM. The table was generated using an ambient temperature of 43°F. Details of parameters can be found in the table. The emission factors were determined for each link at their respective speed. The average free flow speed used for all roadways was 15 mph, based on field survey data. Emission factors for urban arterial vehicle classes at 15 mph and idle conditions for the years ETC (2006), ETC+10 (2016) and ETC+20 (2026) were based on the speed, vehicle mix, and thermal state. These emission factors are shown in Table D-7-1.

These CO emission factors were used in the CAL3QHC modeling.

Table D-7-1
CO Emission Factors

Speed	Year 2006	Year 2016	Year 2026
Urban Arterial			
15 mph[1]	8.91	4.90	4.02
Idle[2]	80.16	42.83	35.12

Notes:
[1] units are grams/vehicle-mile
[2] units are grams/vehicle-hour

CRITICAL ANALYSIS YEAR

Emission factors for the critical year analysis are based on the free flow speed. Based on the traffic data provided, a speed of 15 mph was used for all links. Future year traffic volumes for years 2006 and 2016 were computed from year 2001 traffic volumes, using an annual growth rate of 0.5 percent. Using these vehicle speeds and the total traffic volumes at the intersection for the years 2006, 2016 and 2026, a corridor emission analysis was performed to determine the critical analysis year. Emission factors, traffic volumes, and total emission strength for the three years are provided below. Since the project is situated in a maintenance area for CO, the analysis was required for ETC (2006), and the critical analysis year, which is that year of ETC+10 (2016) or ETC+20 (2026) that results in the highest emissions. As shown in Table D-7-2, the critical analysis year for the air quality analysis was determined to be the year 2016. The emission factors in Table D-7-2 reflect the June 2004 update to EFI. Year 2009 emission factors and traffic volumes are included in this table for comparison purposes only.

Table D-7-2
Corridor Emissions Analysis

Year	Emission Factor (g/veh-mi)*	2-Way Design Hour Traffic Volume (vph)	Total Emission Strength (g/mi-hr)
East Tremont Avenue (urban arterial)			
2006	8.10	1,994	16,145
2009	5.82	2,024	11,781
2016	4.25	2,093	8,893
2026	3.67	2,193	8,051
Devoe Avenue (urban arterial)			
2006	8.10	1,040	8,426
2009	5.82	1,056	6,148
2016	4.25	1,092	4,641
2026	3.67	1,144	4,202
Totals			
2006	NA	3,034	24,571
2009	NA	3,080	17,929
2016	NA	3,186	13,533
2026	NA	3,337	12,253

Note: NA - Not Applicable
* June 2004 update to Table EFI.

CO BACKGROUND CONCENTRATIONS - ROLLBACK ANALYSIS

Based on the recommendations in the EPM, a "rollback" analysis was performed to determine the future background CO levels for the analysis year 2016. Estimated 2006 future background CO levels listed in Table 9, Chapter 1.1 in the EPM for Region 11 are 3.3 and 2.3 parts per million (ppm) for the one- and eight-hour averages, respectively. Using 2006 and 2016 traffic volumes (calculated using an assumed growth factor of 0.5 percent from the base year 2001), the following formula was used to determine the CO background concentrations for the year 2016:

$$C_{2016} = C_{2006} * \left(0.2 + \frac{EF_{2016} * V_{2016}}{EF_{2006} * V_{2006}} * 0.8\right), \qquad (1)$$

where C_{2006} and C_{2016} are the year 2006 and 2016 background concentrations (can be either eight-hour or one-hour background), EF_{2006} and EF_{2016} are the emission factors for 2006 and 2016. The emission factors for 2006 equal 8.91 g/veh-mi. The emission factors for 2016 equal 4.90 g/veh-mi. V_{2006} and V_{2016} represent the total PM peak hour vehicles for future conditions, and were estimated at 3,034 and 3,186 vph respectively. Based on these parameters, the background concentrations for year 2016 were calculated to be 2.2 and 1.5 ppm for the one-hour and eight-hour averages, respectively.

DISPERSION MODELING

The CAL3QHC model was employed in this study for the Level I microscale air quality analysis at the site.

PERSISTENCE FACTOR

A persistence factor of 0.70 was used to convert one-hour average concentrations to eight-hour concentrations due to dispersion (without background) for the Level I screening model, CAL3QHC.

WIND SPEED

A 1 m/s wind speed was used in the CAL3QHC dispersion model.

SURFACE ROUGHNESS HEIGHTS

Based on the land uses near the analysis sites, a surface roughness height of 175 cm was used in the CAL3QHC analysis.

ATMOSPHERIC STABILITY

An urban atmospheric stability classification (D) was used in the CAL3QHC modeling.

WIND DIRECTIONS

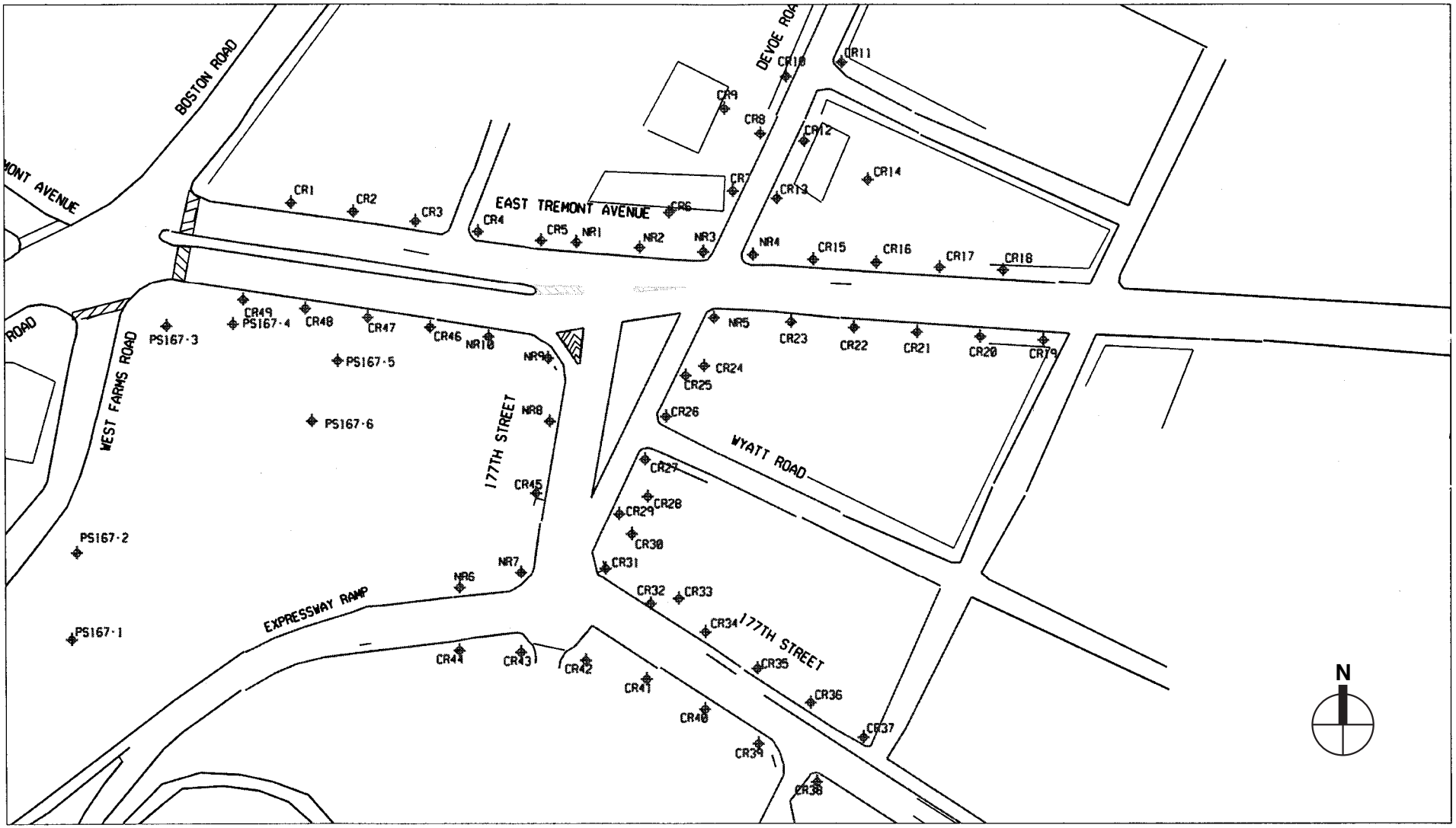
The CAL3QHC model calculations were performed at 5° increments from 0° to 360° for all receptor locations in the 2006 No Build, 2006 Build, 2016 No Build, and 2016 Build analyses.

RECEPTOR LOCATIONS

Receptors are used in the model to determine the impact of roadway traffic within the project area (Figures D-7-1 and D-7-2). The receptors are placed at locations that are accessible to the public. Receptors were placed near the corners of the intersections, and along the roadways at intervals of 25 m from the corner receptors. Additional receptors were placed at property lines and buildings near the intersections including six receptors at the school at the corner of East Tremont Avenue and West Farms Road (P.S. 167). Receptors were placed in locations both common to the No Build and Build Alternatives and in locations unique to each alternative.

PEAK HOUR TRAFFIC VOLUMES

The PM peak hour traffic volumes for the 2006 and 2016 No Build and Build Alternatives were employed in the CAL3QHC analyses.

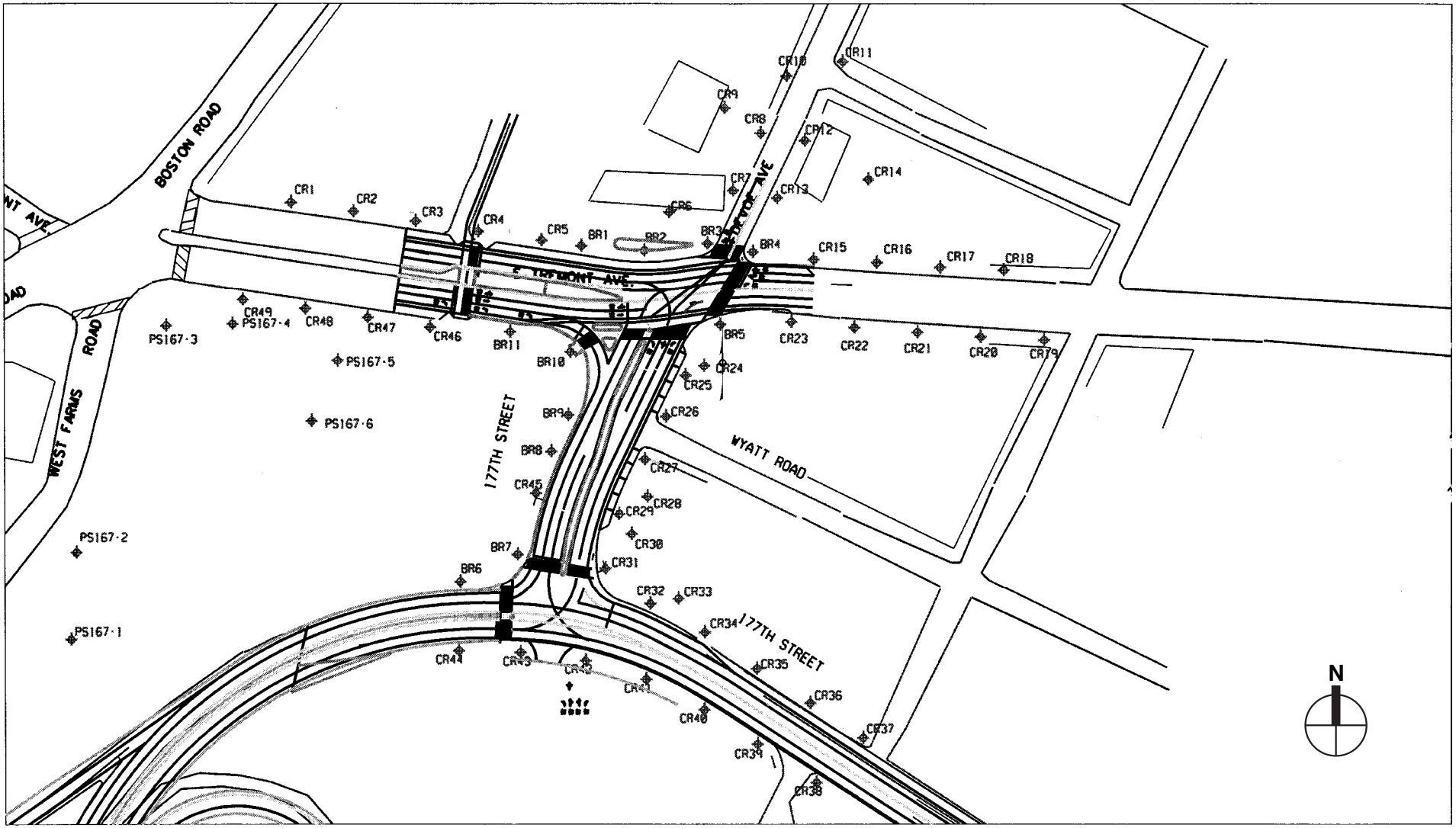


NR *No Build Receptors*

CR *Common Receptors (No Build and Build)*

PS167 *P.S. 167 School Receptors*

Figure D-7-1
Bronx River Greenway CO Analysis
No Build Receptors



BR *Build Receptors*

CR *Common Receptors (No Build and Build)*

PS167 *P.S. 167 School Receptors*

Figure D-7-2
Bronx River Greenway CO Analysis
Build Receptors

MODEL RESULT ANALYSIS

The CAL3QHC input and output files for the years 2006 and 2016 are presented in the attachment. The results from the model represent one-hour average concentrations due to the nearby modeled traffic only. To determine the total one-hour average concentration at each receptor, the one-hour background value was added to the dispersion modeling results. For the eight-hour average concentration at each receptor, the one-hour dispersion component from the model was multiplied by the persistence factor of 0.70, the result of which was then added to the corresponding eight-hour background value.

CAL3QHC (LEVEL I) MODELING RESULTS

Table D-7-3 shows the maximum predicted one-hour and eight-hour average CO concentrations at all the receptor locations at the intersection of East Tremont Avenue/Devoe Avenue/177th Street, for the 2006 and 2016 No Build Alternative from the Level I (CAL3QHC) modeling. Under the 2006 No Build Alternative, the maximum one-hour and eight-hour concentrations are 7.1 ppm and 5.0 ppm, respectively, at receptor 29. Under the 2016 No Build Alternative, the maximum one-hour and eight-hour concentrations are 4.2 ppm and 2.9 ppm, respectively, at receptor 29. Table D-7-4 shows the maximum predicted one-hour and eight-hour average CO concentrations at all the receptor locations at the intersection of East Tremont Avenue/Devoe Avenue/177th Street, for the 2006 and 2016 Build Alternative from the Level I (CAL3QHC) modeling. Under the 2006 Build Alternative, the maximum one-hour and eight-hour concentrations are 6.1 ppm and 4.3 ppm, respectively, at receptor 31. Under the 2016 Build Alternative, the maximum one-hour and eight-hour concentrations are 4.2 ppm and 2.9 ppm, respectively, at receptor 30.

CONCLUSIONS OF DISPERSION MODELING RESULTS

The maximum one-hour and eight-hour average concentrations that are comparable to the air quality standards for the year 2006 and 2016 No Build and Build Alternatives are in compliance with the one-hour CO NAAQS of 35 ppm and the eight-hour CO NAAQS of 9 ppm, and therefore, the Proposed Project would not result in any adverse air quality impacts. No further study is required.

D. LEAD EMISSIONS

Emissions of lead from motor vehicles have decreased significantly as a result of lead being phased out as an additive in motor vehicle fuels. The FHWA has advised that microscale lead analyses for highway projects is not needed or warranted. Lead emissions from highways have been virtually eliminated as a result of the regulation and legislation prohibiting the manufacture, sale, or introduction into commerce of any engine requiring leaded gasoline since model year 1992, sale of only unleaded gasoline, and the requirement for reformulated gasoline to contain no heavy metals (such as lead).

E. PARTICULATE MATTER (PM)

The Proposed Project has been classified as a Categorical Exclusion as listed in FHWA's regulatory definition provided as 23 CFR 771.117 (c) and (d), and determined to be a Non-Type II SEQRA EA Action as defined and listed in the NYSDOT SEQRA regulations provided as 17 NYCRR Part 15, but has been determined to result in no increased traffic volumes. The Proposed Project's actions do not individually or cumulatively have a significant effect on PM

emissions. It can therefore be concluded that the project will have no significant adverse impact on ambient PM levels.

Table D-7-3
One-Hour and Eight-Hour Average CO Concentrations (ppm) for the No Build Alternative, CAL3QHC Modeling (Level I)

Receptor	CO (ppm) - 2006 No Build			CO (ppm) - 2016 No Build		
	1-hour	8-hour	Wind Dir.	1-hour	8-hour	Wind Dir.
Site 1: East Tremont Ave/Devoe Ave/177th St						
R1	5.5	3.8	115	3.3	2.3	105
R2	5.9	4.1	150	3.5	2.4	160
R3	6.2	4.3	215	3.7	2.6	210
R4	5.8	4.1	230	3.4	2.4	240
R5	5.9	4.1	290	3.7	2.6	300
R6	4.8	3.4	240	3.1	2.2	230
R7	5.2	3.6	35	3.1	2.2	115
R8	5.0	3.5	165	3.0	2.1	150
R9	5.0	3.5	65	3.0	2.1	320
R10	5.0	3.5	65	3.1	2.2	75
R11	4.9	3.4	115	3.1	2.2	225
R12	4.9	3.4	120	3.1	2.2	125
R13	5.0	3.5	135	3.2	2.2	125
R14	5.2	3.6	120	3.2	2.2	125
R15	5.3	3.7	110	3.3	2.3	180
R16	5.1	3.6	190	2.9	2.0	195
R17	4.7	3.3	165	2.8	1.9	130
R18	4.3	3.0	190	2.5	1.7	200
R19	4.1	2.9	210	2.5	1.7	185
R20	4.1	2.9	195	2.5	1.7	210
R21	4.0	2.8	210	2.4	1.7	215
R22	4.2	2.9	215	2.6	1.8	215
R23	4.7	3.3	220	2.8	1.9	225
R24	4.2	2.9	220	2.6	1.8	235
R25	5.2	3.6	255	3.1	2.2	255
R26	4.8	3.4	230	3.0	2.1	120
R27	4.9	3.4	125	3.2	2.2	105
R28	4.8	3.4	145	3.1	2.2	110
R29	7.1	5.0	280	4.2	2.9	290
R30	6.3	4.4	70	4.0	2.8	80
R31	6.1	4.3	75	3.7	2.6	85
R32	5.6	3.9	80	3.6	2.5	295
R33	5.7	4.0	285	3.5	2.4	295
R34	4.7	3.3	290	2.9	2	295
R35	4.8	3.4	345	2.9	2	300
R36	4.7	3.3	230	2.8	1.9	0
R37	4.5	3.1	230	2.8	1.9	5
R38	4.4	3.1	240	2.7	1.9	255

Table D-7-3 (cont'd)
One-Hour and Eight-Hour Average CO Concentrations (ppm)
for the No Build Alternative, CAL3QHC Modeling (Level I)

Receptor	CO (ppm) - 2006 No Build			CO (ppm) - 2016 No Build		
	1-hour	8-hour	Wind Dir.	1-hour	8-hour	Wind Dir.
Site 1: East Tremont Ave/Devoe Ave/177th St						
R39	4.7	3.3	235	2.8	1.9	240
R40	4.4	3.1	245	2.7	1.9	250
R41	4.6	3.2	245	3.0	2.1	245
R42	4.9	3.4	255	3.0	2.1	135
R43	4.3	3.0	250	2.7	1.9	140
R44	4.5	3.1	135	2.9	2.0	235
R45	4.7	3.3	135	3.0	2.1	130
R46	4.7	3.3	130	3.1	2.2	135
R47	4.7	3.3	130	3.1	2.2	135
R48	4.2	2.9	315	2.7	1.9	0
R49	4.2	2.9	95	2.7	1.9	0
R50	4.2	2.9	100	2.7	1.9	105
R51	4.2	2.9	110	2.7	1.9	105
R52	4.2	2.9	0	2.8	1.9	290
R53	4.4	3.1	5	2.9	2.0	10
R54	5.1	3.6	30	3.1	2.2	35
R55	5.3	3.7	140	3.2	2.2	125
R56	5.0	3.5	75	3.2	2.2	70
R57	4.8	3.4	80	3.0	2.1	75
R58	4.5	3.1	80	2.8	1.9	85
R59	4.5	3.1	85	2.8	1.9	70
PS167-1	3.8	2.7	140	2.5	1.7	130
PS167-2	3.7	2.6	110	2.5	1.7	140
PS167-3	4.0	2.8	15	2.6	1.8	45
PS167-4	4.1	2.9	75	2.7	1.9	0
PS167-5	4.3	3.0	75	2.7	1.9	70
PS167-6	3.8	2.7	50	2.4	1.7	0

Table D-7-4
One-Hour and Eight-Hour Average CO Concentrations (ppm)
for the Build Alternative , CAL3QHC Modeling (Level I)

Receptor	CO (ppm) – 2006 Build			CO (ppm) – 2016 Build		
	1-hour	8-hour	Wind Dir.	1-hour	8-hour	Wind Dir.
Site 1: East Tremont Ave/Devoe Ave/177th St						
R1	5.2	3.6	180	3.1	2.2	245
R2	5.2	3.6	190	3.2	2.2	260
R3	5.1	3.6	215	3.1	2.2	105
R4	5.2	3.6	230	3.1	2.2	110
R5	5.0	3.5	60	3.1	2.2	45
R6	5.1	3.6	235	3.2	2.2	235
R7	5.0	3.5	50	3.1	2.2	45
R8	5.1	3.6	165	3.0	2.1	140
R9	5.0	3.5	60	3.1	2.2	65
R10	5.1	3.6	80	3.0	2.1	50
R11	5.0	3.5	70	3.3	2.3	75
R12	5.0	3.5	245	3.1	2.2	225
R13	4.8	3.4	120	3.0	2.1	120
R14	4.8	3.4	120	3.1	2.2	120
R15	5.0	3.5	165	3.2	2.2	125
R16	5.2	3.6	210	3.2	2.2	250
R17	4.6	3.2	195	2.9	2.0	110
R18	4.6	3.2	160	2.9	2.0	125
R19	4.1	2.9	150	2.5	1.7	230
R20	4.1	2.9	215	2.4	1.7	115
R21	4.0	2.8	155	2.4	1.7	210
R22	3.9	2.7	210	2.5	1.7	240
R23	4.2	2.9	230	2.6	1.8	235
R24	4.4	3.1	215	2.9	2.0	240
R25	4.2	2.9	195	2.6	1.8	180
R26	5.7	4.0	230	3.2	2.2	115
R27	5.6	3.9	245	3.3	2.3	255
R28	5.4	3.8	255	3.2	2.2	105
R29	5.2	3.6	250	3.2	2.2	260
R30	5.0	3.5	280	4.2	2.9	280
R31	6.1	4.3	295	3.9	2.7	80
R32	5.8	4.1	75	3.7	2.6	80
R33	5.6	3.9	80	3.4	2.4	75
R34	5.5	3.8	75	3.3	2.3	65
R35	4.8	3.4	290	2.9	2.0	285
R36	5.1	3.6	305	3.0	2.1	300
R37	5.0	3.5	295	3.0	2.1	320
R38	4.7	3.3	235	2.9	2.0	325

Table D-7-4 (cont'd)
One-Hour and Eight-Hour Average CO Concentrations (ppm)
for the Build Alternative , CAL3QHC Modeling (Level I)

Receptor	CO (ppm) – 2006 Build			CO (ppm) – 2016 Build		
	1-hour	8-hour	Wind Dir.	1-hour	8-hour	Wind Dir.
Site 1: East Tremont Ave/Devoe Ave/177th St						
R39	4.5	3.1	240	2.9	2.0	240
R40	5.0	3.5	245	3.1	2.2	250
R41	4.5	3.1	245	2.9	2.0	255
R42	4.6	3.2	240	2.8	1.9	240
R43	4.8	3.4	255	3.1	2.2	145
R44	4.6	3.2	255	2.8	1.9	225
R45	5.4	3.8	265	3.2	2.2	265
R46	5.5	3.8	285	3.4	2.4	280
R47	4.5	3.1	280	2.7	1.9	265
R48	4.4	3.1	280	2.8	1.9	250
R49	4.2	2.9	320	2.8	1.9	330
R50	4.6	3.2	315	2.7	1.9	0
R51	4.7	3.3	330	2.8	1.9	320
R52	4.7	3.3	340	3.0	2.1	350
R53	4.6	3.2	280	2.8	1.9	0
R54	4.8	3.4	290	3.0	2.1	290
R55	5.1	3.6	30	3.2	2.2	25
R56	4.8	3.4	140	3.1	2.2	125
R57	5.7	4.0	75	3.6	2.5	80
R58	4.6	3.2	90	2.9	2.0	75
R59	4.4	3.1	90	2.8	1.9	80
R60	4.6	3.2	80	2.8	1.9	85
PS167-1	5.1	3.6	90	3.2	2.2	85
PS167-2	3.8	2.7	130	2.6	1.8	140
PS167-3	4.2	2.9	80	2.6	1.8	45
PS167-4	4.2	2.9	80	2.7	1.9	0
PS167-5	4.2	2.9	60	2.7	1.9	65
PS167-6	3.9	2.7	165	2.4	1.7	0

F. CONSTRUCTION

Airborne particles will be controlled through wetting of soil surfaces, covering of trucks and other dust sources. These requirements will be included as part of the specifications of the construction contract. This project would not have any significant traffic diversions or detours.

G. SUMMARY

The air quality analysis has followed the proper procedures listed in the EPM. CO microscale air quality analysis indicated the proposed intersection improvements would not cause any potential exceedances of the CO NAAQS. Therefore, the project would not have a significant adverse air quality impact. It complies with the requirement of CAAA90 and the final rule on transportation conformity. As the project is a NEPA Categorical Exclusion and SEQR Non-Type II Action, the Proposed Project would have no significant adverse effect on ambient PM levels. ✷

A. INTRODUCTION

This chapter addresses the Proposed Project's potential effects on natural resources. The chapter provides descriptions of natural resources within the Project Site; assesses the future conditions without the Proposed Project; and assesses the project's potential impacts to natural resources during both construction and operation. Measures to reduce potential effects to natural resources are also discussed. Attachment D-A1 summarizes the federal, state, and local regulations that apply to activities that affect natural resources.

B. EXISTING CONDITIONS

The Project Site covers approximately 10 hectares (HA) (25 acres) along a one-mile stretch of the lower Bronx River. There are approximately 1.35 HA (3.33 acres) of impermeable surface, primarily associated with two auto-related operations. The remaining acreage is vegetated. Vegetated areas include riparian vegetation (trees and brush) on both banks with successional woodlands on the east side extending from the river to the AMTRAK railroad tracks, or other developed land uses. A segment of the multi-use path may pass through Starlight Park, an approximately 3.6 HA (8.9- acre) park located between East 172nd and 174th Streets on the western shore, if cleanup activities are complete when construction activities are initiated for the Proposed Project. Starlight Park is currently denuded as a result of on-going hazardous materials remediation due to historic uses of the property.

UPLAND RESOURCES

Tree cover is more extensive on the east shoreline of the river. Tree species observed within the Project Site include American elm (*Ulmus americana*), black birch (*Betula lenta*), black locust (*Robinia pseudoacacia*), black cherry (*Prunus serotina*), boxelder (*Acer negundo*), weeping willow (*Salix babylonica*), and Norway maple (*Acer platanoides*). Shrub and herb species include multiflora rose (*Rosa multiflora*), Japanese knotweed (*Polygonum cuspidatum*), deer tongue (*Panicum clandestinum*), and mugwort (*Artemisia vulgaris*.).

A patch of successional old field is located within the Project Site immediately southwest of the MTA bus depot, covering the majority of the project area west of the dirt path, continuing under the overpass for East 174th Street. A successional old field is a meadow dominated by forbs (herbaceous plants other than grasses) and grasses that occurs on sites that have been cleared and then abandoned. The herbaceous groundcover in this community type within the project area includes Japanese knotweed (*Polygonum cuspidatum*), mugwort (*Artemisia vulgaris*), curly dock (*Rumex crispus*), fall panicum (*Panicum dichotomiflorum*), common goldenrod (*Solidago juncea*), common reed (*Phragmites australis*), and Timothy grass (*Phleum pratense*). Shrubs include staghorn sumac (*Rhus typhina*), raspberry (*Rubus* spp.), and multiflora rose (*Rosa multiflora*). Another patch, dominated by common reed and interspersed with staghorn sumac, is

located just south of the area where the ramp will be graded up to the proposed pedestrian bridge that will pass over the railroad tracks at East 172nd Street.

WETLANDS

The New York State Department of Environmental Conservation (NYSDEC) and U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) identify wetlands within the Project Site (Figures D-8-1 and D-8-2). No freshwater wetlands are mapped within the Project Site. The NYSDEC tidal wetland map, prepared from infrared aerial photographs taken in 1974, identifies the entire stretch of the Bronx River below East Tremont Avenue as littoral zone [tidal waters with depths below 1.8 m (6 feet)]. Depths at the Project Site are generally below 1.8 m (6 feet) at low tide. The NWI map was prepared by stereoscopic analysis of high altitude aerial photographs taken in 1980 and classifies the river as riverine, permanent tidal, open water (R1OWV) wetlands from approximately East Tremont Avenue to a point between East 174th and East 172nd Streets. A weir crosses the river just above East 172nd Street. Proceeding south, the river is classified as estuarine, subtidal, open water (E1OWL) wetlands. No other tidal wetlands are identified on the NWI map in the project area.

A field survey of tidal wetlands in the northern portion of the Project Site was conducted on March 9, 2001. The entire shoreline on both sides of the river from East Tremont Avenue to East 172nd Street was characterized by a functional armor stone riprap. South of East 172nd Street (below the weir) to the railroad track crossing, the eastern shoreline was characterized as a combination of natural rock shoreline, and riprap. Intertidal mudflats were observed in the river along both shores, although these are not indicated on either the NWI or NYSDEC wetland maps. Wetland vegetation observed along the east bank of the river south of Starlight Park included purple loosestrife (*Lythrum salicaria*), yellow flag iris (*Iris pseudacorus*), tidalmarsh amaranth (*Amaranthus cannabinus*), fall panic grass (*Panicum dichotomiflorum*), and common reed. This assemblage reflects the variability in salinity and tides within the Project Site. Two of the plant species (purple loosestrife and yellow flag iris) are generally found in freshwater systems, while the remaining three are primarily associated with estuarine systems. Both of the freshwater species are non-native of European origin. Of the three estuarine species, fall panic grass is indigenous but considered invasive in the northeast, and common reed may be indigenous but is considered a noxious weed. Non-native and/or invasive species such as Japanese knotweed, a non-native noxious weed, and common reed were concentrated on the riprap and banks.

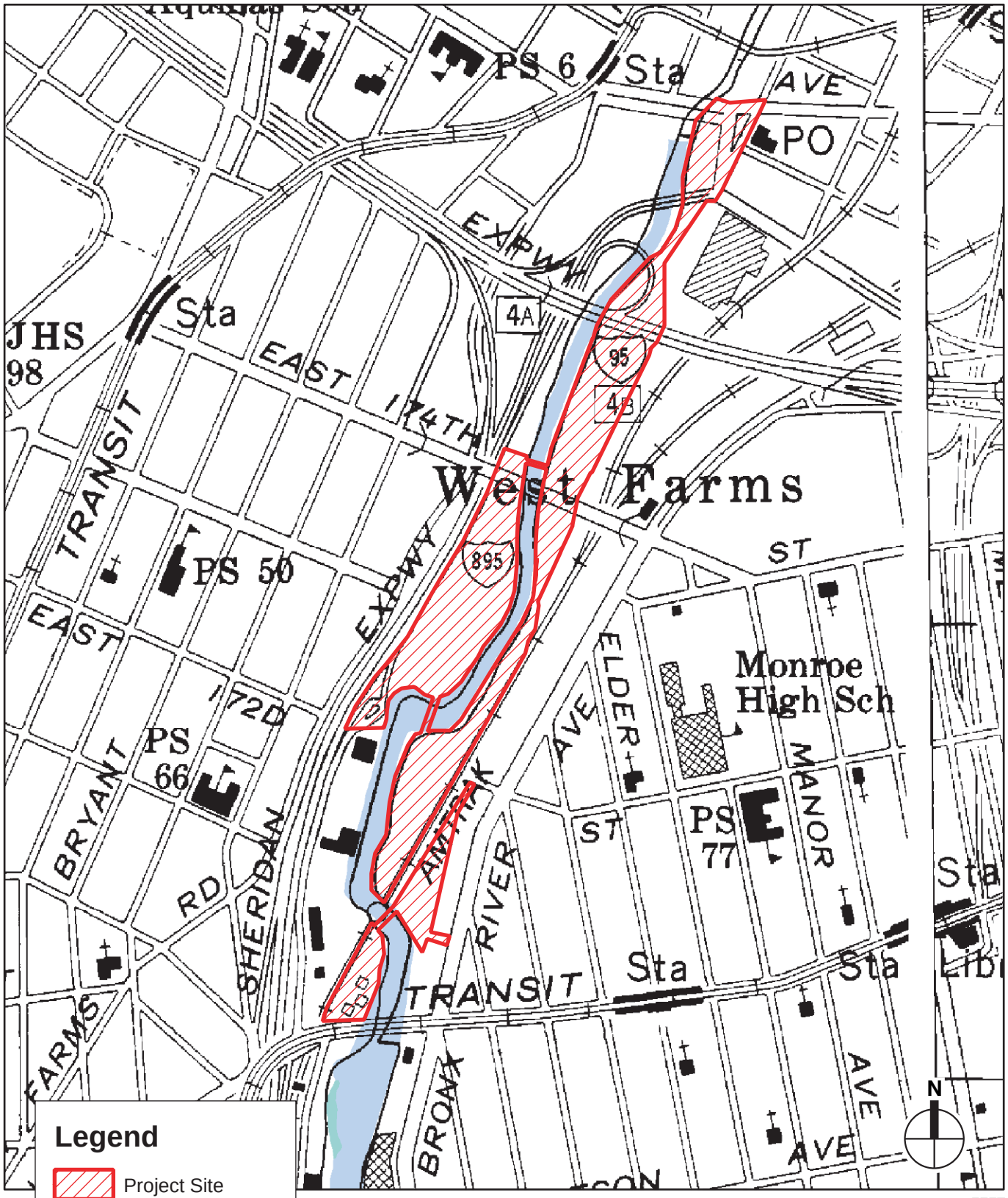
A field survey of tidal wetlands in the area between the AMTRAK Bridge and East 172nd Street was conducted in December 2000. Dominant plant species in the wetland area included American elm, black birch, and smooth cordgrass (*Spartina alterniflora*).

EXECUTIVE ORDER 11990 WETLANDS FINDING

A Wetlands Finding per Executive Order 11990, has been prepared as part of the project, and is included in Attachment D-A4 to the EA. It is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

AVIFAUNA AND MAMMALS

Wading birds that have been observed along the shorelines of the lower Bronx River include snowy egrets (*Egretta thula*), great egrets (*Ardea alba*), great blue herons (*Ardea herodias*),



Legend

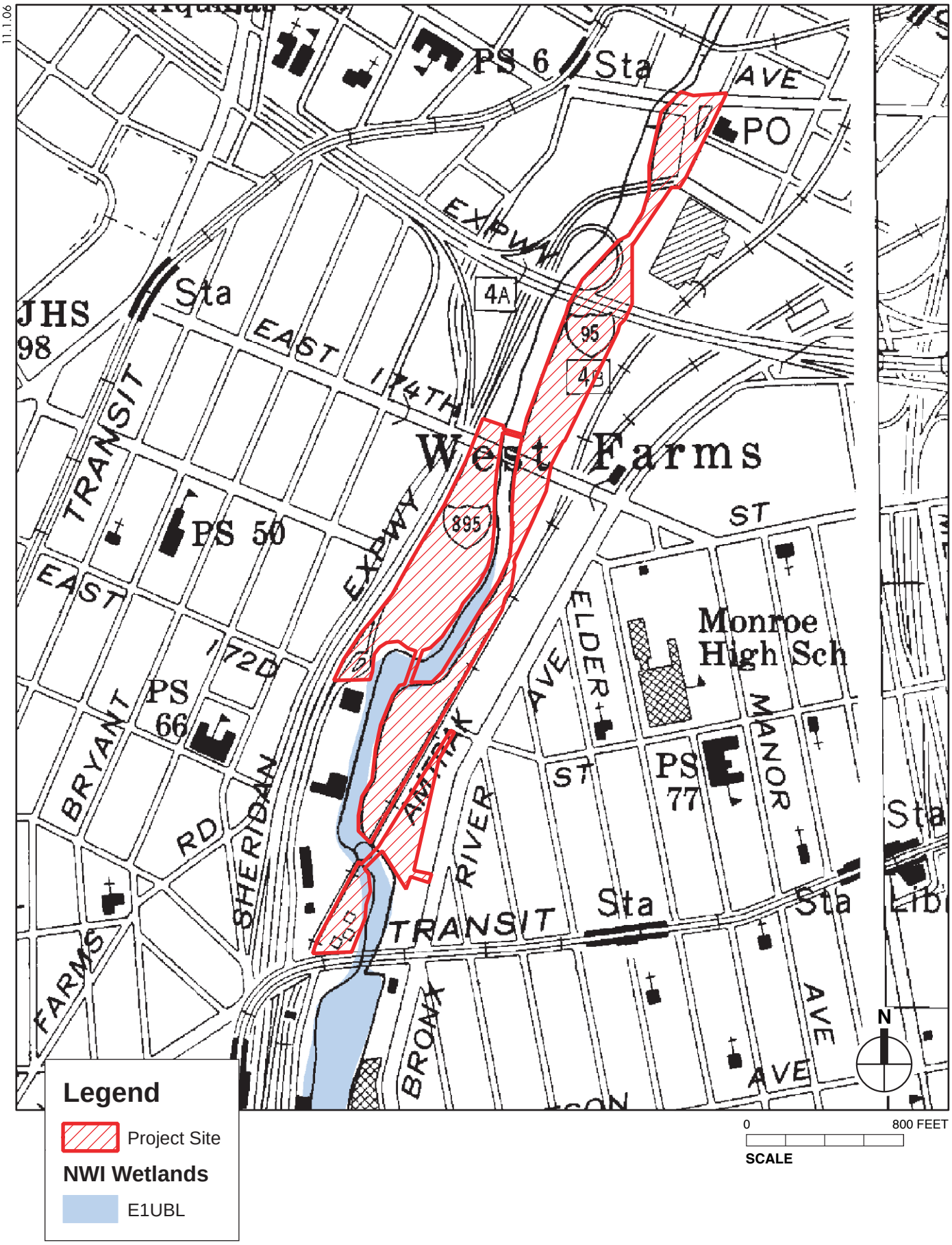
- Project Site

DEC Tidal Wetlands

- Littoral Zone
- Salt Marsh

DEC Wetlands

Figure D-8-1



NWI Wetlands Central Park Quad

Figure D-8-2

black-crowned night-heron (*Nycticorax nycticorax*), and glossy ibis (*Plegadis falcinellis*) (Rachlin 2002, 2004). Wading birds are more common south of the Project Site near Soundview Park where there are large mudflats (Rachlin Pers Comm. 2004). Mallards (*Anas platyrhynchus*) and Canada geese (*Branta canadensis*) were observed on the water at the Project Site during the site visit in March 2004. Other waterbirds that may use the lower Bronx River include various shorebirds (e.g., plovers and sandpipers), cormorants (*Phalacrocorax auritus*), swans (*Cygnus* sp.), swallows, belted kingfishers (*Ceryle alcyon*), and a variety of gulls (Rachlin 2002).

The New York State Breeding Bird Atlas Project, conducted by the New York State Department of Environmental Conservation (NYSDEC), is an ongoing project to document the presence of avian breeders throughout New York State. The first Atlas was completed in 1988 based on data collected from 1980 through 1985 (Andrle and Carroll 1988). Avian surveys are currently being conducted for the second Atlas, and the results for years 2000 through 2003 have been tabulated and are available. The Project Site is located in the southeast corner of block 5852D. Other green spaces in this block include a large portion of Bronx Park, Crotona Park, Claremont Park, and a portion of Inwood Hill Park. The New York State Breeding Bird Atlas reported 58 species of birds as confirmed, possible, or probable breeders between 2000 and 2003 (Table D-8-1). In general, the bird species listed in Table D-8-1 are associated with open woodlands or forest habitat. The open woodlands present within the Project Site are not wide enough to provide habitat for forest interior-dwelling birds.

Vegetation on the Project Site may also be used by bird species passing through the area during migratory periods in the spring and autumn. Small mammals such as squirrels, mice, chipmunks, raccoons, opossums, and feral cats may also use the wooded and shrubby areas of the Project Site.

AQUATIC RESOURCES

MACROINVERTEBRATES

Macroinvertebrates known to occur in the lower Bronx River include crabs (horseshoe crab (*Limulus polyphemus*), blue crab (*Callinectes sapidus*), green crab (*Carcinus*), Pacific grapsid shore crab (*Hemigrapsus*), hermit crab (*Pagarus*), and fiddler crab (*Uca* sp.), shrimp (sand shrimp (*Crangon*), grass shrimp (*Palaemonetes*), mantis (*Squilla empusa*), sponges (*Microciona* sp.), anemones (*Haliplanella* sp.), comb jellies (*Mnemiopsis* sp.), limpets (*Acmaea* sp.), periwinkles (*Littorina* sp.), mussels (*Mytilus* and *Modiolis* sp.), oysters (*Crassostrea* sp.), clams (*Spisula* and *Mya* sp.), and sand worms (*Nereis* sp.) (Rachlin 2004).

FISH

Recent surveys indicate the lower Bronx River serves as a breeding ground and nursery to estuarine and anadromous fish such as striped bass (*Morone saxatilis*), Atlantic menhaden (*Brevoortia tyrannus*), bluefish (*Pomatomus saltatrix*), gizzard shad (*Dorosoma cepedianum*), Atlantic silversides (*Menidia menidia*), and winter flounder (*Pseudopleuronectes americanus*). Naked goby (*Gobiosoma bosci*) and seaboard goby (*Gobiosoma ginsburgi*) were recorded in the lower Bronx River in surveys conducted during the summer of 2002 (Rachlin 2002).

Table D-8-1

NYSDEC 2000-2003 Breeding Bird Atlas Results for Block 5852D

Common Name	Scientific Name
Confirmed Breeders	
Green Heron	*Butorides virescens*
Canada Goose	*Branta canadensis*
Mute Swan	*Cygnus olor*
Wood Duck	*Aix sponsa*
Mallard	*Anas platyrhynchos*
Cooper's Hawk	*Accipiter cooperii*
Red-tailed Hawk	*Buteo jamaicensis*
American Kestrel	*Falco sparverius*
Ring-necked Pheasant	*Phasianus colchicus*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Great Horned Owl	*Bubo virginianus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Eastern Phoebe	*Sayornis phoebe*
Eastern Kingbird	*Tyrannus tyrannus*
Warbling Vireo	*Vireo gilvus*
Red-eyed Vireo	*Vireo olivaceus*
American Crow	*Corvus brachyrhynchos*
Fish Crow	*Corvus ossifragus*
Tree Swallow	*Tachycineta bicolor*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Black-capped Chickadee	*Poecile atricapillus*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
European Starling	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Yellow Warbler	*Dendroica petechia*
Chipping Sparrow	*Spizella passerina*
Song Sparrow	*Melospiza melodia*
Northern Cardinal	*Cardinalis cardinalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Common Grackle	*Quiscalus quiscula*
Brown-headed Cowbird	*Molothrus ater*
Baltimore Oriole	*Icterus galbula*
American Goldfinch	*Carduelis tristis*
House Sparrow	*Passer domesticus*

Table D-8-1 (cont'd)
NYSDEC 2000-2003 Breeding Bird Atlas Results for Block 5852D

Common Name	Scientific Name
Probable Breeders	
Black-crowned Night-Heron	*Nycticorax nycticorax*
Chimney Swift	*Chaetura pelagica*
Red-bellied Woodpecker	*Melanerpes carolinus*
Northern Flicker	*Colaptes auratus*
Eastern Wood-Pewee	*Contopus virens*
Great Crested Flycatcher	*Myiarchus crinitus*
Blue Jay	*Cyanocitta cristata*
Barn Swallow	*Hirundo rustica*
Tufted Titmouse	*Baeolophus bicolor*
Wood Thrush	*Hylocichla mustelina*
Pine Warbler	*Dendroica pinus*
Common Yellowthroat	*Geothlypis trichas*
House Finch	*Carpodacus mexicanus*
Possible Breeders	
Spotted Sandpiper	*Actitis macularia*
Monk Parakeet	*Myiopsitta monachus*
Eastern Screech-Owl	*Megascops asio*
White-breasted Nuthatch	*Sitta carolinensis*
Orchard Oriole	*Icterus spurius*
Sources: http://www.dec.state.ny.us/website/dfwmr/wildlife/bba/index.html	

Fish species collected within the Project Site using a push net around East Tremont Avenue and to the north included estuarine species such as mummichog (*Fundulus heteroclitus*), and fourspine stickleback (*Apeltes quadracus*), freshwater species such as tessellated darter (*Etheostoma olmstedi*), blacknose dace (*Rhinichthys atratulus*), and white sucker (*Catostomus commersoni*), and a catadromous species (living in freshwater and migrating to salt water to spawn), the American eel (*Anguilla rostrata*) (Rachlin 2004). Salinity within the Project Site above the weir is generally low, measuring 0-2.5 ppt around East Tremont Avenue (Rachlin Pers. Comm. 2004). This may limit the presence of some estuarine and marine species that prefer higher salinity waters.

ESSENTIAL FISH HABITAT (EFH)

Attachment D-A2, "Essential Fish Habitat Assessment," provides a detailed discussion of EFH designations for the lower Bronx River in the vicinity of the Project Site, and potential impacts to these designations from the construction and operation of the Proposed Project. The location of the Bronx River Greenway on the lower Bronx River is within a portion of the Hudson River estuary EFH that is situated in the 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 square includes the following waters: Atlantic Ocean waters within the square within the Hudson River Estuary affecting the following: Manhattan Island, New York City, College Pt., NY, Long Island City, NY, Brooklyn, NY, Port Morris, NY, Unionport, NY, Flushing Bay, Astoria, NY, LaGuardia Airport, Badland

Isl., Rikers Isl., Roosevelt Isl., Wards Isl., and Hells Gate, along with the East River, the Harlem River, and the Bronx River. This area has been identified as EFH for 17 species of fish: pollock, red hake, winter flounder, windowpane, Atlantic herring, bluefish, Atlantic butterfish, Atlantic mackerel, summer flounder, scup, black sea bass, king mackerel, Spanish mackerel, cobia, sand tiger shark, dusky shark, and sandbar shark. Marine species that would not be expected to occur within the Project Site include: Spanish mackerel, king mackerel, cobia, sand tiger shark, dusky shark, and sandbar shark.

THREATENED AND ENDANGERED SPECIES AND HABITATS OF SPECIAL CONCERN

No threatened or endangered species or habitats of special concern under the responsibility of the USFWS are known to occur within the Project Site (Clough 2004), The New York State Department of Environmental Conservation New York Natural Heritage Program (NYNHP) identified 11 NY State recognized threatened or endangered plant species (see Table D-8-2) that were historically observed on the grounds of the Bronx Park, which is located approximately 1,000 feet to the north-northeast of the Project Site. None of these species is listed as threatened or endangered under the Federal Endangered Species Act of 1973. All of the recorded observations of these species are historical, dating from the late 1800s to 1962. Table D-8-2 lists the 11 threatened or endangered plant species reported for the Bronx Park, their state legal status, their Global and State Rank, date last seen within Bronx Park, and habitat preferences.

Table D-8-2

Historical Records of NY State Recognized Threatened or Endangered Plant Species Identified as Occurring in Bronx Park To the North of the Project Site

Species	NY Legal Status,	Global and State Status and Date Last Seen	General Habitat
Yellow giant-hyssop *Agastache nepetoides*	Threatened	G5, S2S3 Confirmed for Bronx County, Historical Record 1901-09-26	occurs in moist, open woodland areas on rich soils and calcareous bedrock , thickets, woodland borders, and disturbed areas such as along railroad tracks, fencerows, floodplains, and disturbed woodlands. Present June-November, Flowers July-September, Fruits September-November.
Woodland agrimony (Beaked agrimony) *Agrimonia rostellata*	Threatened	G5, S2, Probable for Bronx County, Historical Record 1899-09-01	in New York region usually occurs in non-wetlands but may occasionally be found in wetland areas; in the Sterling Forest (in the Hudson Highlands) this species was found on oak-hickory slopes; generally a woodland species. Flowers July-September, Fruits October.
Willdenow's sedge *Carex willdenowii*	Threatened	G5, S3, Probable for Bronx County, Historical Record 1897-06-13	moist to dry deciduous forest, mostly acidic soils, can occur in association with hemlocks. Flowers May-July, Fruits August.
Rattlebox *Crotolaria sagittalis*	Endangered	G5, S1, Probable for Bronx County, Historical Record, 1896-08-19	prairies, glades, open wooded slopes, sand or rocky open ground, fields, railroads. Flowers July-September, Fruits October-November.

Table D-8-2 (cont'd)

Historical Records of NY State Recognized Threatened or Endangered Plant Species Identified as Occurring in Bronx Park To the North of the Project Site

Species	NY Legal Status	Global and State Status and Date Last Seen	General Habitat
Slender crabgrass *Digitaria filiformis*	Threatened	G5, S2, Probable for Bronx County, Historical Record, 1896-09-03	in full sun in sterile sandy soils; can be found in successional and disturbed areas. Flowers August, Fruits August-September.
Slender spikerush *Eleocharis tenuis* var *pseudoptera*	Endangered	G5T5, S1, Confirmed for Bronx County, Historical Record, 1897-05-27	in the New York region usually occurs in wetlands; found in bogs and along streambanks. Flowers July-August, Fruits September.
Carolina cranesbill (Carolina geranium) *Geranium carolinanium*	Threatened	G5T4, S2, Probable for Bronx County, Historical Record, 1947-06-18	usually found in open and wooded areas that receive partial sunlight; often found along roadsides or other areas of mild disturbance; in some northeast states it is considered an invasive weed
Rough avens (Pale avens) *Geum virginianum*	Endangered	G5, S2, Probable for Bronx County, Historical Record, 1896-06-27	upland, dry forests; also dry-mesic forests with black, white, and red oak, bramble and hickory species, gray dogwood. Flowers June-September.
Velvet panic grass (Velvet panicum) *Panicum scoparium* (*Dichanthelium oligosanthos var scribnerianum*)	Endangered	G5, S1, Confirmed for Bronx County, Historical Record, 1953-07-23	in New York region generally occurs in wetlands; usually in wooded areas, but also in wooded-open edge situations; usually found in moist or boggy areas (along streams creeks, in swales, etc.). Flowers June, Fruits July-October.
Tall flat panic grass (Red top panicum) *Panicum stipitatum* (*Panicum rigidulum var. elongatum*)	Endangered	G4G5, SH, Probable for Bronx County, Historical Record, 1906-09-20	in New York region usually occurs in wetlands; wet meadows and prairies, damp woods, in roadside ditches, along streams, around ponds and lakes. Flowers July, Fruits August-September.
Field beadgrass (Field paspalum) *Paspalum laeve*	Endangered	G4G5, S1, Confirmed for Bronx County, Historical Record, 1962-06-25	in New York region can occur in wetland or non-wetland habitats; moist depressions, swamps, ponds, lakes, sloughs, pastures, streambanks, cultivated areas, old fields, ditches, disturbed sites, roadsides, railroads; considered a troublesome weed species in New Jersey. Fruits August-October.

Notes: G4=Apparently secure throughout its range (but possibly rare in parts**,** G5=Demonstrably secure throughout its range (but possibly rare in parts), S1=Critically imperiled in New York State because of extreme rarity (5 or fewer sites or very few remaining individuals, or extremely vulnerable to extirpation from NY State due to biological factors, S2=Imperiled in NY State because of rarity (6-20 sites or few remaining individuals) of highly vulnerable to extirpation from NY State due to biological factors, S3=Rare in New York State (usually 21-35 extant sites), SH =historical, no existing sites known in New York State in the last 20 years but it may be rediscovered, species are listed as given in the NYNHP report, changes in species scientific names are indicated in parentheses as indicated in Young, S and T.W. Weldy. 2004. New York Natural Heritage Program Rare Plant Status List. New York Natural Heritage Program, New York State Department of Environmental Conservation.

The NYNHP was contacted to confirm whether any of the 11 NY State-recognized threatened or endangered plant species reported as historically occurring in the Bronx Park is likely to occur within the Project Site. Of the 11 threatened and endangered species, two species were deemed the only plants having the potential to occur onsite by NYNHP endangered plant specialists, including rattlebox and field beadgrass. A Threatened and Endangered Species Survey was performed in July and August 2005. After a thorough investigation of areas of potential occurrence, neither rattlebox nor field beadgrass were found on the Project Site.

INVASIVE SPECIES

On February 2, 1999, President Clinton issued Executive Order 13112, "Invasive Species." This Executive Order is designed to prevent introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

NYSDOT has conducted a preliminary site inventory of the Project Site due to the presence of Japanese knotweed, a New York State Priority Plant also listed on the federal invasive species list. In response to concerns about this plant in the Bronx River corridor, NYSDOT has implemented a stand-alone invasive species control project. It is expected that the plans will be completed by the spring of 2005 and control measures will be implemented over the course of the next three growing seasons. Upon completion of this phase of control, any remaining plants will be inventoried and controlled as part of the Greenway contract. Future control post-Greenway construction will be the responsibility of NYCDPR, as they will be responsible for long term management of the site.

C. PROBABLE IMPACTS

NO ACTION

It is assumed there will be minimal changes to the Project Site without the Proposed Project. Once the cleanup of Starlight Park is completed, the remaining portions of the park can be developed. The New York City Department of Parks and Recreation (NYCDPR) Natural Resources Group has sponsored stream rehabilitation projects all along the lower Bronx River in recent years and has plans to continue this work in the near future (Larson 2004). The projects include shoreline naturalization, wetland planting, and removal of debris, and will contribute to improved water quality and aquatic habitat in the lower river. The ongoing water quality improvements occurring throughout the New York Harbor Estuary should continue to result in some enhancement of habitat for aquatic biota. Furthermore, the development of some green space should lead to some habitat enhancements for birds and other terrestrial species.

PROPOSED PROJECT

CONSTRUCTION

Project elements that have the potential to affect natural resources include:

- Upland construction activities such as construction of the multi-use path, four pedestrian bridges (three over water, one upland), removal of impermeable surfaces, Starlight Park, the amphitheater and concessions area, retaining walls, and the boathouse; and

- In-water activities such as dredging for construction of the floating dock (if required), driving of piles for construction of the floating dock, construction of the fixed platform, removal of bulkheads and other engineered shorelines and regrading during shoreline naturalization, and construction of the combined sewer overflow (CSO) outfall extension.

The project design will retain as many of the native trees that are already on the Project Site where practicable, and will include removal of invasive vegetation (primarily Japanese knotweed) under the direction of New York State Department of Transportation (NYSDOT), where possible. Removal of nonnative invasive species within the one mile stretch of the river including the Project Site is anticipated to begin in spring 2004 and continue through the construction period. Only registered herbicides will be used as part of these control efforts, and only those herbicides registered for use near surface waters will be applied near the river. Use of herbicides will follow all safety precautions to prevent drift and runoff to the river to minimize potential effects to non-target plants and wildlife. Erosion control measures and temporary seeding will meet the requirements of the NYCDPR, NYCDEP, and NYSDEC.

As discussed above, of the 11 threatened and endangered species, two species were deemed the only plants having the potential to occur onsite by NYNHP endangered plant specialists, including rattlebox and field beadgrass. A Threatened and Endangered Species Survey was performed in July and August 2005. After a thorough investigation of areas of potential occurrence, neither rattlebox nor field beadgrass were found on the Project Site.

The proposed improvements to the traffic intersections, and bridges, the amphitheater and concessions area, retaining walls, and multi-use path will be constructed in uplands and will not be expected to impact wetlands. Extension or removal of the CSO during a future project by NYCDEP will, in either case, extend the east bank into the Bronx River by 9 m (30 feet). This will impact 0.016 HA (0.04 acres) of littoral zone wetland. NYSDOT will mitigate for the loss of littoral zone through the creation of wetlands within the Project Site (most likely high marsh). The type of wetland creation will be determined during the design phase of the Proposed Project. Wetland restoration activities, including invasive species removal and native species planting, will also improve the quality of wetlands within the Project Site.

Approximately 120 cubic meters (157 cubic yards) of material in mudflat and/or littoral zone wetlands will have to be dredged for installation of the floating dock. Potential impacts associated with dredging include localized and temporary increases in suspended sediments and the temporary loss of benthic macroinvertebrates in the area dredged. Water quality changes associated with these increases in suspended sediment are expected to be minimal and temporary, limited to the immediate area of the activity. Suspended sediments would dissipate shortly after the dredging is completed and the piles that will support the dock are driven into place. An increase in littoral zone area and possibly loss of some small mudflat area may also occur from the construction of the floating dock.

The benthic community will be expected to reestablish within a short period of time as organisms colonize the area from adjacent areas. Estuarine species have behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment. Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates are fairly tolerant of elevated suspended sediment concentrations and have developed behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions in the field such as increases in suspended sediment and noise (Clarke and

Wilber 2000), and also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. More mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans to suspended sediments that lasted up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000) which will not occur from the limited dredging that will occur as a result of the Proposed Action. The area of dredging will be small and the period of disturbance short. Therefore activity associated with dredging for the floating dock, should it be required, will not be expected to result in significant adverse impacts to water quality or fish populations of the Bronx River.

Bulkhead and riprap will be removed, where feasible, along the New York City Marshall Impound Lot (aka PDJ Simone) and Apex Auto property shorelines [total of 244 m (802 feet)], and the shorelines graded, naturalized, and stabilized with plantings. Results of the boring program (e.g., depth to bedrock) will be used to determine how and where regrading and naturalization will be feasible. Stormwater from the Project Site will be managed to reduce direct discharges to the Bronx River. A stormwater pollution prevention plan (SWPPP) will be developed in accordance with NYSDEC's State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-02-01. There will be potential for on-site erosion and sedimentation at construction sites where soils will be disturbed (i.e., bulkhead and riprap removal, installation of landscaping, construction of retaining walls, removal of impervious surfaces, etc.). Where these activities are located adjacent to the waterway, there will be potential for localized, temporary increases in suspended sediment. The SWPPP will include erosion and sediment control measures that comply with the "New York Standards and Specifications for Erosion and Sediment Control" such as hay bales, silt fencing, vegetative covers, and slope and soil stabilization. Planting of the graded, naturalized shorelines with native vegetation will reduce the potential for erosion and sedimentation in these areas. The SWPPP will also include measures to manage stormwater following construction in accordance with the "New York State Stormwater Management Design Manual."

Areas temporarily disturbed during construction and restoration work will be restored to their original condition through proper grading, and all temporary structures and materials will be removed following construction. Designated wetland areas to be protected will be prominently marked or barricaded.

No significant adverse impacts to essential fish habitat or managed fish stocks are anticipated from construction of the Proposed Project. A detailed discussion of EFH species is included in Attachment D-A2.

OPERATION

Conversion of paved industrial properties to green space [approximately 1.35 HA (3.33 acres)] will result in an increase in the available terrestrial habitat on the site. A gently graded meadow, to be planted with native grasses and/or wildflowers, will be created in the vicinity of East 174th Street. This small meadow will provide habitat for grassland birds, butterflies and other insects, and small mammals. Starlight Park, which is currently denuded due to on-going clean-up activities, will be developed into an active recreation area with playfields, grassy areas, a boat

house, and the floating dock. Landscaping will include native tree, shrub, and herbaceous species that will have the potential to provide habitat for wildlife. Nonnative and invasive species control will also improve terrestrial habitat at the Project Site for wildlife.

The bridges considered for the three pedestrian crossings over the river are 17 feet wide with 1 foot to either side for railings. Shading of water by the three pedestrian bridges over the Bronx River will be approximately 0.08 HA (0.195 acres). The cantilevered overlooks would shade approximately 0.012 HA (0.03 acres). The floating dock and fixed platform have the potential to shade 0.22 HA (0.055 acres) of water. Shading is of concern because it can affect the habitat of some species of fish and lower productivity of primary producers. Studies of fish under very large piers [approximately 2.1 HA (5.3 acres)] indicate that shading could cause an impact on the habitat for certain fish species because of these species' dependence on sight and light for feeding (Able et al. 1999). The bridge (Bridge #1) between Westchester Avenue and the AMTRAK railroad tracks will shade approximately 0.004 (0.01 acres) of proposed high marsh on the west bank, 0.008 (0.02 acres) of littoral zone, and a small amount of mudflat on the east bank. However, the areas of the three bridges and overlooks are very small and light will still be able to penetrate from the sides of these relatively narrow structures. The proposed 5.2 m (17-foot) width is narrower than what is considered optimal for multi-use paths 6.7 m (22 feet) which reduces the potential impacts due to shading by the bridge structures. The small amount of shading resulting from the Proposed Project will not be expected to result in significant adverse impacts to aquatic biota or wetlands.

Naturalization of shorelines will help to improve stormwater retention, resulting in improved water quality, and will improve habitat for birds and mammals that use riparian and wetland habitats. The intertidal wetlands created during shoreline naturalization will provide habitat for macroinvertebrates and fish. During low tides, exposed intertidal habitat will provide feeding and resting areas for wading and shorebirds.

Recreational boats visiting the park will be limited to small personal watercraft such as kayaks and canoes. These watercraft have shallow drafts and will not disturb the river bottom. Their use in the Bronx River will not result in significant adverse impacts to aquatic biota.

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Chapter D-9: Surface Water Quality and Floodplains

A. INTRODUCTION

This chapter addresses the Proposed Project's potential effects on surface water quality and floodplains. This chapter also addresses navigation. Specifically, the analysis assesses the project's potential impacts to surface water and floodplains during both construction and operation. Appendix 1 summarizes the federal, state, and local regulations that apply to activities that affect surface water quality and floodplains.

B. EXISTING CONDITIONS

SURFACE WATER QUALITY

WATER QUALITY

The Proposed Project is located on the lower Bronx River, a tributary to the Upper East River and part of the New York Harbor Estuary. The Bronx River is tidally influenced within the Project Site. The head of the tide occurs at a dam at the southern end of Bronx Park approximately one-quarter mile north of the northern end of the Project Site (East Tremont Avenue). Freshwater flows range from approximately 5 to 10 cubic feet per second (cfs) during dry conditions and from approximately 20 to 70 cfs during wet conditions (LMS 1994). Salinity near the confluence with the East River generally ranges from approximately 15 to 32 ppt, with an average of about 25 ppt (NYCDEP 2004). Salinity recorded within the Project Site near East Tremont Avenue north of the weir located just north of East 172nd Street is much lower, between 0 and 2.5 ppt (Rachlin Pers. Comm. 2004).

The NYSDEC classifies the lower Bronx River as Use Class I. The best usages for Class I saline surface waters are as secondary contact recreation and fishing. These waters must be suitable for fish propagation and survival. The water quality of the New York Harbor Estuary and its tributaries such as the Bronx River 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. The construction and upgrading of wastewater treatment facilities (WWTF), and implementation of water pollution control programs that have occurred within the New York Harbor since the 1970s has greatly reduced nutrient inputs and improved water quality (Brosnan and O'Shea 1995). Despite these overall improvements in water quality of the Harbor, the water quality of the lower Bronx River is impaired due to pathogen concentrations and oxygen demand (NYSDEC 2002 303d list and 2004 draft 303d list).

Average fecal coliform concentrations for the Upper East River—Western Long Island Sound area, which includes the lower Bronx River, showed a dramatic decline from the 1970s, dropping from more than 2,000 cells per 100 milliliters (cells/100 mL) to around 50 cells/100

mL in recent years, below the standard for Use Class I. This decline is attributed to the construction and upgrading of WWTF, and the city's water pollution control programs (NYCDEP 2003). The closest monitoring station for the NYCDEP Harbor Survey is located near the mouth of the Bronx River. Fecal coliform measurements taken between 1999 and 2003 at the Bronx River sampling station ranged from 1 to 1,940 cells/100 mL and averaged 205 cells/100 mL in top waters, never exceeding the Class I criteria.

DO measurements taken between 1999 and 2003 at the Bronx River sampling station ranged from 3.4 to 14.3 mg/L for surface waters, and averaged 6.3 mg/L. Bottom water DO concentrations were generally slightly lower than surface water concentrations, but were usually above the 4.0 milligram per liter (mg/L) standard (NYCDEP 2004). DO has the potential to drop below the standard during periods in the summer. A similar pattern is expected for the Project Site, given the shallow water depths. DO measurements taken in the northern portion of the Project Site in March through May of 2003 ranged from 9.4 to 11.4 mg/L (Rachlin Pers. Comm. 2004). Areas with DO concentrations less than 4.0 mg/L are often avoided by finfish, although most estuarine organisms can tolerate much lower concentrations for short periods.

Other indicators of water quality recorded for the Bronx River station in the Upper East River—Western Long Island Sound area include chlorophyll *a*, water transparency, suspended sediment, and pH. The concentration of chlorophyll *a* (used to estimate phytoplankton biomass) between 1999 and 2003 ranged from 0.9 to 129 µg/L and averaged 10.6 µg/L. Water transparency, measured with a Secchi disk, between 1999 and 2003 ranged from 2 to 8 feet and averaged 4.5 feet (NYCDEP 2004). Turbidity appears to be slightly increasing in this area. Within the lower New York Harbor Estuary, surface and bottom water pH ranges from 7.0 to 8.0 throughout the year (Brosnan and O'Shea 1995).

The project corridor is not in a Sole-source-, Primary-, or Principal- aquifer area. Groundwater in Bronx County is not a source of potable water.

SEDIMENT QUALITY

Complex flow patterns lead to widely variable sediment characteristics throughout the area, varying from coarse sands and gravels in high-energy areas to fine-grained silts and clays in low-energy areas (USACOE 1999). As is typical of urban watersheds, 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, 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. Within the New York/New Jersey 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).

FLOODPLAINS

The Bronx River is designated as a regulatory floodway by NYSDEC Environmental Conservation Law. Within in the Project Site, the entire shoreline on both sides of the river is characterized by hard shoreline stabilization structures. From East Tremont Avenue to East 172nd Street the shoreline is characterized by a functional armor stone riprap. South of East 172nd Street to the railroad track crossing, the eastern shoreline is characterized by a combination of natural rock shoreline and artificial broken rock riprap. South of the railroad bridge the shoreline is characterized by a combination of sheetpile and concrete bulkhead, and riprap. Between East Tremont Avenue to approximately 300 feet south of I-95 (Cross Bronx Expressway), the 100-year floodplain is primarily limited to the banks of the Bronx River (Figure D-9-1). South of this point the 100-year floodplain varies from 0 to about 200 feet on either side of the river. The loss of most of the river's natural floodplain coupled with the large amount of impervious surfaces bordering the river have resulted in flashy surface water flows and low ground water recharge.

NAVIGABLE WATERS

Commercial boating is not important on the Bronx River because of its shallow depths and the location of a weir between East 172nd Street and East 174th Street. Commercial vessels have not used this portion of the river since the 1920s. Although formerly a lift bridge, Westchester Avenue over the Bronx River is a fixed concrete superstructure that prevents the passage large ocean-going and commercial vessels. In addition, the AMTRAK Bridge, which is a lift bridge, is no longer capable of lifting and prevents passage of large vessels. Therefore, pedestrian Bridge #1, which would have a lower clearance than Westchester Avenue and a higher clearance than the AMTRAK Bridge, would not impact the navigation of ocean-going or commercial vessels.

C. PROBABLE IMPACTS

NO ACTION

It is assumed there will be minimal changes to the Project Site without the Proposed Project. Once the cleanup of Starlight Park is completed, the ball fields and other facilities proposed for the park could be constructed. The New York City Department of Parks and Recreation (NYCDPR) Natural Resources Group has sponsored stream rehabilitation projects all along the lower Bronx River in recent years and has plans to continue this work in the near future (Larson 2004). The projects include shoreline naturalization, wetland planting, and removal of debris, and will contribute to improved water quality in the lower river. The ongoing water quality improvements that are under way throughout the New York Harbor, such as combined sewer outfall (CSO) upgrades and repairs, are expected to continue and to result in enhanced water quality in the river. The Bronx River shorelines in the area will continue to be structurally stabilized shoreline (riprap and bulkheads). Therefore, no changes to the floodplain are expected.

PROPOSED PROJECT

CONSTRUCTION

Surface Water Quality

Project elements that have the potential to affect water quality include:

11.1.06

Project Site Area

0 1000 FEET

SCALE

500-Year Flood Boundary ——— ZONE B

100-Year Flood Boundary ———

Zone Designations* ZONE A1 / ZONE A5

100-Year Flood Boundary ———

500-Year Flood Boundary ——— ZONE B

Base Flood Elevation Line With Elevation In Feet** 513

Base Flood Elevation in Feet Where Uniform Within Zone** (EL 987)

Elevation Reference Mark ERM 7 ▲

C Areas of minimal flooding. (No shading)

Zone D Boundary ———

River Mile •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

Flood Insurance Rate Map

Figure D-9-1

BRONX RIVER GREENWAY

- In-water activities such as dredging for construction of the floating dock (if required), driving of piles for construction of the floating dock, construction of the fixed platform, removal of bulkheads and other engineered shorelines and regrading during shoreline naturalization, construction of the CSO extension; and
- Upland construction activities such as construction of the multi-use path, four pedestrian bridges, Starlight Park, the amphitheater and concessions area, retaining walls, and the boathouse.

Results from the bathymetry study will be used to assist in determining the location of the dock so as to minimize the amount of dredging required and the amount of mudflat disturbed. Potential impacts associated with dredging for the floating dock include possible resuspension of sediment-associated contaminants and temporary increases in turbidity. Resuspension of sediments will be localized to the immediate area around the dredging and will be temporary. The floating dock will be designed with the smallest practical dimensions to meet applicable safety and accessibility regulations and minimize obstruction of river flow, shading, and dredging.

The CSO extension will deck over approximately 0.016 hectares (HA) (0.04 acres) of littoral zone wetland [waters less than 1.8 m (6 feet) deep] pending NYCDEP construction. Fill activities will have the potential to cause temporary increases in suspended sediment in the immediate area where the fill is placed. Activities associated with bulkhead and riprap removal during restoration of natural shorelines also have the potential to result in localized, temporary increases in suspended sediments. Sediment control measures will be taken to minimize the amount of resuspended sediment and could include such measures as the use of turbidity curtains.

Stormwater from the Project Site will be managed to reduce direct discharges to the Bronx River. A stormwater pollution prevention plan (SWPPP) will be developed in accordance with NYSDEC's State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-02-01. There will be potential for on-site erosion and sedimentation at construction sites where soils will be disturbed (i.e., bulkhead and riprap removal, installation of landscaping, construction of retaining walls, removal of impervious surfaces, etc.). The SWPPP will include erosion and sediment control measures that comply with the "New York Standards and Specifications for Erosion and Sediment Control" such as hay bales, silt fencing, vegetative covers, and slope and soil stabilization. The abutments for the four pedestrian bridges, the multi-use path, and retaining walls will be built in upland areas. The construction of these components will be managed under the SWPPP and will not be expected to result in significant adverse impacts to water quality. Planting of the graded, naturalized shorelines with native vegetation will reduce the potential for erosion and sedimentation in these areas. The SWPPP will also include measures to manage stormwater following construction in accordance with the "New York State Stormwater Management Design Manual."

Starlight Park has a separate stormwater management plan to manage stormwater and reduce discharges to the Bronx River. Silt fences have been placed along the Bronx River shoreline adjacent to the park in preparation for remediation activities. Therefore, construction of the park will not be expected to adversely impact water quality.

Floodplains

Construction of the upland project elements (pedestrian bridges, multi-use path, amphitheater, etc.) and in-water project elements (floating dock and CSO extension) will not impede flood waters or result in increased flooding in areas adjacent to the Project Site. The naturalized shorelines will be constructed so as to not increase flooding or erosion on the site or the surrounding area.

Navigable Waters

Construction of the upland project elements (pedestrian bridges, multi-use path, amphitheater, etc.) and in-water project elements (floating dock and CSO extension) will not impede navigation in the Bronx River. This portion of the Bronx River is not used by ocean-going or commercial vessels.

OPERATION

Surface Water Quality

Starlight Park has a separate stormwater management plan to manage stormwater and reduce discharges to the Bronx River. Recreational boats visiting the park will be limited to small personal watercraft such as kayaks and canoes. These watercraft have shallow drafts and will not disturb the river bottom. Their use in the Bronx River will not result in significant adverse impacts to water quality. Therefore, operation of the park will not be expected to result in significant adverse impacts to water quality.

Naturalization of shorelines and planting of wetland areas with native wetland species will be expected to result in improvements to water quality. Installation of the CSO tide gate, increased green space, reduced impervious surfaces, and reductions in direct discharges to the river will result in additional benefits to water quality in the lower Bronx River. Therefore, operation of the Proposed Project will not be expected to result in significant adverse impacts to water quality.

Floodplains

Per Executive Order 11988 and 23 CR 650, a Floodplain Analysis was conducted to ensure that the planned Greenway development that lies within the floodplain is the only practicable alternative for the proposed project (see Attachment D-A3).

Conversion of 1.35 HA (3.33 acres) of impervious surfaces to green space and improved stormwater management practices will improve the water retention and detention ability of the lands within the Project Site. This should result in increased infiltration and detention of stormwater, delaying the discharge of surface runoff to the Bronx River and reducing the volume of stormwater contributing to the potential for flooding. Shoreline naturalization will not impede flood waters and will be expected to slow the movement of floodwaters during extreme precipitation events. Therefore, operation of the Proposed Project will not be expected to result in significant adverse impacts to floodplains.

Navigable Waters

The floating dock in the river will promote non-motorized recreational boating on the river, including kayaking and canoeing. The use of these types of small non-motorized watercraft will not be expected to result in adverse impacts to the aquatic environment or surrounding land and

water uses. As the river is too shallow to allow for passage of commercial and ocean-going vessels and the passage of such vessels is also limited by the fixed bridges and weir, the Proposed Project will not create conflicts among recreational, ocean-going, or commercial vessels.

D. REFERENCES

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Chapter D-10: Coastal Zone Management

A. LEGAL FRAMEWORK

The Bronx River Greenway Project is located within New York City's Coastal Zone Boundary as outlined in the Department of City Planning's Coastal Zone Boundary of New York City, June 1986. As such, this chapter discusses the Proposed Project with respect to coastal zone management.

The federal Coastal Zone Management (CZM) Act of 1972 was established to support and protect the distinctive character of the waterfront, and set forth standard policies for reviewing proposed development projects along coastlines. In response to the CZM Act, New York State adopted its Coastal Management Program, 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.

The program encourages coordination among all levels of government to promote sound waterfront planning and requires consideration of the program's goals in making land use decisions. It also provides for local implementation when a municipality adopts a local waterfront revitalization program, as is the case in New York City. The New York State Department of State (NYSDOS) administers the program at the State level, and the New York City Department of City Planning (DCP) administers it in the City.

The *New York City Waterfront Revitalization Program* (WRP) is the City's principal coastal zone management tool. The WRP was originally adopted in 1982 and approved by NYSDOS for inclusion in the New York State Coastal Management Program. The WRP establishes the City's policies for development and use of the waterfront and provides a framework for evaluating discretionary actions in the coastal zone. WRP was revised and a new WRP approved by the City Council in October 1999. In August 2002, the New York State Department of State and Federal (i.e., the U.S. Army Corps of Engineers) authorities adopted the City's 10 WRP policies for projects located within the City boundaries. This chapter reviews the 10 New York City coastal zone policies of the WRP, and assesses, where applicable, the general consistency of the project with these policies. NYSDOS issued its determination of General Concurrence for the Proposed Project on December 9, 2004.

B. LOCAL WATERFRONT REVITALIZATION PROGRAM (LWRP) CONSISTENCY DETERMINATION

New York City's WRP includes 10 policies designed to maximize the benefits derived from economic development, environmental preservation, and public use of the waterfront, while minimizing the conflicts among those objectives. Each policy is presented below, followed by a discussion of the Proposed Project's applicability to, and consistency with, the policy.

Policy 1: Support and facilitate commercial and residential development in areas well-suited to such development.

Policy 1.1: Encourage commercial and residential redevelopment in appropriate coastal zone areas.

The Proposed Project does not include any commercial or residential development. Therefore, this policy does not apply.

Policy 1.2: Encourage non-industrial development that enlivens the waterfront and attracts the public.

Goals of the Proposed Project include enhancement of public access to the Bronx River and provision of a quality facility for people to cycle, walk, run, or skate for transportation, recreation, or exercise. The provision of open space, visual access, upland connections, and water-related uses by the Proposed Project will be consistent with this policy.

Policy 1.3: Encourage redevelopment in the coastal area where public facilities and infrastructure are adequate or will be developed.

The Proposed Project is a public open space that does not include redevelopment activities. Therefore, this policy does not apply.

Policy 2: Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.

Policy 2.1: Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.

The Proposed Project is not located in a Significant Maritime and Industrial Area; therefore, this policy is not applicable.

Policy 2.2: Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas.

The Proposed Project does not include a working waterfront use. Therefore, this policy does not apply.

Policy 2.3: Provide infrastructure improvements necessary to support working waterfront uses.

The Proposed Project does not include a working waterfront use. Therefore, this policy does not apply.

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

Policy 3.1: Support and encourage recreational and commercial boating in New York City's maritime centers.

One goal of the Proposed Project is to improve public access to the Bronx River waterfront. The construction of a canoe and kayak floating dock in the river will promote recreational boating on the river. Commercial boating is not important on this river due to its shallow depths and the location of a weir between East 172nd Street and East 174th Street. Commercial vessels have not used the river since the 1920s. Therefore, the Proposed Project will be consistent with this policy.

Policy 3.2: Minimize conflicts between recreational, commercial, and ocean-going freight vessels.

For the reasons noted above, the Bronx River is not an important waterbody for commercial boats. The river is too shallow to allow passage of commercial or ocean-going vessels. Therefore, the Proposed Project will not create conflicts among recreational, ocean-going, or commercial vessels and will be consistent with this policy.

Policy 3.3: Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.

Recreational boats that will use the proposed floating dock include small personal watercraft such as kayaks and canoes. The use of these types of small watercraft will not be expected to result in adverse impacts to the aquatic environment or surrounding land and water uses. Therefore, the Proposed Project will be consistent with this policy.

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

Policy 4.1: Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas, Recognized Ecological Complexes and Significant Coastal Fish and Wildlife Habitats.

The Project Site is not located within a Special Natural Waterfront Area, Recognized Ecological Complex, or Significant Coastal Fish and Wildlife Habitat. Therefore, this policy is not applicable.

Policy 4.2: Protect and restore tidal and freshwater wetlands.

There are no freshwater wetlands on the Project Site. Tidal wetlands on the Project Site include littoral zone, mudflats, and vegetated areas with native and introduced wetland species. In addition to the anticipated water quality improvements which will benefit wetland areas (described in detail in the response to Policy 5), other elements of the Proposed Project include removal of bulkheads and restoration of natural shoreline with native wetland plantings, where feasible, and removal of invasive/noxious species such as Japanese knotweed and common reed. Therefore, the Proposed Project will be consistent with this policy.

Policy 4.3: Protect vulnerable plant, fish, and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.

Except for occasional transient individuals, no federally-listed or state-listed or proposed endangered or threatened species, or rare ecological communities are known to exist in the project area.

Policy 4.4: Maintain and protect living aquatic resources.

Improvements to water quality of the Bronx River resulting from the reduction in stormwater runoff and restoration of wetland habitats associated with the Proposed Project will improve conditions for living aquatic resources in the lower Bronx River. All work in wetland areas will be designed to minimize impacts to adjacent areas. Therefore, the Proposed Project will be consistent with this policy.

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

Policy 5.1: Manage direct or indirect discharges to waterbodies.

All construction activities will be carefully monitored to avoid and/or minimize discharges to the lower Bronx River. Stormwater from the Project Site will be managed to reduce direct discharges to the Bronx River. A stormwater pollution prevention plan (SWPPP) will be developed in accordance with NYSDEC's State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-02-01. Best management practices (BMPs), such as silt fences, will be implemented on site in accordance with NYSDEC's technical standard for erosion and sediment control presented in "New York Standards and Specifications for Erosion and Sediment Control" (January 2004) and will minimize potential impacts to surface waters. Conversion of approximately 1.35 hectares (HA) (3.33 acres) of paved areas to green space will also decrease direct runoff to the river. Therefore, the Proposed Project will be consistent with this policy.

Policy 5.2: Protect the quality of New York City's waters by managing activities that generate non-point source pollution.

Implementation of the SWPPP will minimize discharges to the river during construction. Stormwater management measures implemented following construction decrease the amount of stormwater runoff and non-point source pollution from the Project Site. Therefore, the Proposed Project will be consistent with this policy.

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

As described above, an SWPPP will be prepared and implemented in accordance with NYSDEC's guidance. The SWPPP will contain measures to minimize areas of disturbance and impacts to adjacent habitat, and to manage stormwater discharged to the Bronx River. Areas temporarily disturbed during construction and restoration work will be restored to their original condition through proper grading, and all temporary structures and materials will be removed following construction. Designated wetland areas to be protected will be prominently marked or barricaded. Results of the bathymetry study will be used to minimize the amount of dredging required for construction of the floating dock. Extension of the CSO by 9 m (30 feet) will adversely impact 0.016 HA (0.04 acres) of littoral zone wetland. NYSDOT will mitigate for the loss of littoral zone through the creation of wetlands within the Project Site. Therefore, the Proposed Project will be consistent with this policy.

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

As described above, the Proposed Project will decrease stormwater discharges to the lower Bronx River and should result in improved water quality. The Proposed Project will not be expected to affect groundwater. Water is continuously flowing from an underground source just north of the East 174th Street viaduct. If this water is determined to be from a natural source, the project will retain and enhance the spring and associated small stream as a feature of the park and Greenway. Therefore, the Proposed Project will be consistent with this policy.

Policy 6: Minimize the loss of life, structures, and natural resources caused by flooding and erosion.

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

The entire shoreline of the Bronx River within the Project Site is stabilized with riprap or bulkhead. There is a small area of natural rock-lined shoreline. Conversion of approximately 1.35 HA (3.33 acres) of impervious surfaces to green space will improve the water retention and detention within the Project Site which should reduce the potential for flooding. Restoration of natural shorelines where bulkheads currently exist in the vicinity of the currently paved properties will be conducted where feasible. The Proposed Project will not impede flood waters or result in increased flooding of adjacent areas. All disturbed and graded areas will be planted to minimize erosion. In accordance with the SWPPP, measures to reduce erosion will be implemented during construction. Therefore, the Proposed Project will be consistent with this policy.

Policy 6.2: Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.

As described above, various elements of the Proposed Project will have the potential to decrease the discharge of stormwater to the Bronx River, which may decrease the potential for flooding along the river. Therefore, the Proposed Project will be consistent with this policy.

Policy 6.3: Protect and preserve non-renewable sources of sand for beach nourishment.

There are no non-renewable sources of sand on or near the Project Site; therefore, this policy does not apply.

Policy 7: Minimize environmental degradation from solid waste and hazardous substances.

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

Due to historical uses of the Project Site, contaminated soils exist in portions of the site, including Starlight Park. Starlight Park is currently undergoing cleanup, which is anticipated to be complete prior to construction of the project. The greatest potential for exposure to any site contamination would occur during demolition of existing structures and during any soil disturbance associated with development of the Greenway. Samples collected from each of the twenty-six locations contained at least one type of contaminant (SVOCs, VOCs, PCBs, or Metals) at levels that exceed either STARS or RSCO guidance values; and therefore, any soils disturbed along the project site during construction should be considered as potentially contaminated. With the exception of the Apex Auto site, soils across the site did not exhibit hazardous waste characteristics based on TCLP analysis. However, the RCRA hazardous waste level for lead was exceeded in several samples collected from the southwest region of the Apex Auto site. Soils to be excavated in this area should be considered as potentially contaminated and hazardous. It is possible that other areas of significant contamination exist on the Apex site in areas not accessible for sampling due to surface obstructions and daily operations.

Areas identified with surface soil (top two feet below final grade) contamination will be addressed in one of the following ways: excavate and dispose of in accordance with applicable rules and regulations; fence to restrict Greenway user access; or cover with impervious surface (e.g., asphalt) or at least two feet of clean soil to eliminate future exposure pathways.

During the final design of the project, provisions will be included in the contract documents to ensure any contaminated and/or hazardous sediments, soil or groundwater will be handled, transported, and disposed of in accordance with all applicable federal, state and local regulations. A site-specific Environmental Health and Safety Plan (HASP) will be prepared and implemented to protect workers, the community and the river from impacts from known or potential contaminated soil or groundwater. The HASP will include procedures to: minimize the generation of dust (and both work zone and community dust monitoring); properly remove and dispose of contaminated soil and procedures to address contamination (including tanks, drums, etc.) unexpectedly encountered; and manage any groundwater, should dewatering be required.

Solid wastes generated during construction will be disposed of by a licensed waste hauler at an appropriate licensed facility (to be determined). As discussed above, the Proposed Project will include pollution prevention measures such as reduction of direct discharges to the Bronx River. Therefore, the Proposed Project will be consistent with this policy.

Policy 7.2: Prevent and remediate discharge of petroleum products.

As discussed above under Policy 7.1, soil sampling will be completed prior to construction to better determine the nature and extent of any contamination. If the soil sampling program reveals the presence of petroleum products within the Project Site, or if petroleum products are encountered during construction activities, such products will be handled, remediated, and/or disposed of in accordance with all applicable laws, rules, and regulations. As a result, the Proposed Project will be consistent with this policy.

Policy 7.3: Transport solid waste and hazardous substances and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.

All solid waste generated by the Proposed Project will be transported by a licensed waste hauler according to applicable laws and regulations. As a result, the Proposed Project will be consistent with this policy.

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

Policy 8.1: Preserve, protect and maintain existing physical, visual, and recreational access to the waterfront.

The Proposed Project will facilitate access to the waterfront by providing a bike and pedestrian path along the Bronx River, three new bridges crossing the river, a new waterfront open space between Westchester and East Tremont Avenues, and a canoe and kayak floating dock. The Proposed Project will not create any new significant visual obstructions to the Bronx River. Therefore, the Proposed Project will be consistent with this policy.

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

As discussed in response to Policy 8.1, public access to the Bronx River will be provided as part of the Proposed Project via the pathway, new waterfront open space between Westchester and East Tremont Avenues, and non-motorized watercraft dock. Therefore, the Proposed Project will be consistent with this policy.

Policy 8.3: Provide visual access to coastal lands, waters, and open space where physically practical.

As discussed in response to Policy 8.1, the Proposed Project will improve visual access to the Bronx River waterfront and will be consistent with this policy.

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

The Proposed Project will open up the waterfront for recreational activities and create recreational opportunities available at Starlight Park. Therefore, the Proposed Project will be consistent with this policy.

Policy 8.5: Preserve the public interest in and use of lands and waters held in public trust by the State and City.

The Proposed Project will not interfere with the continued use or ownership of land and waters held in the public trust. Therefore, the Proposed Project will be consistent with this policy.

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

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

The Proposed Project is not within an area suitable for working waterfront activities. However, several project elements will improve the visual quality associated with the Bronx River waterfront. These improvements include: construction of the new amphitheater park at the northern portion of the Project Site, viewing platforms, naturalization and planting of shorelines where feasible, increased landscaping at the improved street intersections, and the removal of garbage and debris from the shorelines and upland areas. Therefore, the Proposed Project will be consistent with this policy.

Policy 9.2: Protect scenic values associated with natural resources.

The scenic value of the Project Site will be significantly increased by the removal of garbage and debris from the river and shorelines, the increase in green space, the restoration of natural shorelines, the removal of invasive species from wetland and other natural areas, and planting with native species. Therefore, the Proposed Project will be consistent with this policy.

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

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

The Westchester Avenue station of the New York, New Haven and Hartford Railroad, located next to the AMTRAK tracks is eligible for New York City Landmarks designation. However, in a letter dated March 24, 2005, the State Historic Preservation Office (SHPO) determined that the station does not meet the State/National Register (S/NR) criteria due to its deteriorated state and loss of some historic features. The U.S. Post Office, West Farms Station on Devoe Avenue has been determined to be eligible for S/NR listing as part of a thematic nomination of U.S. post offices built between 1858 and 1943. However, neither the Westchester Avenue train station nor the post office building are close enough to project construction activities to be affected by the Proposed Project.

The AMTRAK bridge and the No. 6 subway viaduct are eligible for S/NR listing. To avoid adverse impacts from construction activities, NYSDOT will implement construction protection plans for the AMTRAK and No. 6 subway bridges in consultation with SHPO and the New York City Landmarks Preservation Committee (LPC). Therefore, the Proposed Project will be consistent with this policy.

Policy 10.2: Protect and preserve archaeological resources and artifacts.

Archaeological Documentary Study was prepared for the Proposed Project December 2004. This study evaluates the possible presence of both potential Native American and 19th century archaeological resources within the archaeological area of potential effect (APE) (Figure D-11-2).

SHPO and LPC reviewed and concurred with the 2004 Archaeological Documentary Study's determinations and recommendation of a series of soil borings in the four potentially sensitive areas prior to any archaeological field investigations. A soil boring program was completed in March 2005 and its results made an Addendum to the Study. It concluded that Areas 1, 2, 3, and 4 of the Project Site are indeed potentially sensitive for Native American and 19th-century archaeological resources, not having experienced extensive subsurface disturbance, with natural soils below fill in some areas and continuous natural strata from the surface down in others.

NYSDOT will conclude the Section 106 process during Final Design by following the State Education Department (SED) Work Scope and established Section 106 procedures between FHWA, NYSDOT and SHPO. NYSDOT's next step will be immediately to implement its plan for shovel pits and mechanical trenches to determine the presence, nature and extent of any potential archaeological resources, evaluate their S/NR eligibility and any develop any required mitigation. NYSDOT will then combine this information with that concerning Architectural resources, make a determination of effect for the project as a whole and forward its Finding with Summary Documentation to SHPO/LPC/FHWA for their review and concurrence. Therefore, the Proposed Project will be consistent with this policy. ✷

A. INTRODUCTION

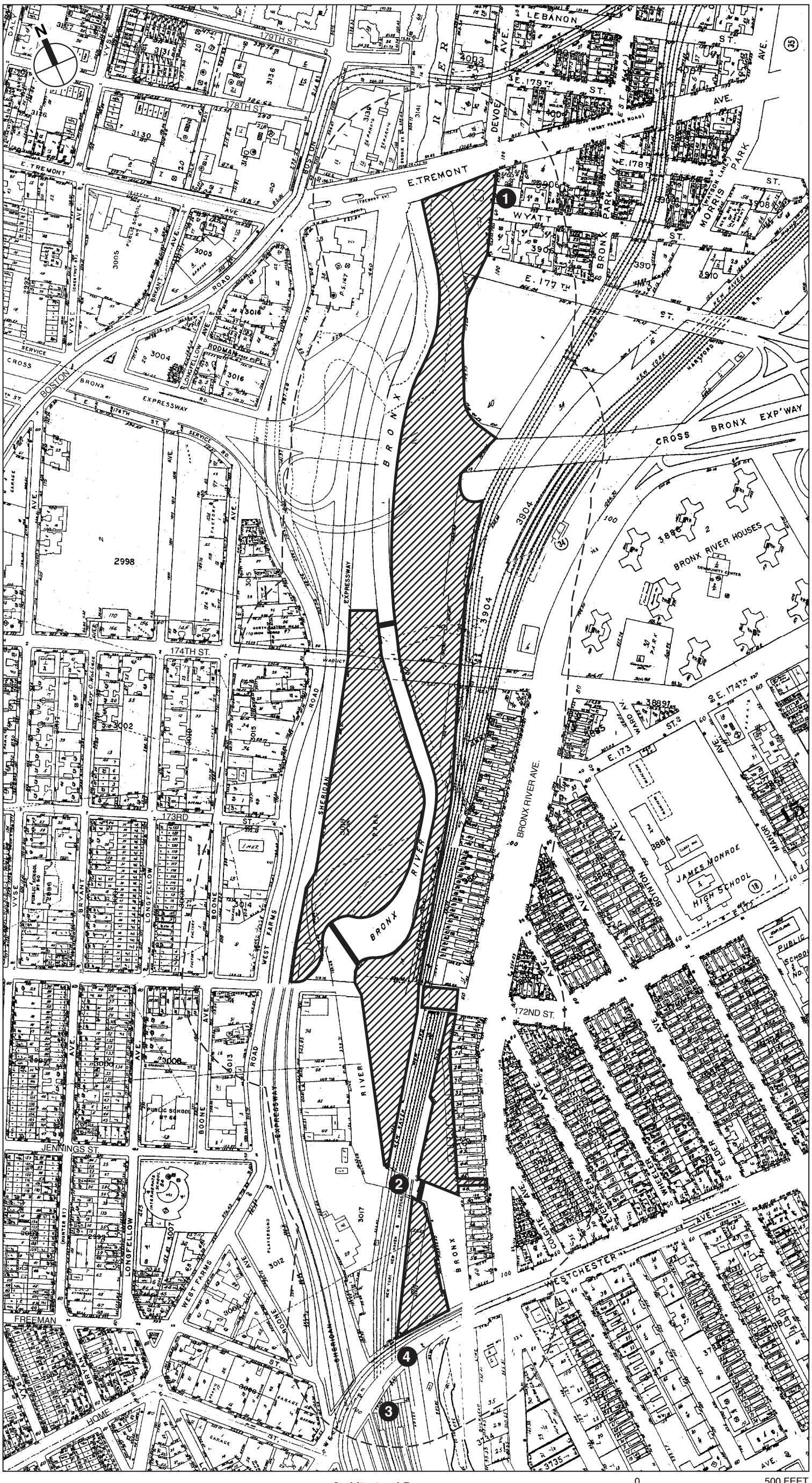
This chapter considers the potential effects of the proposed Bronx River Greenway multi-use path. It was prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as implemented by 36 Code of Federal Regulations (CFR) Part 800. These regulations require that federal agencies consider the effects of their actions on any properties listed on or determined eligible for listing on the State and National Registers of Historic Places (S/NR), and that they afford the federal Advisory Council on Historic Preservation the opportunity to comment. S/NR-listed properties and properties determined eligible for S/NR listing can include archaeological resources, as well as historic resources, which can include buildings, structures, objects, sites, and districts. Further, these laws require the opportunity for public comment on the project's effects on cultural resources. The project's public outreach program was developed to comply with the National Environmental Policy Act (NEPA) and the NHPA with regard to public participation.

Area of Potential Effect: The Area of Potential Effect (APE) for archaeological resources is the area that will be disturbed for project construction. This is, horizontally, the Project Site itself (see Figures D-11-1 and 2) and, vertically, within this area to a depth of approximately 3m (10 feet), the deepest anticipated excavation for construction. Study areas for architectural resources are determined based on the area of potential effect for construction-period impacts, such as ground-borne vibrations, and on the area of potential effect for visual or contextual effects, which is usually a larger area. For this project, the APE for architectural resources has been defined as the area within an approximately 122 m (400-foot) radius of the Project Site (see Figure D-11-1). Within the latter APE, architectural resources that were analyzed include properties listed on the State and National Registers of Historic Places or S/NR-eligible properties, National Historic Landmarks (NHLs), New York City Landmarks (NYCLs) and Historic Districts, and properties determined eligible for landmark status. In addition, other properties in the study area were evaluated for their potential S/NR or NYCL eligibility.

Evolution of Project Limits and Associated Section 106 Coordination: Historic and cultural resource research, coordination and documentation needs have changed over the course of this project. The location and design of specific work to be performed by NYSDOT as one among several state and local agencies involved in a coordinated effort with the community to realize its longstanding goal of environmental improvement and revitalization of the Bronx River.

The Proposed Project’s vision of non-motorized transportation and park improvements along the length of the Bronx River from Soundview Park north to East Tremont Avenue was to be implemented by the various agencies through a set of separate but coordinated contracts. Originally, since the NYC Department of Environmental Protection (NYCDEP) planned a multi-million dollar subsurface water storage facility at 172nd Street, it agreed in April, 2000 to prepare environmental documentation for the entire northern section of the project area from 172nd Street to Tremont Avenue. This was a CEQR Environmental Assessment (EA), but

11.3.06



Project Site Area

Study Area Boundary (400-Foot Perimeter)

Architectural Resources

1. *West Farms Station, U.S. Post Office*
2. *Amtrak Bridge*
3. *Westchester Avenue Station*
4. *IRT Number 6 Subway Truss Bridge*

0 500 FEET

SCALE

Architectural Resources

Figure D-11-1

BRONX RIVER GREENWAY

11.6.06

Project Site Area

Potential Archaeological Sensitivity

BRONX RIVER GREENWAY

Areas of Potential Archaeological Sensitivity

Figure D-11-2

developed in concert with NYSDOT to simultaneously satisfy SEQR and NEPA requirements for any work NYSDOT planned in this segment. Under the same PIN, X027.05, NYSDOT was to design and construct the needed improvements for the remainder of the corridor from 172nd Street south to Soundview Park, for which it would do separate environmental documentation. Cultural resources coordination with involved agencies initially proceeded based on these limits.

Subsequent to these efforts, the project and interagency responsibilities in the corridor underwent significant change. NYCDEP postponed its 172nd Street-to-Tremont CSO project to 2012 and with that, its EA for the northern portion of the project area. The New York City Parks Department (NYCDPR) obtained Federal Enhancements funds for the portion of the Greenway on the east bank of the Bronx River from Westchester Avenue to the Bruckner Expressway and so took this work over from NYSDOT, and NYSDOT determined that, due to an upcoming Bruckner-Sheridan interchange project, any work from the Bruckner expressway south would best be done under that future project. NYSDOT then redefined its project limits as from Westchester Avenue north to Tremont Avenue, taking over all environmental documentation responsibilities from NYCDEP and NYCDPR for this portion of the City's Greenway system. It is within this new project area, between Westchester and Tremont Avenues, that NYSDOT proposes to build a 1.8km (1.14 mi) multi-use pathway and four bridges as a critical link in the City 's Greenway system, including numerous incidental park and engineering features such as retaining walls, plantings, benches, etc.

B. EXISTING CONDITIONS

BACKGROUND HISTORY

The project site falls within the overlapping Bronx neighborhoods of West Farms, East Tremont, and Crotona Park East. The immediate project area (the APE for archaeological resources) south of East 172nd Street straddles the Bronx River and is generally comprised of paved, fenced parking/commercial lots behind bulkheads, with AMTRAK rail lines on the west and the very busy Westchester Avenue with its raised subway line to the south. The wider context (to the 400-foot limit describing the APE for architectural resources) consists of residential apartment buildings and city streets to the east and industrial uses and the Sheridan Expressway to the west. The central part of the site, from 172nd Street to the Cross Bronx Expressway (CBE), lies between the River and the AMTRAK rail lines and is generally unpaved and vegetated, varying from successional forest in the south, to mature forest just south of 174th Street, to old field meadows north of 174th Street with some remnant pavements and fences. In the larger context, the project area is lower than adjacent residential apartment buildings and city streets to the east and will be connected with new bridges to the extensive park development of Starlight Park on the west bank. North of the CBE, the project is a narrow riparian border with a successional forest, threading between ramps of the CBE, the Sheridan Expressway on the west and an extensive paved MTA bus depot on the east to 177th Street, then continuing briefly, to East Tremont Avenue. Both 177th Street and East Tremont Avenue will be extensively reconfigured.

In 1639 the Dutch West India Company purchased what would become the Bronx from the Lenape Indians. The first Europeans to settle in the area were the family of the Swedish sea captain Jonas Bronck, who bought a 500-acre tract of land between the Harlem and Bronx Rivers in 1641. Bronck's house, believed to have been located east of the Third Avenue Bridge in the vicinity of Lincoln Avenue and 132nd Street, was the site of a 1642 peace conference with

the Wiechquaesgeck Indians. Around 1700, the remaining Native Americans left the southern Bronx. After 1775, the British Army controlled the Bronx, finally relinquishing control in 1783.

Although the Bronx remained largely rural and agricultural through the early 19th century, numerous industrial enterprises were located by 1812 along the Bronx River within the project area. An early industry was a saw and grist mill established at the end of the 17th century just to the south of East 180th Street. The mill continued to operate under different ownerships until the end of the 19th century, during which time it was enlarged and reconstructed into a large mill complex. Incorporating the industrialized riverfront, the village of West Farms became a town in 1846. After the end of the Civil War, West Farms became a bustling river port, and landfilling occurred along the western shoreline of the river between 1846 and the 1870s. The project area was incorporated into New York City as part of the Annexed District in 1874.

In 1841 the New York and Harlem Railroad opened a station in Tremont to the west of West Farms, and although a village quickly developed around the station, with East Tremont acquiring township status in 1861, the larger area around the project site remained primarily rural until the 1890s. The latter half of the 19th century witnessed the opening of additional rail lines through the project area, and after the extension of the Third Avenue elevated line in the 1890s, the area underwent rapid development, with apartment buildings constructed along the elevated rail line corridor. A trolley line along Tremont Avenue soon connected the railroad station and the Third Avenue elevated line.

The development boom in the project area continued through the early 20th century with industrial complexes operating along the river that included coal yards, bleacheries, iron works, and a gas factory, and residential construction occurring in the surrounding area. In 1904, the original IRT subway line reached West Farms with stations at West Farms Square (East Tremont Avenue at Boston Road) and East 180th Street at Morris Park Avenue. The City purchased land along the eastern shoreline of the Bronx River north of 172nd Street and constructed the 180th Street IRT subway service yard near the river. The Westchester Avenue Station (discussed below) on the New York, New Haven & Hartford Rail Road line that runs along the river opened in 1908. An amusement park, Starlight Park, was built on the western shoreline in the 1910s that operated until the 1940s. Construction of the Cross Bronx Expressway (completed in 1955) cut a large swath thought the project area, and construction of the Sheridan Expressway between 1958 and 1962 caused the Bronx River to be straightened and moved slightly eastward.

ARCHAEOLOGICAL RESOURCES

Previous Project Coordination: In June 2001, the New York State Historic Preservation Office (SHPO) reviewed an earlier version of the Proposed Project that would have constructed a Greenway between Soundview Park and East 172nd Street. That project area overlaps with the southern portion of the Project Site. It is important to note that the documentation sent to SHPO by NYSDOT was a copy of a State Education Cultural Resources Survey prepared in 1987 for another project, Hunt's Point Access (X730.17), whose project limits overlapped only a small part of those for NYSDOT's project as defined at that time. It was not expected that this would be all the documentation needed; rather, NYSDOT only sought to open discussion with SHPO and the City of New York Landmarks Preservation Commission (LPC) concerning the Proposed Project as defined at that time. Without discussion or further review, however, in a letter dated June 28, 2001 SHPO determined that the previous version of the project would have No Impact upon S/NR-listed or S/NR-eligible cultural resources. LPC reviewed the same materials in June 2001 and issued two "Environmental Review" letters, both dated June 19, 2001, determining that the Project Site had no archaeological or architectural significance.

These materials and opinions were forwarded to the Federal Highway Administration (FHWA) who responded on July 25, 2003 with its concurrence that the project would have "No Effect" on cultural resources and its indication that the requirements of 36 CFR had been met.

In parallel coordination for the northern segment, NYCDEP commissioned the consulting firm of URS to perform a Phase IA Archaeological survey and Documentary Research Study for the East River CSO (April 2000) for the area from 172nd Street to Tremont Avenue. The report recommended Phase 1B archaeological testing, specifically 4 backhoe trenches (two on each side of the Bronx River between 172nd to 174th Street) and shovel test pits on both sides of the River from 177th to 179th Streets for potential revolutionary war remains.

When NYCDEP postponed its CSO project and NYSDOT redefined its project limits as described above, further coordination with SHPO, LPC and FHWA was required. NYSDOT's cultural resources coordination up to that time had applied to a project area largely south of the redefined current project limits.

Ongoing Project Coordination: The redefined project limits included a large area that had not been thoroughly investigated for archaeological sensitivity under prior studies. Therefore, NYSDOT sent letters to SHPO and LPC on April 21, 2004 alerting both to the location shift and asking whether SHPO's original opinion and LPC's determinations were still valid or whether additional information was needed.

SHPO responded on June 9, 2004 confirming its No Impact opinion but LPC, in an Environmental Review letter dated May 6, 2004, found that there is the potential for the recovery of Native American and 19th-century archaeological resources on the project site, based on a review of historic maps and archaeological sensitivity models. Accordingly, LPC recommended that an archaeological documentary study be performed for the Project Site to clarify the initial sensitivity assessment and to provide a threshold for the next level of archaeological review, if necessary. Therefore, as requested by LPC, an Archaeological Documentary Study was prepared for NYSDOT by Historical Perspectives, Inc. in December 2004. That report was submitted both to SHPO and LPC on March 7, 2005 for review and comment, and in a letter dated March 24, 2005 LPC concurred with the recommendations presented in the report. SHPO also concurred with the report's recommendations, per correspondence dated May 25, 2005.

Archaeological Documentary Study Summary: The Archaeological Documentary Study evaluates the possibility that archaeological resources may exist on the Project Site. As requested by LPC, it focuses on both potential Native American archaeological resources and on those from the 19th century. An assessment of the Project Site's archaeological sensitivity was based on the presence of known archaeological sites in the vicinity, a review of prior archaeological studies and soil borings (including the previously described URS investigations performed for DEP as well as the study performed for the Hunts Point Access project (X730.17) to the south), site file research at SHPO and the New York State Museum, a consideration of the area's former and current topographic and physiographic characteristics, cartographic research, and a review of documentary materials. The report acknowledges that no prior investigations adequately covered the portion of the redefined project's APE between the Cross Bronx Expressway and Westchester Avenue. In addition to documentary research, an initial pedestrian reconnaissance and photographic record was conducted in October 2004, noting areas of obvious ground disturbance. The following discussion summarizes the report's findings.

In general, the Project Site has a high potential sensitivity for Native American archaeological resources, because a Native American presence is well documented for the Bronx and the area immediately surrounding the Project Site. A known Native American path ran along the Bronx River with a section following East Tremont Avenue, and several inventoried archaeological sites have been identified in the vicinity of the Project Site. Of those sites, shell middens depicted on the Westchester County Historical Society's Map of Westchester County Showing Indian Occupation (1978) and three sites recorded in 1922 by former state archaeologist Arthur C. Parker may have been located within the Project Site. Because of the altered course of the river and the unreliability of older maps, however, it cannot be said conclusively that these were within the archaeological APE.

Typically, Native American resources are encountered within several feet of the historic land surface, but resources can be buried much deeper adjacent to a river with alluvial floodplain, such as the Bronx River, and the accretion of alluvial deposits can serve to protect potential resources from subsequent historic disturbance. While the project site has a high potential for Native American resources, sections of it have experienced extensive prior disturbance. In some areas, this disturbance may have been deep enough to negate the potential for resources to have remained undisturbed on the Project Site.

The Archaeological Documentary Study divides the large Project Site into seven areas to facilitate the discussion of the site's record of subsurface disturbance, 19th-century occupational history, and potential archaeological sensitivity for Native American and 19th-century resources (see Figure D-11-2). From north to south, the areas are as follows:

- Area 1 is the northernmost portion of the Project Site, bounded by East Tremont Avenue and the Cross Bronx Expressway;
- Area 2 is roughly bounded by the Cross Bronx Expressway and East 174th Street;
- Area 3 is located on the east side of the Bronx River between East 174th and East 172nd Streets;
- Area 4 is a small triangular section of the Project Site, which is bounded by the Bronx River on the west, East 172nd Street on the north, the AMTRAK rail line on the east, and the AMTRAK bridge over the river on the south;
- Area 5 is adjacent to Area 4 on the east side of the rail line between East 172nd Street on the north and a bend in the Bronx River on the south;
- Area 6 is the current site of Starlight Park on the west side of the Bronx River between East 174th and East 172nd Streets; and
- Area 7 is the southernmost portion of the project site, bounded by the Bronx River on the north and east, the AMTRAK rail line on the west, and Westchester Avenue on the south.

The following discussion summarizes the potential archaeological sensitivity of the seven Project Site areas.

AREA 1

Area 1 of the Project Site is potentially sensitive for both Native American and 19th-century archaeological resources outside of the locations of modern structures that include a gas station

and automobile repair facility near East Tremont Avenue. Although documentary evidence confirms that a complex of 19th-century mills owned by Philip Lydig were located north of the project site, there is the potential for a mill site to exist in Area 1.

Archaeological resources may be located within Area 1 at depths of up to 6 to 9 feet below grade, although it is possible that archaeological resources, if they exist, may have been disturbed by previous construction for Exposition Park (an amusement park) in 1917, Starlight Park that took over and expanded Exposition Park in the late 1920s, and a U.S. Army vehicle maintenance facility that was located on the site between 1942 and 1946. It cannot be clearly determined whether documented disturbances related to prior construction have exceeded the depths at which archaeological resources—both Native American and 19th-century resources—may be identified.

A 2001 Phase 1A survey of the East River CSO Facility reviewed soil borings taken prior to the construction of the Cross Bronx Expressway and for the proposed construction of the Bronx River CSO Conduit. The site evaluated in that Phase 1A survey overlapped a small portion of Area 1 at the intersection of East 177th Street and Devoe Avenue. An analysis of boring logs collected between the Cross Bronx Expressway and East 177th Street found that bedrock was buried between three and 17 feet below grade. Fill of varying thickness above sand and gravel sediments was identified above bedrock. The Phase 1A survey concluded that potential Native American deposits may be found in the vicinity of the borings between six and nine feet below grade.

AREA 2

Area 2 is potentially sensitive for archaeological resources. Since Area 2 was historically about 500 feet east of the Bronx River, any undocumented mills associated with the Lydig estate would not have been located within Area 2. The only documented 19th-century development within Area 2 was the Alexander Smith Carpet Factory (1851-1860s) that may or may not have been located within Area 2, as it was depicted adjacent to the river on historic maps. This particular factory was the early site of a nationally-significant carpet enterprise and, although foundations of the factory may not provide much of an archaeological footprint, the associated buried features on the grounds may be revealing of the workers at the complex. In addition, three late-19th-century buildings once stood adjacent to the northeast corner of Area 2, but this area was subsequently disturbed by the extensive engineering efforts required to meet the necessary grade of the New York, Westchester, and Boston Railway. Furthermore, the Cross Bronx Expressway and support structures were built in this vicinity.

Area 2 experienced extensive 20th-century construction disturbance for Starlight Park and the Cross Bronx Expressway that may have disturbed any potential archaeological resources, if they existed on the Project Site. However, since it is possible that fill was added to the area, as is evident in soil borings collected for the construction of the Cross Bronx Expressway, shaft features (e.g., privies) associated with the carpet factory may exist beneath the fill. Isolated areas of Native American archaeological resources may also exist.

AREA 3

Area 3 is potentially sensitive for both the footprint and associated shaft features of a factory, as well as potential Native American resources. A lack of 20th-century development in Area 3 suggests that portions are potentially sensitive for remnants of a mid- to late-19th-century factory that was later used as a dwelling and ice house. Since the factory stood prior to the

availability of sewer and water lines, which were laid in Westchester Avenue in the late 19th century and on Bronx River Avenue between 1921 and 1927, there is the potential for shaft features to exist within Area 3. Further, since Area 3 lacked extensive historical land manipulation, it is possible that Native American resources could remain within undisturbed portions of this section of the Project Site.

AREA 4

Area 4 is considered potentially sensitive for Native American resources, because of the probable accretion of alluvial deposits and because it did not experience historical development. Documentary and cartographic research indicates that Area 4 was not developed historically, and, therefore, has no potential for 19th-century resources. Although this portion of the Project Site was lower-lying than the areas to the north and was probably never utilized for extended Native American habitation, it is possible that Area 4 was utilized for resource procurement and/or processing and that potential remains from those uses may exist within this section of the Project Site. Most likely, this low-lying area experienced repeated flooding that would have deposited deep levels of alluvial strata over potential Native American resources that could include shell middens and resource procurement stations.

AREA 5

Area 5 is not considered sensitive for Native American or 19th-century archaeological resources. Development in the 1940s of the Bronx Iron and Metal Corporation complex and the Bronx River bulkhead would have disturbed any potential Native American resources. Further, Area 5 experienced virtually no 19th-century development, other than that of the railroad to the west. By 1898, a house stood beyond Area 5 with three small wood outbuildings within the Project Site, but these structures were razed by 1927 and their location was subsequently developed with the Bronx Iron and Metal Corporation complex and a parking lot. The site of the parking lot has been graded and leveled. Topographic maps show that the site previously sloped downward to the river—the parking lot is currently level.

AREA 6

Area 6 (the current Starlight Park) is not considered sensitive for archaeological resources, and in any case it is currently being disturbed for the remediation of hazardous materials. By 1872, Area 6 was partially developed with a gas works that remained on the site through the mid-20th century, although it was inactive by the 1890s. Remnants of the gas works would likely only entail building foundations, piping supports, and footings, as all above-grade facilities and equipment have been removed. Since the coal-to-gas process in the 19th century is well studied, little would be gained by archaeologically investigating any building footprints, should they exist. Potential shaft features from privies for company workers were most likely located on-site, as the gas works predated the availability of sewer and water lines. However, subsequent subsurface disturbance would have destroyed any shaft features, if they existed. In the 1940s, all of Area 6 was landscaped and turned into a City park, which is now being remediated for hazardous materials. Similarly, the location of several wooden buildings that were associated with building material yards once located in Area 6 were later disturbed by the development of Starlight Park.

Although Area 6 may have once been sensitive for Native American resources given its proximity to the Bronx River, the majority of the site has experienced subsurface disturbance

with the construction and demolition of the gas works and other commercial structures, the realignment of the river, the realignment of West Farms Avenue, and the creation of Starlight Park. Therefore, Area 6 is not considered potentially sensitive for Native American resources.

AREA 7

Area 7 is not considered sensitive for archaeological resources. This portion of the Project Site never appeared to contain historical dwellings or structures that would yield archaeological deposits, having only been developed with a series of warehouses and storage buildings in the 20th century. Any Native American archaeological resources would have been destroyed by extensive 20th-century construction episodes associated with an existing graded and leveled parking area, construction and reconstruction of the rail line and bridge over the Bronx River, filling and leveling for a new bulkhead, and multiple replacements of the bridge at Westchester Avenue. All of these actions disturbed the original stratigraphy of Area 7, and it is therefore highly unlikely that any potential Native American deposits, which may have once been located along the river, would have remained undisturbed.

Subsurface Testing: To date, aside from the analysis of boring logs, no subsurface testing specifically for archaeology (shovel pits, mechanical excavation) has been performed within the APE. The 1987 study reviewed by SHPO and LPC for the prior project limits included shovel tests, but none of those locations fall within the current archaeological APE.

ARCHITECTURAL RESOURCES

There are four known architectural resources in the architectural APE (see Figure D-11-1). The U.S. Post Office, West Farms Station at 362 Devoe Avenue has been determined eligible for S/NR listing as part of a thematic nomination of United States Post Offices built in New York State between 1858 and 1943. Constructed in 1935 as a public works project, the West Farms Station is a 2-story, brick Colonial Revival-style building. It is located at the northeast corner of the intersection with Wyatt Street, with the main façade fronting on Devoe Avenue. The building is symmetrically and simply designed with windows with stone sills and lintels and a recessed entrance flanked by stone Doric columns supporting an entablature. “United States Post Office” is carved in the frieze above the entrance. The roof is gabled with a stone cornice. The date “1935” is applied in metal numbers to the gable fronting on Wyatt Street. Decorative metal lanterns are affixed to both street facades above the first floor. There is a similarly designed one-story wing with a loading dock at the building’s rear. In the immediate vicinity of the post office building, the Project Site consists of an overgrown paved area surrounded by chain link fencing that contains trees, parked cars, and garbage.

Three architectural resources that meet the eligibility criteria for S/NR listing and/or NYCL designation were identified in the field survey of the APE conducted for this project (see Figure D-11-1) and were included in the Cultural Resources section of NYSDOT’s newly-revised Design Report that was based on NYCDEP’s prior Draft Environmental Assessment. In accordance with Section 106 of the NHPA, information on the three potential architectural resources was submitted to the SHPO on March 7, 2005 for evaluation and determination of National Register eligibility. In addition, information on the three potential architectural resources was submitted to LPC for evaluation and determination of NYCL eligibility. LPC, on March 24, 2005, requested photographs, which were subsequently sent.

Approximately 500 feet north of Westchester Avenue, the AMTRAK Northeast Corridor Line traverses the Bronx River on a Scherzer-type bascule bridge. This steel bridge was constructed

in 1907 and is one of a small number of bascule bridges in New York City. In a letter dated March 24, 2005, SHPO determined that this bridge meets S/NR eligibility Criterion C in the area of engineering and as an example of a surviving early 20th century Scherzer-type bascule bridge. It is one of only twelve bascule bridges in New York City. The bridge crosses an industrial stretch of the river that is characterized by junk yards and auto repair garages. LPC concurred.

The Westchester Avenue Station of the New York, New Haven & Hartford Rail Road is located at the southeast corner of the intersection of Westchester and Whitlock Avenues. Constructed in 1908, it is abandoned and deteriorating. Designed by Cass Gilbert in an eclectic Beaux Arts style, the station is a richly decorated terra cotta building that still extends over the tracks below, which are now operated by AMTRAK. Although in a poor state of disrepair, the building still retains much of its original multi-colored terra cotta ornamentation of rosettes, foliage, wheels, and the letters "NYH." Other remaining features include tiles on the hipped roof, a terra cotta chimney, terra cotta arches on the south and north facades, brackets supporting the roof eaves, and metal letters reading "Westchester Avenue. NY-NH-&-H-RR" over the north arched entrance. In 1958, construction of the Arthur Sheridan Expressway exit ramp immediately adjacent to the station removed the original entrance portico. Covered stairs leading from the extension to the tracks are no longer extant and all the windows and entrances have been infilled with concrete blocks. In a letter dated March 24, 2005, SHPO determined that the station does not meet the National Register criteria due to its deteriorated state and loss of some historic features. This opinion, together with the requested photographs, was forwarded to LPC who asked for a site visit. This took place on April 19, 2005. Although this building is deteriorated and has lost some of its original features, LPC has determined, in a letter dated April 29, 2005, that the station appears eligible for NYCL designation.

Where it curves from a north-south alignment to an east-west one over the Bronx River, the IRT No. 6 subway viaduct is carried on a multiple-span truss bridge. Constructed around 1920, the bridge runs above and parallel to Westchester Avenue. The western span crosses over the AMTRAK right of way (ROW), and it is a Pratt through-truss. The eastern span over the river is a Parker truss. While the Pratt truss is a common bridge type, the Parker truss is more uncommon. In a letter dated March 24, 2005, SHPO determined that the bridge is eligible for S/NR listing under Criterion C in the area of engineering. LPC concurred.

C. PROBABLE IMPACTS

NO ACTION

ARCHAEOLOGICAL RESOURCES

Without the Proposed Project, it is assumed that there will be no subsurface disturbance to most of the Project Site. Starlight Park is currently being disturbed for contaminated materials remediation. However, since it has been determined that the site of Starlight Park is not archaeologically sensitive, no resources will be disturbed in any case.

ARCHITECTURAL RESOURCES

The only project planned or under construction in the study area with an anticipated completion date before the project build year is the contaminated materials remediation of Starlight Park. This project is not located in the vicinity of any of the four architectural resources.

PROPOSED PROJECT

CONSTRUCTION

Archaeological Resources

As described above, the Archaeological Documentary Study found four areas of the Project Site (Areas 1, 2, 3, and 4) to be potentially sensitive for archaeological resources. The study was submitted to both the SHPO and LPC on March 7, 2005 for review and comment, and the SHPO and LPC have concurred with the report's sensitivity determinations and recommendations, as written in letters dated May 25, 2005 and March 24, 2005, respectively. Where the Proposed Project would involve excavation in sensitive areas, it could result in adverse effects to archaeological resources should they exist on the Project Site. Therefore, to further investigate the presence of significant archaeological resources, the documentary study recommended that a series of soil borings be taken in the four potentially sensitive areas prior to any archaeological field investigations. A soil boring program was completed in March 2005. Borings were taken in the four areas of the Project Site identified as having potential archaeological sensitivity—deep borings were taken at the locations of the proposed pedestrian bridge piers and borings less than 33 feet deep were taken in locations where shallow excavation and surface work was proposed. The boring logs were reviewed by a professional archaeologist, and the findings were summarized in an Addendum to the Archaeological Documentary Study2. The Addendum also presented recommendations for further archaeological testing, and was submitted to the SHPO and LPC for review on June 20, 2005 with an indication that NYSDOT would complete testing (further excavation) during Final Design.

Based on a review of the soil borings, the Addendum concluded that Areas 1, 2, 3, and 4 of the Project Site are potentially sensitive for Native American and 19th-century archaeological resources. In each of the four areas, soil borings did not indicate extensive subsurface disturbance that would have destroyed any potential archaeological resources. Where fill layers were encountered, the boring logs revealed natural soils below. Other boring logs revealed levels of natural strata from the surface down to the bottom of the soil boring. The Addendum concluded that potential archaeological resources may be buried within the alluvial levels observed on the Project Site and that the depth of potential sensitivity varies depending on the depth of surface fill.

Section 4(f) applies to archaeological resources that warrant preservation in place. Any archaeological resources on the Project Site would be important because of what can be learned by data recovery. Therefore, Section 4(f) does not apply.

Architectural Resources

It is not expected that the Proposed Project will have impacts to architectural resources during the Construction period. Two such resources—the AMTRAK bascule bridge and the No. 6 subway bridge—are located close enough (within 90 feet) to proposed construction activities to potentially be affected by them. To avoid impacts to the resources from construction-period vibrations, subsidence or other accidental damage, NYSDOT will implement construction protection plans for the AMTRAK and No. 6 subway bridges in consultation with the SHPO and LPC. Per correspondence dated March 24, 2005, the SHPO has recently determined the AMTRAK bascule bridge and the No. 6 subway bridge to be eligible for the S/NR. No determination of effect has been made. Neither the U.S. Post Office, West Farms Station nor the

Westchester Avenue Station are located close enough to proposed construction activities to potentially experience construction-related effects.

It is possible that indirect impacts to the context or visual setting of the four architectural resources could result during construction. Grading, removal of retaining walls, construction of lookouts and pedestrian bridges, and other construction activities that will be visible from the surrounding bridges and transportation corridors could result in a temporary loss of context for the architectural resources nearby. However, any such impacts will only be temporary during the construction period.

OPERATION

The Greenway segment between Westchester Avenue and East 172nd Street will not have adverse contextual or visual impacts to the Westchester Avenue Station, the No. 6 subway bridge, and the AMTRAK Bridge. Replacing the paved auto yard between the AMTRAK ROW and the west bank of the river and the paved Apex Auto facility on the river's east bank with a multi-use path and a naturalized shoreline will enhance the visual setting of the three resources. In addition, the Greenway will create new viewer groups for the AMTRAK Bridge, which is only slightly visible from Westchester Avenue, as well as new vantage points for viewing the historic resources away from busy roadways. Further, the two new pedestrian bridges located in this segment will be in keeping with the study area where there are numerous bridges over the Bronx River.

The northernmost segment of the Greenway will not have adverse contextual or visual impacts to the U.S. Post Office, West Farms Station. The new amphitheater and seating area—combined with the reconfigured intersection at East 177th Street, Devoe Avenue, and East Tremont Avenue—will be a visual improvement over the overgrown paved lot used for parking that is located across the street from the post office. In addition, trees will be planted in this area to create an entrance to the Greenway and a planted pedestrian island will be constructed in the intersection. These features will not block views of the post office and will improve the pedestrian environment around the historic resource, whose historic setting has been altered by construction of the nearby MTA bus facility, the Arthur Sheridan Expressway, and the large car wash building. Overall, it is not expected that operation of the Proposed Project will have adverse contextual or visual impacts to architectural resources, which will, in fact, be enhanced by the Proposed Project.

D. STEPS TO CONCLUDE THE SECTION 106 PROCESS

NYSDOT will conclude the Section 106 process during Final Design by following the State Education Department (SED) Work Scope and established Section 106 procedures between FHWA, NYSDOT and SHPO.

NYSDOT's next step will be to immediately implement its plan for shovel pits and mechanical trenches to determine the presence, nature and extent of any potential archaeological resources, evaluate their S/NR eligibility and develop any required mitigation. NYSDOT will then combine this information with that concerning architectural resources, make a determination of effect for the project as a whole and forward its Finding with Summary Documentation to SHPO/LPC/FHWA for their review and concurrence. ✷

A. INTRODUCTION

This section presents the findings of the contaminated materials assessment and identifies potential issues of concern that could pose a hazard to workers, the community, and/or the environment during or after construction of the Greenway.

Conditions at the site resulting from previous and existing uses of the site and the surrounding areas were determined from a review of four documents, all prepared by Lawler, Matusky & Skelly Engineers LLP: *Surface Soils Investigation for the Environmental Assessment Statement in the Northern Portion of the Bronx River Greenway*, dated September 2001; *Environmental Investigation Report: Westchester Avenue Site – Southern Portion of the Proposed Bronx River Greenway*, dated March 2003; *Environmental Investigation Report: Apex Auto Site – Southern Portion of the Proposed Bronx River Greenway*, dated March 2003; and, *PCB Assessment Report – Northern Portion of the Proposed Bronx River Greenway*, dated July 2003. A Contaminated Materials Investigation and Asbestos Survey were completed as part of the project.

B. EXISTING CONDITIONS

NORTHERN PORTION OF THE BRONX RIVER GREENWAY

SUBSURFACE CONDITIONS

The depth to bedrock varies from less than 10 feet below ground surface in the central portion to approximately 35 feet in the northern portion of the site. Overlying the bedrock is silty sand, above which is man-made fill, including gravel, boulders, reinforced concrete, and other construction and demolition debris.

SITE/AREA HISTORY AND SUBSURFACE INVESTIGATION

By 1954, the area was highly developed with residential/commercial structures: the NY Coliseum bus depot was present and I-95 (Cross Bronx Expressway) and Starlight Park (which had been the site of an earlier junk yard and auto repair facility) were under construction. The earlier Northern Union Gas Company facility (on the west side of the river near 173rd Street at Starlight Park) was owned by Con Edison and no longer contained tanks. By 1966 the I-896 (Arthur Sheridan Expressway) was present and other expressways, streets, river crossings, and railroads were in approximately their current configurations.

Sixteen surface soil samples were collected and analyzed for volatile and semivolatile organic compounds (VOCs and SVOCs), pesticides, polychlorinated biphenyls (PCBs) and metals. In addition, five borings were completed in the vicinity of the proposed New York City Department of Environmental Protection (NYCDEP) combined sewer overflow (CSO). The laboratory analytical data from the samples were compared to New York State Department of

Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) as presented in NYSDEC Technical Administrative Guidance Memorandum (TAGM) 4046. The only exceedences of RSCOs were: certain SVOCs in selected samples, but at levels typically found in urban fill materials; a very slight exceedences (21 parts per billion versus the RSCO of 20 ppb) for one pesticide (heptachlor epoxide) at one location; and several metals though all but two (copper and zinc) were found at levels within the Eastern USA background range, as cited in TAGM 4046 (copper and zinc levels were well below levels associated with adverse human health effects, based on United States Environmental Protection Agency (EPA) generic soil screening levels).

Currently under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR), Starlight Park is undergoing remediation by Con Edison for contamination due to the past uses on the property. It is anticipated that remediation will be completed by 2006.

WESTCHESTER AVENUE SITE

SUBSURFACE CONDITIONS

The Westchester Avenue (New York City Marshall Impound Lot) site is bounded to the north and east by the river, to the west by AMTRAK tracks and to the south by Westchester Avenue. Beneath the asphalt paving, there is approximately two feet of decomposed concrete. Beneath the concrete, sand, gravel, and decomposed schist bedrock are present mixed with manmade fill (including coal ash and construction and demolition debris). Groundwater, which appears to be tidally influenced, was encountered at 11 to 14 feet below ground.

SITE/AREA HISTORY AND SUBSURFACE INVESTIGATION

In 1915, the site included a structure for storage of building materials (with a railroad spur). By 1950, the structure had been demolished and by 1954 at least three new structures had been constructed, but portions of the site appeared covered by debris or surface scarring. By 1984, no structures were evident, but by 1994 structures were present along the western and southern site boundaries. The 1996 Sanborn map indicated the site as vacant. The site is currently used as a school bus depot, with two structures (a small office and a garage).

A subsurface investigation was performed consisting of six soil borings. At three of the six locations, a temporary monitoring well was installed so that a groundwater sample could be collected. The laboratory analytical data from the soil samples were compared to the RSCOs. The only exceedences of RSCOs were: certain SVOCs in selected samples, but at levels typically found in urban fill materials; and several metals though all but four (copper, mercury, nickel and zinc) were found at levels within (or no more than 20 percent above) the Eastern USA background range, as cited in TAGM, but well below levels associated with adverse human health effects, based on EPA generic soil screening levels.

Results from the three groundwater samples were compared to NYSDEC Class GA Standards and Guidance Values. Although the Class GA classification applies to almost all groundwater in the State, the standards and guidance values are based on a scenario that the groundwater is used as drinking water. All drinking water in the Bronx originates in the upstate reservoir system and groundwater in the Bronx can not be used as a source of drinking water. The project corridor is not in a Sole-source-, Primary-, or Principal- aquifer area. Exceedances of GA standards or guidance values were as follows: methyl tertiary butyl ether (MTBE) was found in one well at

28 ppb (compared to the guidance value of 10 ppb); and seven metals (chromium, copper, iron, lead, magnesium, manganese and sodium) were found above GA values in at least one of the three samples. MTBE is a recent gasoline additive, commonly encountered in urban groundwater, and its presence could be related to either on-site or off-site gasoline releases. Iron, magnesium, manganese and sodium are common minerals, not likely indicative of site contamination. The highest levels of chromium, copper, and lead encountered were less than ten times the GA standard and may well be an artifact of the high levels of particulate associated with the shallow temporary wells. Even were these levels to truly represent groundwater conditions, the levels encountered do not present a threat to human health or the river.

APEX AUTO SITE

SUBSURFACE CONDITIONS

The Apex Auto parts site is bounded by the river to the south west, the railroad tracks to the west and the backyards of Bronx River Avenue houses to the east. The subsurface includes silty sand, crushed schist, and gravel as well as fill materials such as coal ash, wood, and glass. Bedrock was encountered at depths ranging from two to nine feet below ground.

SITE/AREA HISTORY AND SUBSURFACE INVESTIGATION

By 1954, four structures were present along the eastern property boundary as well as surface scarring and possible soil/debris piles. By 1966, the site was more heavily developed with numerous vehicles present. The site is currently used for automobile/metal reclamation.

A subsurface investigation was performed consisting of four soil borings. At one of the four locations, a temporary monitoring well was installed so that a groundwater sample could be collected. The laboratory analytical data from the soil samples were compared to the RSCOs. The only exceedences of RSCOs were: certain SVOCs in selected samples, but at levels typically found in urban fill materials; two pesticides (alpha-BHC and beta-BHC) at one location slightly above the RSCO; and, several metals, six of which (arsenic, cadmium, copper, mercury, nickel and zinc) were found at levels above the Eastern USA background range, as cited in TAGM 4046. However, all but arsenic were well below levels associated with adverse human health effects (based on EPA generic soil screening levels). Only one soil sample contained arsenic at levels associated with adverse human health effects. Because this sample was found at 0.61 to 1.22 m (2 to 4 ft) below grade and only slightly above the most stringent guidance levels it does not represent a significant concern.

Results from the groundwater sample were compared to NYSDEC Class GA Standards and Guidance Values. Exceedences of GA standards or guidance values were as follows: MTBE was found in one well at 35 ppb (compared to the guidance value of 10 ppb); and four metals (iron, lead, manganese and sodium). MTBE is a recent gasoline additive, commonly encountered in urban groundwater, and its presence could be related to either on-site or off-site gasoline releases. Iron, manganese, and sodium are common minerals, not likely indicative of site contamination. The level of lead was less than four times the GA standard and may well be an artifact of the high levels of particulate associated with the shallow temporary well. Even were this level to truly represent groundwater conditions, the level encountered does not present a threat to human health or the river.

PCB ASSESSMENT REPORT

Three abandoned railroad structures in the vicinity of the proposed Greenway between 172nd and 74th Streets were identified as potentially PCB-containing: a catenary tower, a transformer shed, and a concrete structure. To assess potential impacts from these structures, surface soil samples were collected at a total of seven locations as were one chip sample and four wipe samples from the transformer shed. Two of the seven soil samples (1.1 ppm in the floor of the shed and 5.5 ppm along the east side of the shed, i.e., beneath the catenary tower) exceeded the PCB surface soil RSCO of 1 ppm. The chip and wipe sample results were below EPA criteria.

CONTAMINATED MATERIALS INVESTIGATION

Soil samples were collected for laboratory analysis from nineteen sampling locations across the project site from March 2005 to May 2005. Samples collected from each of the nineteen locations contained at least one type of contaminant (SVOCs, VOCs, PCBs, or Metals) at levels that exceed either STARS or RSCO guidance values; and therefore, any soils disturbed along the project site during construction should be considered as potentially contaminated. Excluding samples collected from the Apex Auto site and the Marshall Property site, the levels of SVOCs detected across most of the project site are indicative of urban fill material commonly found in New York City, and not likely associated with onsite sources of contamination. With the exception of sample location B-7 at the Apex Auto site, soils across the site did not exhibit hazardous waste characteristics based on TCLP analysis. TCLP testing on sample B-7 at Apex Auto resulted in a lead concentration of 9.14 milligrams per liter (mg/l), which exceeds the RCRA hazardous waste level for lead of 5.0 mg/l.

Fifteen soil samples were collected on February 23, 2006 from seven soil borings advanced on the Apex Auto site in the vicinity of former boring B-7 to better define the extent of the hazardous lead impacted soil. The seven borings were advanced to 12 feet below grade or bedrock, whichever occurred first. Bedrock was encountered at depths ranging from approximately 6 feet to greater than 12 feet below grade. Samples were analyzed for RCRA metals, TCLP RCRA metals, PCBs, Semi-Volatile Organic Compounds / Base Neutrals (SVOCs/BNs), and Volatile Organic Compounds (VOCs). Various metals, including lead, were detected at concentrations above RSCO values in soil samples from each boring location. Total lead was detected at concentrations ranging from 122 mg/kg to 3,010 mg/kg. TCLP lead was detected in the samples at concentrations exceeding the RCRA hazardous waste limit ranging from 6.69 mg/l to 26.6 mg/l. No additional metals were detected above their respective hazardous waste limits. VOCs and SVOCs were also detected in February 2006 above their respective reference values at each of the seven boring locations. PCBs were detected just slightly above the RSCO for PCBs of 1.0 mg/kg in samples collected from Apex Auto at five of the seven boring locations at concentrations ranging from 1.1 mg/kg to 2.9 mg/kg. Detailed findings of the contaminated material investigations are available in the Contaminated Material Investigation Report, Bronx River Greenway from Westchester Avenue to East Tremont Avenue, June 2005, EPM, Inc., and the Final Environmental Investigation Findings Report, Apex Auto Site, July 2006, EPM, Inc.

STARLIGHT PARK

Soil samples were collected for laboratory analysis from Starlight Park over the period 2002 to 2004 by GEI Consultants, Inc. during a remedial investigation at the Starlight Park site on behalf of the Consolidated Edison Company of New York (Con Edison), the detailed results of which

are reported in the *Focused Remedial Investigation, East 173rd Street Works, Bronx, New York, April 24, 2003*; and the *Supplemental Remedial Investigation, East 173rd Street Works (Starlight Park) Operable Unit No. 2, February 11, 2005*. The Starlight Park site is the location of a former Manufactured Gas Plant (MGP) and is listed as an Inactive Hazardous Waste Disposal Site by the NYSDEC for having contaminated soils, sediment, and groundwater resulting from the former MGP operation.

During the remedial investigation, soils samples were collected from soil borings and test pits located in close proximity to the proposed Bronx River Greenway improvements. Sampling of shallow soils (up to 20 feet below grade) in this area did not reveal significant levels of contamination. However, deeper soils in this area, as well as soils located adjacent to the north of the Bronx River Greenway project were found to be significantly contaminated with SVOCs, VOCs, and metals. Soil samples were collected from the Starlight Park site during the March – May 2005 Contaminated Materials Investigation from boring B-31, located at the proposed location of the new bridge touchdown on Starlight Park. The soil sample collected from B-31 contained relatively low levels of several SVOCs, and one metal (Mercury) above regulatory reference values. The former manufactured gas plant operation on Starlight Park was located north of the proposed Bronx River Greenway site, therefore significant contamination on the Starlight site appears to be located to the north of the proposed limits of excavation for the project. The remediation work in Starlight Park is the responsibility of Con Edison, and is being performed by Con Edison under the supervision of the NYSDEC.

BRONX RIVER SEDIMENT QUALITY

Sediment samples were collected for laboratory analysis from the Bronx River by GEI Consultants, Inc. during the remedial investigation at the Starlight Park. Analysis on the river sediment samples collected in the immediate vicinity of the proposed boat dock indicated the presence of various metals and SVOCs above regulatory reference values.

ASBESTOS

The greatest potential for exposure to any site contamination would occur during demolition of existing structures associated with the development of the Greenway. A survey for the presence of asbestos containing materials (ACMs) in association with the Bronx River Greenway Project was conducted for NYSDOT. The asbestos surveys included the Apex Auto parcel at 1235 Bronx River Avenue, the New York City Marshall Impound Lot property at 1363 Westchester Avenue, and ten structures located within the project corridor limits between East 172nd Street and East 177th Street that could be affected by construction activities.

The purpose of the asbestos survey was to identify the nature, location, quantity and asbestos content of all materials suspected of containing asbestos (greater than 1% as measured by Polarized Light Microscopy (PLM), and Transmission Electron Microscopy (TEM) as applicable) in accordance with New York State Industrial Code Rule 56.

A total of 385 asbestos bulk samples were collected from the project area and submitted for laboratory analysis of asbestos content. Out of the 343 bulk samples, 214 samples have been demonstrated by laboratory analysis to contain >1% asbestos by weight, and are therefore defined as asbestos containing materials (ACMs).

The types of asbestos containing materials identified included: plasters, window glazing, floor tiles and mastic, door insulation, roofing, flashing, coping stone and parapet wall mastic, and

various electrical equipment components, mainly at the structures of Apex Auto and the New York City Marshall Impound Lot.

D. PROBABLE IMPACTS

NO ACTION

This analysis assumes that without the Proposed Project, remediation of Starlight Park will be completed. The park could then be constructed by NYCDPR and opened to the public. The other sites would continue in their current usage. Currently, there are no known significant health or environmental risks associated with these uses. Likewise, there would be no significant risks in the future without the project. Sampling of sediments in the mudflat areas in the vicinity of the proposed dredging for the floating docks will also be performed.

PROPOSED PROJECT

The greatest potential for exposure to any site contamination would occur during demolition of existing structures and during any soil disturbance associated with development of the Greenway. Samples collected from each of the twenty-six locations contained at least one type of contaminant (SVOCs, VOCs, PCBs, or Metals) at levels that exceed either STARS or RSCO guidance values; and therefore, any soils disturbed along the project site during construction should be considered as potentially contaminated. With the exception of the Apex Auto site, soils across the site did not exhibit hazardous waste characteristics based on TCLP analysis. However, the RCRA hazardous waste level for lead was exceeded in several samples collected from the southwest region of the Apex Auto site. Soils to be excavated in this area should be considered as potentially contaminated and hazardous. It is possible that other areas of significant contamination exist on the Apex site in areas not accessible for sampling due to surface obstructions and daily operations. The final contract documents, which will be prepared during final design of the project, will include provisions for the testing of the potentially hazardous or contaminated areas that were inaccessible during the design phase. This testing will occur during the construction phase of the project, before any excavation work is done in these areas.

Prior to any demolition activities:

- Provisions will be made for the abatement of the identified asbestos containing materials in the Contract Plans and Specifications, in accordance with the New York State Department of Labor (NYSDOL) Industrial Code Rule 56, as well as applicable local and federal regulations.
- Activities with the potential to disturb lead-based paint will be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62 - Lead Exposure in Construction).
- Disposal of PCB-containing or suspect PCB-containing items (including debris and building materials) will be in accordance with applicable federal, state and local requirements.
- During the final design of the project, provisions (including any special specifications, notes, drawings, and estimates) will be included in the contract documents to ensure that any contaminated and/or hazardous soil, sediments, and groundwater will be handled,

transported, and disposed of in accordance with all applicable federal, state, and local rules and regulations. The final design documents will include requirements for additional testing of soils at previously inaccessible areas at the Apex Auto site to confirm actual conditions prior to excavation of the material.

As part of the construction of the Greenway:

- A site-specific Environmental Health and Safety Plan (HASP) will be prepared and implemented to protect workers, the community and the river from impacts from known or potential contaminated soil, sediments or groundwater. The HASP will include procedures to: minimize the generation of dust (and both work zone and community dust monitoring); properly remove and dispose of contaminated soil and procedures to address contamination (including tanks, drums, etc.) unexpectedly encountered; and manage any groundwater, should dewatering be required.
- A Storm Water Pollution Prevention Plan (SWPPP), which is required for all construction projects exceeding one acre of disturbance, will be prepared to address measures to prevent adverse impacts to the river or area sewers. It will include detailed measures for erosion control and soil stockpile management.
- Areas identified with surface soil (top two feet below final grade) contamination will be addressed in one of the following ways: excavate and dispose of in accordance with applicable rules and regulations; fence to restrict Greenway user access; or cover with impervious surface (e.g., asphalt) or at least two feet of clean soil to eliminate future exposure pathways.

With these measures, no adverse impacts related to hazardous materials are expected to occur either during or following development of the Greenway. ✷

Chapter D-13: Energy

A. INTRODUCTION

This chapter describes the potential energy effects related to the construction and operation of the Bronx River Greenway.

B. EXISTING CONDITIONS

With the exception of the New York City Marshall Impound Lot (also referred to as PDJ Simone) and Apex Auto lot, little energy is currently used at the Project Site. Lighting exists that is associated with the roads and road intersections, and there is minimal lighting at Starlight Park. Energy is currently supplied to New York City by Con Edison.

C. PROBABLE IMPACTS

According to the New York State Department of Transportation (NYSDOT) *Draft Energy Analysis Guidelines for Project-Level Analysis*, November 2003, detailed energy analysis is generally not needed for small scale projects. The transportation modes to be used on the Proposed Project, a multi-use path for walking, running, skating, and cycling, will not be energy intensive. The Proposed Project will not result in an increase in motorized vehicle miles traveled (VMT). Energy supply was not identified as an issue during the scoping process. Further, the Proposed Project is not located in an area with energy problems and will not place excessive demands on local energy supplies. Therefore, a qualitative assessment of potential energy impacts was performed.

All new buildings and major reconstructions in New York State must meet the requirements of New York State Energy Conservation Construction Code. Adherence to this code makes building energy efficient and generally precludes significant adverse energy impacts. On June 10, 2001, Governor George Pataki issued Executive Order 111. This Executive Order requires that new building and major reconstruction undertaken by the State of New York must achieve energy efficiency that is 20 percent greater than that required by the Energy Conservation Construction Code. Future proposed buildings to be constructed include restrooms, a boathouse, and concessions stand will conform to these standards. Further, this building is likely to be occupied only seasonally, reducing annual energy usage.

Other energy uses on the Project Site will include lighting of the multi-use path, overlooks, amphitheater, boathouse, floating dock and fixed platform, and concessions area. Outdoor lighting will likely follow the same patterns as the local streetlights, coming on at dusk and turning off at dawn. Path lighting will utilize efficient New York City Lighting Standards fixtures and require minimal energy consumption.

As discussed in Chapter D-6, “Noise,” construction of the Bronx River Greenway is anticipated to provide a non-motorized transportation corridor with the potential to reduce local vehicle

trips. Reduced vehicle trips will result in reduced energy consumption. Further, street intersection improvements will be expected to improve the flow of traffic in the area and relieve congestion, reducing energy resources consumed by vehicles. Therefore, the Proposed Project will not be expected to result in adverse impacts to energy supply or usage in the project area. ✷

Chapter D-14: Visual Resources

A. INTRODUCTION

This chapter considers the Proposed Project's effects on the visual character of the Project Site and the surrounding area. Due to the inaccessibility of the shoreline and flanking development, pedestrian views of the Bronx River are primarily limited to the bridges that cross the river. Therefore, the study area for visual resources has been defined as the area within 122 meters (400 feet) of the Project Site. This chapter assesses views of the proposed Greenway from surrounding locations and the multiple transportation corridors in the area that include I-895 (Arthur Sheridan Expressway) and I-95 (Cross Bronx Expressway), the AMTRAK Northeast Corridor line, and the elevated Nos. 2, 5, and 6 subway lines.

B. EXISTING CONDITIONS

PROJECT SITE AND SURROUNDING AREA

Extending for approximately one mile along the Bronx River between Westchester and East Tremont Avenues, the 10-hectare (HA) 25-acre Project Site passes through urban areas characterized by transportation corridors and a mix of residential and industrial buildings. The major transportation corridors include the AMTRAK Northeast Corridor rail line that runs along and over the Bronx River, the north-south Arthur Sheridan Expressway that runs adjacent to and near the west bank of the river, the east-west Cross Bronx Expressway that crosses over the northern portion of the Project Site, and the Nos. 2, 5, and 6 subway elevated lines.

In this primarily industrial and transportation-related corridor, most development abutting the Project Site and river consists of the AMTRAK Right-of-Way (ROW) and non-descript, low-rise industrial buildings housing auto-related uses. However, early-20th-century brick residential rowhouses and apartment buildings are located at the southeast and northeast corners of the Project Site. Moving east and west from the Project Site, streets of brick rowhouses, apartment buildings, and schools characterize the surrounding areas.

The Arthur Sheridan Expressway, the AMTRAK ROW, and abutting industrial development prevent pedestrian access to the river's immediate vicinity and block most views of the river. Since the area largely consists of low-rise buildings, there are long views over the river's open, wooded landscape. These views are of buildings in the distance on higher ground, tall modern apartment buildings outside the study area, bridges and viaducts crossing the river, and transmission pylons along the AMTRAK ROW.

The following discussion provides more detailed descriptions of the visual character of the Project Site segments and surrounding areas.

WESTCHESTER AVENUE TO EAST 172ND STREET

Between Westchester Avenue and East 172nd Street, the Bronx River is located at a lower elevation than the flanking urban areas that are largely defined by transportation and industrial uses. South of Westchester Avenue, the river banks are sloped and covered in vegetation, with the shoreline consisting of a mix of rock, retaining walls, and riprap. Partially collapsing wood fishing piers are located on the west bank, as is an abandoned cement plant outside the study area.

The AMTRAK Northeast Corridor rail line (formerly the New York, New Haven & Hartford Rail Road) runs parallel to the river along the west bank at a higher elevation. The AMTRAK ROW is bordered by various fence types, and it contains numerous tall steel pylons carrying electrical transmission lines. An abandoned station is located over the rail line at the intersection of Westchester and Whitlock Avenues. Approximately 500 feet north of Westchester Avenue, the rail line crosses the river on a bascule bridge to run north-south along the river's east bank. At the location of the bridge are two tall transmission towers composed of double pylons. The river bank around the AMTRAK bridge consists of tall, stone retaining walls with timber facing, and some stretches of mudflats. At this location, paved auto yards and warehouses are built to the edge of the retaining walls that form the river's edges, creating a canyon-like effect.

South of Westchester Avenue, the Arthur Sheridan Expressway runs parallel to the AMTRAK ROW at the same elevation. It passes under Westchester Avenue and then rises to the elevation of the surrounding streets. An exit ramp from the expressway connects to the avenue in front of the abandoned station. From a roughly north-south alignment, Westchester Avenue crosses over the river on a beam and girder bridge bordered by railings and chain link fencing. The elevated IRT No. 6 subway runs above Westchester Avenue, with footings in the street bed, and crosses over the ROW with a Pratt truss bridge and over the river with a Parker truss bridge.

The neighborhood on the west side of the river between Westchester Avenue and East 172nd Street is developed with a mix of residential buildings, schools, and auto-related industrial buildings. In the vicinity of Westchester Avenue, the street grid consists of streets intersecting at various angles, creating irregularly shaped blocks. The elevated subway is a dominant presence amidst the mix of mid-rise brick apartment buildings from the early 20th century, carwashes, and non-descript one-story commercial structures. Most buildings at the intersection of Westchester Avenue and Home Street house auto-related businesses.

The Arthur Sheridan Expressway creates a physical and visual barrier between the river and the neighborhood to the west between Westchester Avenue and the Cross Bronx Expressway six blocks to the north. Tall metal streetlights are located along the expressway, which is bordered with metal railings on both sides. The narrow strip of land between the expressway and the river is developed with auto-related warehouses and junk yards. These buildings and paved lots are built directly on the stone retaining walls that form the river's edge. The neighborhood to the west of the expressway contains several seven-story, early 20th-century brick apartment buildings, a paved playground overlooking the expressway, and several schools at Jennings Street. I.S. 84 is a modernist, circular five-story stone building with strip windows set in a paved parking lot. Across Jennings Street to the north is the five-story, U-shaped brick English Gothic-style P.S. 66. From Jennings Street, West Farms Road runs north-south parallel to the Arthur Sheridan Expressway. It contains street trees and is lined by a mix of non-descript, one-story industrial buildings and scattered rowhouses from the late 19th or early 20th centuries, which have been altered with modern synthetic siding. The topography rises sharply upward on schist outcroppings between West Farms Road and Boone Avenue to the west.

The neighborhood on the east side of the river between Westchester Avenue and East 172nd Street is primarily residential. In this area, the AMTRAK ROW runs along the river. Bronx River Avenue is the major north-south thoroughfare, and it is a wide, four-lane north-south road with wide sidewalks. Under the shadow of the elevated subway line, the intersection of Westchester and Bronx River Avenues is defined by non-descript, one-story gas stations, carwashes, and auto parts stores that are all set within paved parking lots. Several tall signs are located in the parking lots around the intersection. To the south, Bronx River Avenue is lined by similar, non-descript one-story auto-related buildings.

North of Westchester Avenue, the visual character of the area on the east side of the river changes. Attached two-story, two-family houses line both sides of Bronx River Avenue. The buildings on the avenue's west side abut the Apex Auto property—a paved yard that occupies the narrow space between the AMTRAK ROW and the houses—with small yards enclosed with walls. Built in the early 20th century, these buildings create a unified streetscape of modest brick houses decorated with brick paneling, inset cast stone ornament, and stepped parapets. They all have stoops, many have awnings, and the house pairs are separated by narrow driveways that lead to garages. Several of the houses have been reclad with modern synthetic siding. Street trees are located along the avenue, as are tall metal streetlights and wood utility poles. The entrance to Apex Auto is through a driveway marked by signage at the southern end of the avenue. The auto yard entrance only slightly breaks the residential streetscape. At East 172nd Street, several buildings contain ground-floor storefronts.

The only pedestrian views of the Bronx River and the Project Site between Westchester Avenue and East 172nd Street are obtainable from the Westchester Avenue bridge over the river. Abutting development along the river precludes other viewpoints. Motorists have only passing views from the avenue bridge. Riders on the No. 6 subway line and on the AMTRAK Northeast Corridor Line have more opportunities for river views, but they are passing views.

EAST 172ND STREET TO EAST 174TH STREET

East 172nd Street does not traverse the river. On the side east, East 172nd Street dead ends at a metal barricade and chain link fence above the AMTRAK ROW. Car parts are located at the dead end, and transmission pylons are prominent from the street. Tree growth within the ROW obscures views of the river. North of East 172nd Street, the neighborhood on the east side of the river is characterized by two-story brick, two-family houses that resemble those lining Bronx Park Avenue to the south. Street trees and wood utility poles runs along both sides of the avenue.

Starlight Park borders the west bank of the river between East 172nd and East 174th Streets. The park is currently a large construction site undergoing hazardous materials remediation. The dirt-covered property contains construction trailers and equipment, and it is bordered by chain link fencing. Access is currently blocked from the pedestrian ramps that lead down from the East 174th Street bridge. The Arthur Sheridan Expressway runs along Starlight Park creating a visual and physical barrier to the park and river from the neighborhood to the west. West Farms Road parallels the expressway and there is a planted median between the street and expressway, as well as a chain link fence and metal barricades. Non-descript brick garages of one and two stories line the west side of West Farms Road, where there is a wide sidewalk. There are also some paved parking lots. To the west of the road, the topography rises sharply—tall schist outcroppings emphasize the dramatic rise in elevation—and the neighborhood along Boone and Longfellow Avenues (outside the study area) consists of tall, early 20th-century brick apartment buildings and rowhouses.

The shoreline of the Bronx River between East 172nd and East 174th Streets consists of riprap with erosion netting. The river banks slope upward and are wooded. The East 172nd Street dead-end on the east side of the river affords the only pedestrian views of the river from this segment of the study area. The Arthur Sheridan Expressway (and the closed park) on the west side and residential development and the AMTRAK ROW on the east side prevent accessibility to the shoreline and block views. Motorists on the Arthur Sheridan Expressway have passing or no views of the river.

EAST 174TH STREET TO THE CROSS BRONX EXPRESSWAY

East 174th Street crosses the river on a Warren through-truss bridge with concrete footings and it crosses above the Arthur Sheridan Expressway and West Farms Road on a viaduct with steel columns. Pedestrian stairs lead to the bridge from West Farms Road and pedestrian ramps (currently closed) lead down from the bridge to the west bank of the river and Starlight Park. North of the bridge, there is a grassy area between the expressway and river that slopes down to the shoreline. Trees border the shoreline that consists of riprap.

An entrance/exit ramp between the Arthur Sheridan and Cross Bronx Expressways splits off to the northwest, and a mostly unlandscaped hill is located between the expressway and ramp. In this section of the study area, West Farms road is located at a slightly lower elevation than the expressway, and there is a grassy hill with some trees between the two. Early 20th-century houses covered in modern synthetic siding, non-descript one-story garages, two-story brick industrial buildings, and paved vehicular storage lots line the west side of West Farms Road.

On the east side of the river, there is a large, densely wooded area between the shoreline and the AMTRAK ROW. At East 174th Street, the rail line splits into two divergent paths. Numerous transmission pylons within the ROW are visible from Bronx River Avenue. The residential neighborhood of early 20th-century rowhouses ends at East 174th Street, and Bronx River Avenue becomes wider with a concrete median. To the north of the street, the New York City Marshall's Impound Lot (also referred to as PDJ Simone) occupies the land between the ROW and Bronx River Avenue. It is bordered by solid fencing and jersey barriers. North of the impound lot, a concrete plant is located along the ROW, and that property continues to the north under the Cross Bronx Expressway. Grassy medians and some large trees are located around the Cross Bronx Expressway. The Bronx River Houses—a mid-20th-century complex of nine cross-shaped, 14-story brick residential towers set in landscaped lawns—occupy a large site on the east side of the avenue.

The river is heavily wooded, especially on the east bank, between East 174th Street and the Cross Bronx Expressway. The shoreline consists of riprap. The only pedestrian views of the river are from the East 174th Street Bridge, which also provides passing views to motorists. Motorists on the Arthur Sheridan Expressway have extensive, but passing, views of the river because the expressway directly borders it. Riders on the AMTRAK Northeast Corridor Line also have river views.

CROSS BRONX EXPRESSWAY TO EAST TREMONT AVENUE

The east-west Cross Bronx Expressway traverses West Farms Road, the Arthur Sheridan Expressway, and Bronx River Avenue on steel girder bridges supported by masonry piers and retaining walls. Several tall billboards are located along the expressway in the vicinity of West Farms Road, which is bordered by tall stone walls as it runs beneath the expressway. The west side of the road is lined with the same mix of parking lots and brick garages and industrial

buildings that is found along its full alignment between the Cross Bronx Expressway and Westchester Avenue. P.S. 167 is located on the east side of the road. Also fronting on East Tremont Avenue, the school is a three-story modernist masonry building composed of largely windowless boxes set back from the surrounding streets and above the river. A paved playground bordered by a tall chain link fence is located on the south side of the school. A paved parking lot and loading area fronts on East Tremont Street. On the east side of the school, the grassy terrain is enclosed by a fence and planted with trees and flowers, and it slopes down to the river.

Northwest of the Project Site, the intersection of East Tremont Avenue, West Farms Road, and Boston Road is busy and chaotic and characterized by asphalt and masonry. East Tremont Avenue is a wide, four-lane road that runs east-west through the study area and crosses the Bronx River on a steel girder bridge supported by a stone pier in the river. The avenue has wide sidewalks and a concrete median. The Nos. 2 and 5 subway lines run north-south on a viaduct above Boston Road. The elevated subway is a dominant feature of the area. A one-story, full-block brick building with an open roof-top parking garage is located on the north side of the avenue between Boston Road and Bronx Street, a small road that provides access to the Bronx River Park (described below). Containing a supermarket and several storefront retail establishments, it is a late 20th-century building set far back from the street behind a wide sidewalk and parking lot. Two modern 21-story brick apartment buildings, located at the northwest corner of East Tremont Avenue and Boston Road, are visible for long distances to the south and east.

The East Tremont Avenue Bridge over the Bronx River is bordered by railings and chain link fencing, but it provides good views to the river below. On the north side of the bridge, a four-story, brick former loft building is located on the river bank. It contains the Bronx River Art Center. Between the art center and the supermarket, Bronx Street leads to the Bronx River Park. Underneath the elevated subway, the small park runs down to the river and contains trees, grassy lawns, rock outcroppings, and seating. The wooded shoreline on both sides of the river is natural in this location. The elevated subway places supports on both riverbanks. To the south, the Cross Bronx Expressway places a concrete pier in the river, as does the East 177th Street expressway ramp.

On the east side of the river, the area around the busy intersection of East Tremont Avenue, Devoe Avenue, Wyatt Street, and East 177th Street is developed with a mix of buildings. A modern boxy carwash occupies a large parcel on the north side of East Tremont Avenue between the river and Devoe Avenue. The east side of Devoe Avenue contains the Classical Revival-style West Farms Station post office and a blockfront of six-story early 20th-century apartment buildings with decorative brickwork, lightcourts, and ground-floor retail. On East Tremont Avenue and Wyatt Street, the area to the east is a mostly residential neighborhood of low-rise brick apartment buildings, tenements, and rowhouses from the early 20th century. Devoe Avenue contains a planted triangular median with a concrete bench. The east riverbank between East Tremont Avenue and the East 177th Street ramp to the Cross Bronx Expressway contains an overgrown paved parking lot, but it is also wooded. An MTA bus facility occupies a large parcel on the south side of East 177th Street between the river and the AMTRAK ROW. Bordered by a tall metal fence with masonry columns, the bus facility contains a large modernist boxy concrete building and paved parking lots for buses.

The only pedestrian views of the river from the section of the study area between the Cross Bronx Expressway and East Tremont Avenue are obtainable from the East Tremont Avenue

bridge. The northernmost portion of the Project Site itself is visible on Devoe Avenue. Pedestrian views from all other locations are blocked by intervening buildings and inaccessibility to the shoreline. Motorists on the Cross Bronx Expressway and the Arthur Sheridan Expressway have more extensive, although passing, views. Riders on the Nos. 2 and 5 subway lines have views as the subway crosses above the river. From the East Tremont Avenue/West Farms Square subway station, there are only limited views of the river.

VISUAL RESOURCES

The Bronx River is a visual resource in the study area, but pedestrians have highly circumscribed views of it. Pedestrian views are only obtainable from the small Bronx River Park that provides access to the shoreline and from the East Tremont Avenue, East 174th Street, and Westchester Avenue bridges over the river. The Arthur Sheridan Expressway provides more views of the river to motorists, and riders on the Nos. 2, 5, and 6 subway lines have views of the river as the subways cross above it. Further, riders on the AMTRAK Northeast Corridor Line also have views of the river.

Two additional visual resources include the East 174th Street Bridge and the elevated No. 6 subway bridge over the AMTRAK ROW and Bronx River. The Warren truss span of the East 174th Street bridge is visible for long distances north and south on West Farms Road. From the east side of the river, it is only visible from East 174th Street in the vicinity of the bridge. The bridge is also clearly visible to motorists on the Arthur Sheridan Expressway.

The Pratt and Parker truss spans of the No. 6 subway bridge are visible for long distances from the north on West Farms Road and on Bronx River Avenue. The truss spans are also visible from Westchester Avenue and the surrounding streets intersecting the avenue, as well as from the Arthur Sheridan Expressway.

VIEWER GROUPS AND DURATION OF VIEWS

As described above, pedestrians have only limited views of the Project Site and Bronx River. There are no streets open to pedestrians that abut the majority of the Project Site, and most views from the surrounding areas are blocked by intervening buildings, the Arthur Sheridan Expressway, and tree coverage within the AMTRAK ROW. From West Farms Road, there are some limited views over the Arthur Sheridan Expressway of the Starlight Park portion of the Project Site. The bridges over the river allow extensive views to pedestrians who often linger to look at the river. The East 174th Street Bridge, however, appears to experience extremely limited pedestrian traffic. In addition, the Bronx River Park provides shoreline access and seating for leisurely contemplation.

As the Arthur Sheridan Expressway directly borders the Project Site and river for most of their length, it provides clear views to motorists. However, passing by quickly, this viewer group has only brief viewing spans. Similarly, motorists on the Cross Bronx Expressway and the other bridges over the river have only limited, brief views. Riders on the elevated Nos. 2, 5, and 6 subway lines have some clear passing views of the river as they cross above it. Although the Nos. 2 and 5 lines run parallel to the Project Site outside the study area to the west, there are no views from the subway due to intervening buildings, except from the immediate vicinity of the East Tremont Avenue/West Farms Square Station and then from the bridge over the river. Riders on the AMTRAK Northeast Corridor Line have clear but passing views of the Project Site and Bronx River.

C. PROBABLE IMPACTS

NO ACTION

The remediation of Starlight Park has turned the park into a large construction site. Previous access to the park and the river bank from the East 174th Street Bridge is currently blocked. Due to the construction activities in the park, the immediate setting of the river is visually compromised, but the park is only visible to pedestrians from the East 174th Street bridge, and partially from West Farms Road over the Arthur Sheridan Expressway.

No other projects are under construction or planned for completion within the 122-meter (400-foot) visual resources study area by the project build year.

PROPOSED PROJECT

Overall, it is not expected that the Proposed Project will have adverse effects on visual resources. The project's goal is to enhance the Bronx River's natural qualities, thereby enhancing the visual character of the surrounding areas and visual resources, increase public access to the river, and provide a new open space and visual resource.

CONSTRUCTION

It is possible that construction of the Proposed Project could result in temporary, adverse indirect effects to the visual character of the Project Site and surrounding area and to the context or visual setting of the visual resources in the study area. However, any such effects will only be temporary during the construction period (e.g., construction vehicles, denuded site clear of landscaping, etc.). Further, views of construction activities and any adversely effected visual settings will not be visible from most locations in the surrounding area. As described above, pedestrians have only circumscribed views of the Project Site from the bridges over it and from a small section of Devoe Avenue, and motorists and subway/train riders have passing views of brief duration.

Construction in Starlight Park will be visible from the surrounding area. However, Starlight Park is currently a construction site and is expected to remain so under the No Action Alternative. Therefore, there will be no change to the visual character of that section of the Project Site and the surrounding area during the construction period of the Proposed Project.

OPERATION

While the Proposed Project will dramatically alter the visual character of the Project Site and the visual setting of the Bronx River by transforming the Project Site into a landscaped open space, it is not expected to have adverse effects on visual resources or on the visual character of the Project Site and surrounding areas, which will, in fact, be enhanced by the Proposed Project.

Existing industrial buildings, paved areas, and retaining walls abutting the southern segment of the Project Site will be removed and remaining undeveloped areas on the river banks north of the AMTRAK bridge will landscaped. Naturalized shorelines will be created, and the entire Project Site—defined by a mix of industrial sites, wooded areas, and the adjacent AMTRAK ROW—will become a landscaped park with footpaths, four pedestrian bridges, stone outlooks and a viewing platform, basketball courts and a playing field at Starlight Park, natural vegetation and mudflats, a boat house and pier, and an amphitheater. In addition, an existing bridge

abutment will be retained. A potential spring in the segment between East 174th Street and the Cross Bronx Expressway will also be retained if determined to be from a natural source. For a more completed description of the Proposed Project components, see Chapter D-1, "Project Description." See Appendix G for illustrative renderings of the Proposed Project.

Although the landscaped and developed Greenway will be a dramatic contrast to the existing visual character of the site and river, the project aims to enhance the river's setting and natural qualities. Significantly, the Greenway will bring people to the currently inaccessible river, which will become a defining visual resource in the area. The recreational and other built features will be designed to blend with the recreated natural shorelines, newly planted native vegetation, and retained woodlands. The pedestrian bridges—designed in a variety of truss forms, and potentially including a suspension bridge—will be in keeping with the area where numerous bridge types cross the Bronx River.

Further, the Proposed Project will enhance the settings of the visual resources in the study area—the Bronx River itself, the East 174th Street bridge, and the No. 6 subway bridge. It will also create new visual resources in the Greenway and the new pedestrian bridges. As existing truss bridges in the area are visual resources, the new truss bridges will be also.

The viewer group most affected by the Proposed Project will be the new viewer group of Greenway patrons created by the project. Since the river is currently inaccessible except to the occasional canoeist and since most pedestrian views of it are blocked from the surrounding areas, visual changes to the site and river will not be apparent from most locations in the study area. For the most part, there are no views of the Project Site from the neighborhoods on the east side of the river, and there will be no views of the Greenway except in the vicinity of Devoe Avenue. Pedestrian views from the neighborhoods west of the river will be largely limited to the area around Starlight Park. The bridges crossing the river will provide the best views of the Greenway for pedestrians. Motorists on the bridges and the Arthur Sheridan Expressway and subway/train riders will have clear, but passing, views of the Greenway. For these viewer groups, including the park patrons, it is expected that the natural and landscaped Greenway will be a visually pleasing enhancement of the Bronx River and the surrounding areas. ✷

Chapter D-15: Secondary and Cumulative Impacts

A. INTRODUCTION

This chapter evaluates secondary and cumulative effects of the project as required under the National Environmental Policy Act (NEPA). Secondary impacts are those that are "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR 1508.8). Generally, these impacts are induced directly or indirectly by the Proposed Project. Secondary effects can occur within the full range of impact types, such as changes in land use; economic vitality; neighborhood character; traffic congestion, with its associated effects on air quality and noise, water resources; and other natural resources.

Cumulative impacts result from the incremental consequences of an action (e.g., the project) when added to other past and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative effects of an action may be undetectable when viewed in the individual context of direct and even secondary impacts, but nevertheless when added to other actions can eventually lead to a measurable environmental change.

B. SECONDARY IMPACTS

The Proposed Project would comprise approximately 10 hectares (HA) (25 acres) of parkland and open space including the Greenway and Starlight Park, and will feature a continuous multi use path along its one-mile length. The project will replace vacant and publicly inaccessible areas along the Bronx River with transportation, recreation, and maritime facilities, as well as new and enhanced ecological features. The Bronx River Greenway will create a minimal increase in pressure for development on the adjacent and surrounding properties correlating to increased pedestrian amenities and improved access.

The Bronx River Greenway will help improve the quality of the environment in the study area and may make it more attractive for development. However, any induced economic development growth would be consistent with the goals of Community District 3's 197-a Plan, "Partnership for the Future: a 197-a Plan for the Revitalization of Community District 3" in 1993, which include the following:

(1) Re-establish the district as a dynamic, viable community;

(2) increase the district's population to 100,000 by the year 2000;

(3) provide a viable economic base through the provision of job training and the creation of labor intensive opportunities;

(4) Maintain, develop, and expand the district's supporting infrastructure; and

(5) Maintain parks and recreation areas throughout the district.

Construction and maintenance activities occurring during Greenway construction, especially construction of the new bridges, will provide additional economic growth-inducing incentives

for companies in the area and the region. These economic opportunities are spurred by the increased demand that would be created by the Proposed Project's construction and operation, for labor, supplies, equipment, and goods.

For these reasons, there are not expected to be adverse secondary environmental effects from induced growth resulting from the project, either on a regional or local level.

C. CUMULATIVE EFFECTS

An analysis of cumulative impacts considers resources, ecosystems, and human communities that could be potentially affected by the action and whether those could also be affected cumulatively by the Proposed Project in combination with other reasonably foreseeable actions. To this end, this Environmental Assessment (EA) considers as the future baseline condition, or No Action Alternative, the combination of existing conditions together with known development plans, public policies, projected population and employment growth, and other general background growth. The No Action Alternative projects have been assessed in combination with the Proposed Project in Chapters D-2 through D-14 for a range of technical areas.

The following projects were considered in the No Action Alternative analyses:

- MBD New Horizons Retail Center
- Construction on Freeman Street between Bryant and Longfellow Avenues
- Construction activities on I-895 (Arthur Sheridan Expressway)
- The New York City Department of Parks and Recreation (NYCDPR)'s planned park at the former concrete plant site south of the Proposed Project
- NYCDPR's West Farms segment of the Bronx River Greenway

Two projects being considered within the vicinity of the Proposed Project were not included in the future baseline conditions because they are in the early stages of development and specific information (such as a preferred alternative) is not available to analyze their potential cumulative effects with the Bronx River Greenway. These major projects are considered to have regional cumulative effects:

- NYSDOT is conducting the Bronx Arterial Needs MIS, a study that will focus on improving I-95 (Cross Bronx Expressway) and I-87 (Major Deegan Expressway).
- Reconstruction of the interchange of NYSDOT's Bruckner-Sheridan Expressway project.

Most of the future projects' areas of potential effect would not overlap with the Proposed Project's adverse impacts. With respect to the Proposed Project's major direct construction effects the areas of concern include contaminated materials, water quality, and natural resources. While the project's proposed mitigation would avoid any significant adverse effects with respect to contaminated materials, the impacts to natural resources would lead to a loss of habitat that could result in cumulative adverse effects if not replaced. The most significant adverse effects would accrue from the loss of wetlands and impacts to water quality due to potential dredging activities. Because of the importance of these resources, and to avoid adverse cumulative effects of other projects which may also fill wetlands or alter terrestrial habitat, it is anticipated that the Bronx River Greenway will not only mitigate for the loss of wetlands, but create additional wetlands to enhance habitat. The project will also remove non-native vegetation and plant native trees, shrubs, and grasses. In its entirety, the Bronx River Greenway Corridor will not only provide a continuous transportation corridor, but will also provide a green corridor for wildlife.

Removal of impervious surface and improvements to drainage infrastructure along the corridor will also improve water quality of the Bronx River, and thus improve aquatic habitat.

Another direct adverse effect of the Proposed Project would be the displacement of four industrial entities (mostly auto-related) and replacing them with a multi-use path and park space. These businesses are not water dependent, and do not contribute substantially to a defining element of the neighborhood's land use or character. As mentioned earlier, the Proposed Project is one of many segments that would ultimately result in a continuous greenway that runs from Westchester County to the East River; therefore, the four industrial properties on the Project Site are an important link within this segment. With respect to cumulative effects, an area of concern is the continued loss of manufacturing space in New York City. While the project would require the displacement of these businesses and the acquisition of two of these properties as discussed previously in Chapter D-4, "Economic Conditions," vacant industrial buildings and land are available in the area for relocation of the displaced businesses. Therefore, with respect to economic conditions, the displacement of the businesses for the construction of the Greenway would not lead to increased adverse secondary or cumulative effects. ✷

Attachment 1: Water Quality, Floodplains, and Natural Resources Regulations

A. INTRODUCTION

The following sections describe laws and regulatory programs that may be applicable to activities proposed as part of the Proposed Project. Because some of the state laws and regulatory programs were promulgated under authority of federal laws, the federal laws and regulatory programs are discussed first in the following sections.

B. SURFACE WATER QUALITY AND FLOODPLAINS

FEDERAL REGULATIONS

THE 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 non-point source pollution such as runoff from streets, agricultural fields, construction sites and mining that enter waterbodies, from other than the end of a pipe. Section 402 of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) which governs the review and issuance of permits for the discharge of pollutants to surface waters. Section 402 also allows the United States Environmental Protection Agency (USEPA) to delegate authority to states to carry out the NPDES program once they have met the specified requirements. New York has been delegated authority to implement NPDES, which it does through the State Pollutant Discharge Elimination System (SPDES), as discussed below in the section on New York regulations.

Section 404 of the Clean Water Act, requires authorization from the Secretary of the Army, acting through the United States Army Corps of Engineers (USACOE), for the discharge of dredged or fill material into navigable waters and other waters of the United States. Waters of the United States is defined in 33 CFR 328.3 and includes wetlands, mudflats, and sandflats that meet the specified requirements in addition to streams and rivers that meet the specified requirements. Section 404 applies to both permanent and temporary fill that would be discharged into waters of the United States within the project study area. Issuance of a Section 404 by the USACOE requires that a Water Quality Certificate be issued by the state where the discharge occurs to acknowledge that the discharge will not cause state water quality standards to be violated.

In addition, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge will occur or from an interstate water pollution control

agency, that the discharge will comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. Applicants for discharges to navigable waters in New York must obtain a Water Quality Certificate from the New York State Department of Environmental Conservation (NYSDEC).

RIVERS AND HARBORS ACT OF 1899

Section 10 of the Rivers and Harbor Act of 1899, requires authorization from the Secretary of the Army, acting through the USACOE, for the construction of any structure in or over any navigable water of the United States, the excavation from or deposition of material in these waters, or any obstruction or alteration in navigable water of the United States. The purpose of this Act is to protect navigation and navigable channels. Any structures placed in navigable waters such as pilings, piers, or bridge abutments up to the mean high water line would be regulated pursuant to this Act. The USACOE must evaluate the probable impacts including cumulative impacts of the proposed activity on the public interest (benefits of the proposed activity versus potential detriments).

EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT (SECTION 6)

The US Department of Housing and Urban Development, in conjunction with Executive Order 11988, defines the term floodplain to mean "*lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year*." Executive order 11988 states that, "e*ach 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.*"

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.

STATE REGULATIONS

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

New York State's surface waters (rivers, streams, lakes, and ponds) are valuable for sources of drinking water, for bathing, agricultural, commercial, and industrial uses, for the fish and wildlife habitat they provide, and for educational and recreational opportunities. It is the State's policy, as set forth in Title 5 of Article 15, ECL to preserve and protect these waters. NYSDEC is responsible for administering the Protection of Waters regulations to prevent undesirable activities on waterbodies. Under this regulatory program, all waters of the state are provided a use classification (A or AA for drinking water source, B for best usage for swimming and other contact recreation, C for waters supporting fisheries and non-contact recreation, and D the

lowest use classification), and a standard designation based on existing or expected best usage (such as T for those that may support trout, or TS for those that may support trout spawning).

Streams and small waterbodies connected to streams that are designated as C(T) or higher (i.e., C(TS), B, or A) are protected streams that are subject to the stream protection provisions of the Protection of Waters regulations. 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 navigable waters and their adjacent and contiguous wetlands; and Water Quality Certification for placing fill or other activities that result in a discharge to waters of the United States in accordance with Section 401 of the Clean Water Act.

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES), ARTICLE 17 TITLE 8, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PARTS 750, 751, 752, 753, 754, 755, 756, 757.

Title 8 of Article 17, ECL, Water Pollution Control, was enacted to protect and maintain surface and groundwater resources and authorized the creation of the State Pollutant Discharge Elimination System (SPDES) to regulate discharges to the state's waters. The following activities require SPDES permits: constructing or using an outlet or discharge pipe (point source) that discharges wastewater into surface or groundwaters of the State; constructing or operating a disposal system (sewage treatment plant); or discharge of stormwater. Construction activities that disturb one acre or more must obtain an SPDES permit.

FLOOD PLAIN MANAGEMENT CRITERIA FOR STATE PROJECTS (6 NYCRR 502)

New York State's Department of Environmental Conservation (NYSDEC) Environmental Conservation Law regulations require that, 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. The Bronx River is the only regulatory floodway in New York City. NYSDEC regulations also require state agencies to consider alternative sites for a project that are located outside the floodplain. State projects in the 100-year floodplain must be constructed to minimize flood damage. No project may be undertaken unless it is demonstrated that the cumulative effect of the proposed project, when combined with all existing development, will not cause any material damage to such existing development. In addition, 6 NYCRR 502 contains requirements for new and replacement water supply and sanitary sewage systems.

C. NATURAL RESOURCES

FEDERAL REGULATIONS

EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS (42 FEDERAL REGISTER 26961, 25 MAY 1977)

This Executive Order directs federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance wetland quality. New activities in wetlands, either undertaken or supported by a federal agency, are to be avoided unless there is no practicable alternative and all practical measures have been taken to minimize the potential impacts to the wetlands.

MAGNUSON-STEVENS ACT (16 USC §§ 1801 TO 1883)

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for the NMFS and the Regional Fishery Management Councils (in this case, the Mid-Atlantic Fishery Management Council) to comment on activities proposed by federal agencies (issuing permits or funding projects) that may adversely impact areas designated as essential fish habitat (EFH). EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802(10)).

ENDANGERED SPECIES ACT OF 1973 (PL 93-205; 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 Act prohibits the importation, exportation, take, 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. USFWS (non-marine plants and animals) and 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.

MIGRATORY BIRD TREATY ACT (16 USC §§703 TO 712)

The Migratory Bird Treaty Act implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. Each of the treaties protects selected species of birds and specifies basic closed and open seasons for hunting game birds. The Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13) lists the bird species protected under the Act.

EXECUTIVE ORDER 13186 OF JANUARY 10, 2001, RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS

This Executive Order directs federal agencies to take certain actions to further implement the Migratory Bird Treaty Act. Each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement a Memorandum of Understanding (MOU) with USFWS that promotes the conservation of migratory bird populations. Agencies are expected to avoid or minimize impacts to migratory bird populations, and to take reasonable steps that include restoring and enhancing habitat, preventing or abating pollution affecting birds, and incorporating migratory bird conservation into agency planning processes whenever possible.

STATE REGULATIONS

TIDAL WETLANDS ACT, ARTICLE 25, ECL, 6NYCRR PART 661

Tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis. They are found along much of the salt-water shore, bays, inlets, canals, and

estuaries of Long Island, New York City and Westchester County. Tidal wetlands are valuable for marine food production, wildlife habitat, flood, hurricane, and storm control, recreation, absorption of silt and organic material, education and research opportunities, and aesthetic values. The Tidal Wetlands Act sets forth the state's policy that tidal wetlands should be preserved and protected. NYSDEC is responsible for administering the tidal wetlands regulatory program (6 NYCRRR Part 661) and mapping the locations of New York'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 (up to 300 feet inland from wetland boundary, or up to 150 feet inland within New York City) to wetlands falling under that category. A permit is required for almost any activity that will alter wetlands or the adjacent areas.

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. ✷

A. INTRODUCTION

Essential fish habitat (EFH) is defined under the Magnuson-Stevens Fishery Conservation Management Act (16 USC §§ 1801 to 1883), as amended by the Sustainable Fisheries Act (SFA) of 1996, as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." "Waters" include aquatic areas and their physical, chemical and biological properties that are used by fish. "Substrate" includes sediment, hard bottom, structures, and associated biological communities that are under the water column. Waters and substrates necessary for fish spawning, breeding, feeding or growth to maturity—covering all stages within the life cycle of a particular species—refers to those habitats required to support a sustainable fishery and a particular species' contribution to a healthy ecosystem (50 Code of Federal Regulations (CFR) 600.10).

Section 303(a)(7) of the Magnuson-Stevens Act requires that the eight Regional Fishery Management Councils (RFMC) describe and identify EFH for each federally managed species, and minimize adverse impacts from fishing activities on EFH. Section 305(b) (2)-(4) of the Magnuson-Stevens Act outlines the process for providing the National Marine Fisheries Service (NMFS) within the National Oceanic and Atmospheric Administration (NOAA), and the RFMC with the opportunity to comment on activities proposed by federal agencies that have the potential to adversely impact EFH areas. Federal agencies are required to consult with NMFS (using existing consultation processes for NEPA, the Endangered Species Act, or the Fish and Wildlife Coordination Act) on any action that they authorize, fund, or undertake that may adversely impact EFH.

Adverse effects to EFH, as defined in 50 CFR 600.910(A) include any impact that reduces the quality and/or quantity of EFH. Adverse effects may include:

- Direct impacts such as physical disruption or the release of contaminants;
- Indirect impacts such as the loss of prey, reduction in the fecundity (number of offspring produced) of a managed species; and
- Site-specific or habitat-wide impacts that may include individual, cumulative or synergetic consequences of a Federal action.

An EFH assessment of a federal action that may adversely affect EFH must contain:

- A description of the proposed action;
- An analysis of the effects, including cumulative, on EFH, the managed species and associated species such as major prey species, and the life history stages that may be affected;

- The agency's conclusions regarding the effects of the action on EFH; and
- Proposed mitigation if applicable (50 CFR 600.920(g)).

B. PROJECT DESCRIPTION

The Proposed Project is part of the Bronx River Greenway corridor that extends from the East River to the border of New York City with Westchester County. The Proposed Project consists of the Bronx River Greenway segment from Westchester Avenue to East Tremont Avenue and comprises a multi-use path for people to walk, bicycle, skate, or run for transportation, recreation, or exercise. Components of the project include:

- Construction of three pedestrian bridges over the Bronx River;
- Construction of a pedestrian bridge over the AMTRAK Northeast Corridor Line;
- Construction of the multi-use path;
- Parkland improvements such as lighting, control of non-native and invasive species, and planting with native species;
- Extension and improvements to the CSO located at East 177th Street;
- Conversion of 3.33 acres of paved areas to green space;
- Naturalization of shorelines with planting of native wetland species, where feasible;
- Development of Starlight Park into an active recreation area with playfields, grassy areas, a boat house, and a fixed platform and floating dock for small watercraft such as canoes and kayaks;
- Improvements to 3 major road intersections with provision of pedestrian crossings and landscaping; and
- Improvements to reduce direct discharges of stormwater runoff to the Bronx River.

SITE DESCRIPTION

WATER QUALITY OVERVIEW

The Proposed Project is located on the lower Bronx River, a tributary to the Upper East River and part of the New York Harbor Estuary. The Bronx River is tidally influenced within the Project Site. The head of the tide occurs at a dam at the southern end of Bronx Park approximately one-quarter mile north of the northern end of the Project Site (East Tremont Avenue). Freshwater flows range from approximately 5 to 10 cubic feet per second (cfs) during dry conditions and from approximately 20 to 70 cfs during wet conditions NYCDEP (2002). Salinity near the confluence with the East River generally ranges from approximately 15 to 32 ppt, with an average of about 25 ppt (NYCDEP 2004). Salinity recorded within the Project Site near East Tremont Avenue north of the weir located just north of East 172nd Street is much lower, between 0 and 2.5 ppt (Rachlin Pers. Comm. 2004).

The NYSDEC classifies the lower Bronx River as Use Class I. The best usages for Class I saline surface waters are as secondary contact recreation and fishing. These waters must be suitable for fish propagation and survival. The water quality of the New York Harbor Estuary and its

tributaries such as the Bronx River 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. The construction and upgrading of wastewater treatment facilities (WWTF), and implementation of water pollution control programs that have occurred within the New York Harbor since the 1970s has greatly reduced nutrient inputs and improved water quality (Brosnan and O'Shea 1995). Despite these overall improvements in water quality of the Harbor, the water quality of the lower Bronx River is impaired due to pathogen concentrations and oxygen demand (NYSDEC 2002 303d list and 2004 draft 303d list).

Average fecal coliform concentrations for the Upper East River/Western Long Island Sound area, which includes the lower Bronx River, showed a dramatic decline from the 1970s, dropping from more than 2,000 cells per 100 milliliters (cells/100 mL) to around 50 cells/100 mL in recent years, below the standard for Use Class I. This decline is attributed to the construction and upgrading of WWTF, and the city's water pollution control programs (NYCDEP 2003). The closest monitoring station for the NYCDEP Harbor Survey is located near the mouth of the Bronx River. Fecal coliform measurements taken between 1999 and 2003 at the Bronx River sampling station ranged from 1 to 1,940 cells/100 mL and averaged 205 cells/100 mL in top waters, never exceeding the Class I criteria.

DO measurements taken between 1999 and 2003 at the Bronx River sampling station ranged from 3.4 to 14.3 mg/L for surface waters, and averaged 6.3 mg/L. Bottom water DO concentrations were generally slightly lower than surface water concentrations, but were usually above the 4.0 milligram per liter (mg/L) standard (NYCDEP 2004). DO has the potential to drop below the standard during periods in the summer. A similar pattern is expected for the Project Site, given the shallow water depths. DO measurements taken in the northern portion of the Project Site in March through May of 2003 ranged from 9.4 to 11.4 mg/L (Rachlin Pers. Comm. 2004). Areas with DO concentrations less than 4.0 mg/L are often avoided by finfish, although most estuarine organisms can tolerate much lower concentrations for short periods.

Other indicators of water quality recorded for the Bronx River station in the Upper East River/Western Long Island Sound area include chlorophyll *a*, water transparency, suspended sediment, and pH. The concentration of chlorophyll *a* (used to estimate phytoplankton biomass) between 1999 and 2003 ranged from 0.9-129 µg/L and averaged 10.6 µg/L. Water transparency, measured with a Secchi disk, between 1999 and 2003 ranged from 2-8 feet and averaged 4.5 feet (NYCDEP 2004). Turbidity appears to be slightly increasing in this area. Within the lower New York Harbor Estuary, surface and bottom water pH ranges from 7.0-8.0 throughout the year (Brosnan and O'Shea 1995).

SEDIMENTS OVERVIEW

Complex flow patterns lead to widely variable sediment characteristics throughout the New York Harbor Estuary, varying from coarse sands and gravels in high-energy areas to fine-grained silts and clays in low-energy areas (USACE 1999). As is typical of urban watersheds, 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, 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. Within the New York/New Jersey 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).

EFH DESIGNATIONS

The NMFS designates EFH within 10' by 10' squares identified by latitude and longitude coordinates. The location of the Bronx River Greenway on the lower Bronx River is within a portion of the Hudson River estuary EFH that is situated in the 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 square includes the following waters: Atlantic Ocean waters within the square within the Hudson River Estuary affecting the following: Manhattan Island, New York City, College Pt., NY, Long Island City, NY, Brooklyn, NY, Port Morris, NY, Unionport, NY, Flushing Bay, Astoria, NY, LaGuardia Airport, Badland Isl., Rikers Isl., Roosevelt Isl., Wards Isl., and Hells Gate, along with the East River, the Harlem River, and the Bronx River. This area has been identified as EFH for 17 species of fish.

In addition to the 17 fish species, the lower Bronx River has been identified as Essential Fish Habitat (EFH) for the juvenile and adult life stage for three skate species, including the clearnose skate, little skate, and winter skate. Table D-A2-1 lists these species and life stages for which EFH has been designated for all 20 species.

Table D-A2-1
Essential Fish Habitat Designated Species for the Lower Bronx River

Species	Eggs	Larvae	Juveniles	Adults
Pollock (*Pollachius virens*)			X	X
Red hake (*Urophycis chuss*)		X	X	X
Winter flounder *(Pseudopleuronectes americanus*)	X	X	X	X
Windowpane (*Scophthalmus aquosus*)	X	X	X	X
Atlantic herring (*Clupea harengus*)		X	X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Atlantic butterfish (*Peprilus triacanthus*)		X	X	X
Atlantic mackerel (*Scomber scombrus*)			X	X
Summer flounder (*Paralichthys dentatus*)		X	X	X
Scup (*Stenotomus chrysops*)	X	X	X	
Black sea bass (*Centropristis striata*)			X	X
King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Cobia (*Rachycentron canadum*)	X	X	X	X
Sand tiger shark (*Odontaspis taurus*)		X		
Dusky shark (*Carcharinus obscurus*)		X		
Sandbar shark (*Carcharinus plumbeus*)		X		X

Table D-A2-1 (cont'd)
Essential Fish Habitat Designated Species for the Lower Bronx River

Species	Eggs	Larvae	Juveniles	Adults
Clearnose skate (*Raja eglanteria*)				X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Raja ocellata*)				X

Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at www.nero.nmfs.gov/ro/STATES4/conn_li_ny/40407350.html.

C. POTENTIAL IMPACTS TO EFH

GENERAL DISCUSSION OF AQUATIC IMPACTS

CONSTRUCTION

The results of the bathymetry study will be used to minimize the amount of dredging required for installation of the floating dock at Starlight Park. Potential impacts associated with dredging include localized and temporary increases in suspended sediments and the temporary loss of benthic macroinvertebrates in the area dredged. Water quality changes associated with increases in suspended sediment will be expected to be minimal and temporary, limited to the immediate area of the activity. Suspended sediments will dissipate shortly after the dredging is completed and the piles that will anchor the floating dock are driven into place.

The benthic community will be expected to reestablish within a short period of time as organisms colonize the area from adjacent areas. Estuarine species have behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment. Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates are fairly tolerant of elevated suspended sediment concentrations and have developed behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions in the field such as increases in suspended sediment and noise (Clarke and Wilber 2000), and also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. More mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans to suspended sediments that lasted up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000) which will not occur from the limited dredging that will occur as a result of the Proposed Project. The area of dredging will be small and the period of disturbance short. Therefore activity associated with dredging for the floating dock, should it be required, will not be expected to result in significant adverse impacts to water quality or populations of aquatic species using this portion of the New York Harbor Estuary.

The installation of the piles anchoring the floating dock will remove a small area of benthic habitat and the benthic macroinvertebrates within the footprint of each piling that are unable to move from the area of installation. Approximately 12-16 piles will be needed to anchor the dock

because it will be floating and not a fixed structure. The loss of this small area of habitat for benthic macroinvertebrates, plankton, and fish will not significantly impact the populations of the aquatic species using this portion of the New York Harbor Estuary, or the designation as EFH. The permanent loss of benthic macroinvertebrates within the piling footprints will not significantly impact the food supply for fish foraging in the area. Additionally, the pilings will provide a surface for encrusting organisms.

Bulkhead and riprap will be removed, where feasible, along the New York City Marshall's Impound Lot (aka PDJ Simone) and Apex Auto property shorelines (total of 802 feet), and the shorelines graded, naturalized, and stabilized with plantings. Results of the boring program (e.g., depth to bedrock) will be used to determine how and where regrading and naturalization of shorelines will be feasible. Stormwater from the Project Site will be managed to reduce direct discharges to the Bronx River. A stormwater pollution prevention plan (SWPPP) will be developed in accordance with NYSDEC's State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-02-01.

The proposed improvements to the traffic intersections and construction of the bridges, amphitheater, and multi-use path will not infringe on wetlands or the waterway as they are being constructed upland of the armor stone/riprap shoreline. Extension of the CSO by 30 feet will adversely impact 0.04 acres of littoral zone wetland. NYSDOT will mitigate for this loss of littoral zone through the creation of wetlands within the Project Site (most likely high marsh). The type of wetland creation will be determined during the design phase of the project. The loss of this small amount of littoral zone will not be expected to result in significant adverse impacts to water quality, aquatic biota, or EFH in the Bronx River. Fill activities will have the potential to cause temporary increases in suspended sediment in the immediate area where the fill is placed. Activities associated with bulkhead and riprap removal during restoration of natural shorelines also have the potential to result in localized, temporary increases in suspended sediments. Sediment control measures will be taken to minimize the amount of resuspended sediment and could include such measures as the use of turbidity curtains.

There will be potential for on-site erosion and sedimentation at construction sites where soils will be disturbed (i.e., bulkhead and riprap removal, installation of landscaping, construction of retaining walls, removal of impervious surfaces, etc.). Where these activities are located adjacent to the waterway there will be potential for localized, temporary increases in suspended sediment. The SWPPP will include erosion and sediment control measures that comply with the "New York Standards and Specifications for Erosion and Sediment Control" such as hay bales, silt fencing, vegetative covers, and slope and soil stabilization. Planting of the graded, naturalized shorelines with native vegetation will reduce the potential for erosion and sedimentation in these areas.

Starlight Park has a separate stormwater management plan to manage stormwater and reduce discharges to the Bronx River. Silt fences have been placed along the Bronx River shoreline adjacent to the park in preparation for remediation activities. Therefore, construction of the park will not be expected to adversely impact water quality, aquatic biota, or EFH in the lower Bronx River.

OPERATION

The bridges considered for the three pedestrian crossings over the river are 17 feet wide with 1 foot to either side for railings. Shading of water by the three pedestrian bridges over the Bronx

River will be approximately 8,512 square feet (0.195 acres). The cantilevered overlooks would shade approximately 1,520 square feet (0.03 acres). The floating dock and fixed platform have the potential to shade 2,414 square feet (0.055 acres) of water. Shading is of concern because it can adversely affect the habitat of some species of fish and lower productivity of primary producers. Studies of fish under very large piers (approximately 230,000 square feet, or 5.3 acres) indicate that shading could cause an adverse impact on the habitat for certain fish species because of these species' dependence on sight and light for feeding (Able et al. 1999). The bridge between Westchester Avenue and the AMTRAK railroad tracks will shade approximately 430 square feet (0.01 acres) of proposed high marsh on the west bank, 821 square feet (0.02 acres) of littoral zone, and a small amount of mudflat on the east bank. However, the areas of the three bridges and overlooks are very small and light will still be able to penetrate from the sides of these relatively narrow structures. The proposed 17 foot width is narrower than what is considered optimal for multi-use paths (22 feet) which reduces the potential impacts due to shading by the bridge structures. The small amount of shading resulting from the Proposed Project will not be expected to result in significant adverse impacts to water quality, aquatic biota, or EFH in the Bronx River.

Recreational boats visiting the park will be limited to small personal watercraft such as kayaks and canoes. These watercraft have shallow drafts and will not disturb the river bottom. Their use in the Bronx River will not result in significant adverse impacts to water quality, aquatic biota, or EFH in the Bronx River.

The CSO extension will be built with tide gates to prevent floatables from entering the river from the CSO. This will decrease the amount of debris discharged during storm events and improve water quality. Naturalization of shorelines and planting of wetland areas with native wetland species will be expected to result in improvements to water quality. The intertidal wetlands created during shoreline naturalization will enhance EFH within the Bronx River, offsetting the limited loss of habitat due to filling for the CSO extension and the potential loss of habitat for some fish due to shading of overwater structures. Installation of the CSO tide gate, increased green space, reduced impervious surfaces (approximately 3.33 acres), and reductions in direct discharges to the river will result in additional benefits to water quality in the lower Bronx River. The SWPPP will include measures to manage stormwater following construction in accordance with the "New York State Stormwater Management Design Manual." Therefore, operation of the Proposed Project will not be expected to result in significant adverse impacts to water quality, aquatic biota, or EFH in the Bronx River.

ASSESSMENT OF EFH SPECIES

Table D-A2-1 lists the 20 managed fish species that have been identified by the NMFS as having EFH in the lower Bronx River. King mackerel and Spanish mackerel, for which EFH has been identified for the egg, larval, juvenile, and adult life stages, are considered southern species. These species are rarely found as far north as the mid-Atlantic or New York Bight, and are often associated with marine, offshore habitats. Therefore, Atlantic and king mackerel are unlikely to occur within the Project Site except as occasional transient individuals. Cobia, for which EFH has been identified for the egg, larval, juvenile, and adult life stages, are highly migratory coastal pelagic fish that prefer salinities greater than 25 ppt. Cobia are unlikely to occur within the Project Site except as occasional transient individuals. The sandbar shark (EFH for larvae and adults), dusky shark (EFH for larvae), and sand tiger shark (EFH for larvae) are highly migratory shark species that rarely appear in the upper waters of the New York and New Jersey Harbor Estuary and will not be expected to occur within the Project Site.

The following sections present an analysis of EFH for each fish species and life stage for listed in Table D-A2-1—including the likelihood that the species will occur within the vicinity of the Proposed Action.

POLLOCK (Pollachius virens)

Pollock are marine fish that occur on both sides of the Atlantic (NEFMC 2000). In the western Atlantic, pollock occur from the Hudson Strait south to North Carolina, and is rare at the extremes of its range (Fishbase 2002). In the northwest Atlantic they are most abundant on the western Scotian Shelf and in the Gulf of Maine. There is one major spawning area in the western Gulf of Maine and several spawning areas on the Scotian Shelf (NEFSC 2002). The lower Bronx River is part of an area designated as EFH for juvenile and adult pollock.

Juvenile pollock are common in inshore areas and move offshore as they get older. The typical habitat for juveniles is bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks with water temperatures below 18°C (65°F), depths from 0-250 meters (0-820 feet), and salinities of about 29 ppt or 30 ppt (NEFMC 2000). This is a higher salinity than is typical for the lower Bronx River in the northern portion of the Project Site above the weir (Rachlin Pers. Comm. 2004). In addition, there is currently little, if any, aquatic vegetation to provide nursery areas for juvenile pollock at the Project Site.

Adult pollock are found on hard bottom habitats, including artificial reefs, with water temperatures below 14°C (57.2°F), depths from 15-365 meters (50-1,200 feet), and marine salinities above 31 ppt (NEFMS 2000). These are greater depths and salinities and lower temperatures than are typical for the lower Bronx River (NYCDEP 2001).

Adults are the stage of pollock with the greatest potential to occur in the vicinity of the Project Site, however, the low salinities encountered above the weir will limit their presence. If present, adults of this species are expected to be transient. The northeast pollock stock is considered overfished (the stock size is below its prescribed biomass threshold), but overfishing is not currently occurring. A rebuilding program should be ready for implementation by April of 2004 (NMFS 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to contribute to improved water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

RED HAKE (Urophycis chuss)

Red hake is a bottom-dwelling fish that lives on sand and mud bottoms along the continental shelf from southern Nova Scotia to North Carolina (concentrated from the southwestern part of the Georges Banks to New Jersey). Spawning adults and eggs are common in marine portions of most coastal bays between Rhode Island and Massachusetts. Spawning occurs from May to June in the New York Bight (Steimle et al. 1999a). The lower Bronx River is within an area designated as EFH for larval, juvenile, and adult red hake.

Larval red hake are free floating and occur in the middle and outer continental shelf. They are most common in water temperatures from 11-19°C (52-66°F) and depths from 10 to 200 m (33-660 feet). Recently metamorphosed juveniles remain pelagic (occupy open water areas) for about two months where they then begin growth up to 25-30 mm (1.0-1.2 inches) in total length. Shelter is a critical habitat requirement for red hake. In the autumn, young juveniles descend

from the water column to the bottom and seek sheltering habitat in depressions in the sea floor. Settling peaks usually occur in October and November. Older juveniles use scallop shells, mussel beds, surf clam collars, etc., residing near these shelters until their second autumn when they move inshore to within 55 m (180 feet) depths. They will remain inshore until the temperature reaches 4°C (39°F), at which point they head offshore to overwinter (USACE 2000; Steimle et al. 1999a).

Woodhead (1990) describes red hake as a common resident of the New York Harbor system. In the Hudson-Raritan Estuary, the distribution of red hake is influenced by salinity, water temperature, and dissolved oxygen. Juvenile red hake were collected when salinity was greater than 22 ppt and at depths from 5-50 m (16-164 feet) deep. Collections tapered off when salinity reached greater than 28 ppt. Adult red hake prefers temperatures from 2-22°C (36-72°F), salinity ranging from 20-33 ppt and depths greater than 25 m (82 feet) deep. In Middle Atlantic Bight, red hake occur most often in coastal waters in the spring and autumn, moving offshore to avoid the warm summer temperatures. Additionally, red hake have been reported to be sensitive to low DO levels, preferring concentrations of 6 mg/L or more within the Hudson-Raritan Estuary (Steimle et al. 1999a).

The water quality measurements from the nearby NYCDEP Harbor Survey lower Bronx River monitoring station and salinity measurements above the weir suggest that juvenile red hake presence within the Project Site may be occasionally limited by low DO and salinity, adults may be limited by salinity levels and shallow depths. The portion of the lower Bronx River in the vicinity of the Project Site makes up a small portion of the EFH for this species and most of the adults and juveniles appear to occur south of the Narrows within the Hudson-Raritan Estuary (Steimle et al. 1999a). Additionally, the southern stock of red hake (the stock that occurs within the New York/New Jersey Harbor) is not currently considered overfished (NMFS 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

WINTER FLOUNDER (Pseudopleuronectes americanus)

Winter flounder can be found from Labrador to North Carolina but most commonly in estuaries from the Gulf of St. Lawrence to the Chesapeake Bay including the Lower Hudson (Heimbuch et al. 1994; USACE 2000). It is a fairly small, thick flatfish that is abundant in the Lower Hudson River Estuary, where it is a resident, but may travel upriver into fresh water (Heimbuch et al. 1994). It spawns during the winter and early spring, typically at night in shallow, inshore estuarine waters with sandy bottoms. Woodhead (1990) reports spawning to occur mostly in the Lower New York Bay and the New York Bight. The lower Bronx River is within an area designated as EFH for eggs, larval, juvenile, and adult winter flounder.

Eggs float in the top 25 cm (10 inches) of the intertidal zone and clump together post-fertilization at which point they sink (Heimbuch et al. 1994; USACE 2000). Optimal egg hatching occurs at 3°C (37°F) and in salinity ranging from 15-25 ppt. Winter flounder larvae develop to juveniles within the estuarine system. In March, April and May, winter flounder larvae can be found in the Upper New York Bay near the bottom (Heimbuch et al. 1994).

For the first summer, young-of-year winter flounder remain in the shallow waters (0.1-10 m [0.3-33 feet] in depth) of bays and estuaries where they were spawned, where temperatures are less than 28°C (82°F) and salinities range from 5-33 ppt. Juveniles often occupy areas with sand and/or mud substrates. Some juveniles beyond their first year may overwinter in estuaries at temperatures less than 25°C (77°F), salinities from 10-30 ppt, and depths from 1-5 m (3-16 feet). However, in winter, juvenile catches generally increased outside of the estuary while at the same time decreasing within the estuary, suggesting that some juveniles also migrate out of the estuary in the winter (Pereira et al. 1999).

Adult winter flounder prefer depths of 20 to 48 m (66-158 feet) and are commonly associated with mud, sand, pebble, or gravel bottoms (USACE 2000). Adults generally leave the New York Harbor estuary in the summer as water temperatures increase, returning to the Harbor in the autumn (Woodhead 1990). Winter flounder will live close to shore, swimming into shallow water to feed. Adults tend to move to deeper water when water temperatures increase in the summer or decrease in the autumn and winter (Heimbuch et al. 1994). NMFS Northeast Fisheries Science Center (NEFSC) trawls within the Hudson-Raritan estuary found adult winter flounder at temperatures between 4-12°C (39-54°F) and salinities as low as 15 ppt, although most were found at salinities greater than 22 ppt. The bulk of the adult catch occurred in water depths of 25 m (82 feet) or less in the spring (during and just after spawning) and 25 m or deeper in the autumn (prior to spawning) (Pereira et al. 1999).

Winter flounder are bottom fish and all stages of this species have the potential to occur within the vicinity of the Project Site but will be mostly likely south of the weir. Juveniles feed on a variety of worms and small crustaceans, switching to mostly mollusks as they grow. Adults eat small invertebrates and fish fry. Because they are sight feeders increased turbidity can interfere with feeding success (USACE 2000).

Winter flounder were collected in the Bronx River south of the Project Site below Lafayette Avenue during recent surveys (Rachlin 2004). While winter flounder are found throughout the New York/New Jersey Harbor Estuary, this species is currently experiencing high fishing rates that are in excess of natural production—recent annual exploitation rates (proportion of the biomass removed by fishing) range from 55-70 percent. The Southern New England/Mid-Atlantic stock unit (which includes the New York population), is considered to be overfished (NMFS 2003). The 2001 exploitation rate was 37 percent (ASMFC 2002). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

WINDOWPANE (*Scophthalmus aquosus)*

Windowpane, also called sand flounder, is found from the Gulf of St. Lawrence to South Carolina and has its maximum abundance in the New York Bight. Windowpane are generally found offshore on sandy bottoms in water between 50 m and 80 m deep (164-262 feet), and close inshore in estuaries just below the mean low water mark. They migrate onshore in the shallow shoal water in the summer and early autumn as water temperatures increase, and migrate offshore during the winter and early spring months when temperatures decrease. Windowpane spawn within the mid-Atlantic Bight from April to December in the bottom waters with

temperatures ranging from 8.5-13.5°C (47-56°F). Spawning peaks occur in May and then again in the autumn in the southern portion of the Bight (USACE 2000). The lower Bronx River is within an area designated as EFH for eggs, larval, juvenile, and adult windowpane.

The buoyant eggs and larvae that settle to the bottom are found predominately in the estuaries and coastal shelf water for the spring spawned eggs, and in the coastal shelf waters alone for those eggs spawned in the autumn. Windowpane eggs are found floating in the water column at temperatures of 5-20°C (41-68°F), specifically at 4-16°C (39-61°F) in spring (March through May), 10-16°C (50-61°F) in summer (June through August), and 14-20°C (57-68ºF) in autumn (September through November), and within depths less than 70 m (230 feet) (Chang et al. 1999). Larvae are typically found in the area of the estuary where salinity ranges from 18 to 30 ppt in the spring and on the shelf in the autumn. Juvenile windowpane were found year-round in both the shelf waters and in the Hudson-Raritan Estuary. Larvae are found at similar temperature and depth as the egg stage of this species, particularly at 3-14°C (37-57°F) in the spring, 10-17°C (50-63°F) in the summer, and 13-19°C (55-66°F) in the autumn (Chang et al. 1999).

Within the estuary, juvenile fish were fairly evenly distributed but seemed to prefer the deeper channels in the winter and summer. They were most abundant where bottom water temperatures ranged from 5 to 23°C (41-73°F), depths ranged from 7-17 m (23-56 feet), salinities ranged from 22-30 ppt, and dissolved oxygen concentrations ranged from 7-11 mg/L. Similarly, adults were fairly evenly distributed year-round, preferring deeper channels in the summer months. Adults were collected in bottom waters where temperatures ranged from 0 to 23°C (32-73°F), depths were less then 25 m (82 feet), salinity ranged from 15-33 ppt, and dissolved oxygen ranged from 2-13 mg/L (USACE 2000).

All stages of windowpane have the potential to occur within the vicinity of the Project Site, primarily south of the weir. Juveniles and adults are less likely to occur in the relatively shallow waters of the Project Site during the winter and summer. The southern New England/Middle Atlantic stock is currently considered to be overfished although overfishing is not currently occurring (NMFS 2003). As with winter flounder, this species is widely distributed in the New York Harbor Estuary. The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

ATLANTIC HERRING (Clupea harengus)

Atlantic herring is a planktivorous marine species that occurs throughout the Northwestern Atlantic waters from Greenland to North Carolina. They are most abundant north of Cape Cod and relatively scarce in waters south of New Jersey (USACE 2000). Atlantic herring rarely move into fresh water (Smith 1985). The lower Bronx River is within an area designated as EFH for larval, juvenile, and adult Atlantic herring.

Juvenile and adult herring undergo complex north-south migrations and inshore-offshore migration for feeding, spawning, and overwintering. They spawn once a year in late August to November, in the coastal ocean waters of Gulf of Maine and Georges Banks. This species never spawns in brackish water. Post-spawn, the adults migrate to the New York Bight to overwinter from December to April. The autumn migration to overwintering areas is done in tight schools

while the spring migration to spawning areas is much more dispersed. Fish that pass through the mid-Atlantic Bight are typically four years of age or older (USACE 2000).

Larval herring are free-floating and for Autumn-spawned fish this stage can last 4-8 months. Portions of those hatched remain at the spawning site while others drift in ocean currents reaching eastern Long Island Sound. In the Gulf of Maine, larvae occur at temperatures ranging from 9-16°C (48-61°F), and a salinity of 32 ppt. During post-metamorphosis, which occurs through April and May, juveniles form large schools and move into shallow waters. Large schools of juveniles have been found in Connecticut and southern Massachusetts in May and June. In the summer and autumn, juveniles move out of the nearshore waters to overwinter in deep bays or near the bottom in offshore areas. Within Long Island Sound, springtime abundances have been reported as being highest at temperatures ranging from 9-10°C (48-50°F), depths ranging from 10-30 m (33-98 feet), and salinity ranging from 25-28 ppt. Within the Hudson-Raritan Estuary, catches of herring were highest at temperatures ranging from 3 to 6°C (37-43°F) and in the deeper portions of the estuary (USACE 2000). Juveniles collected in the Hudson-Raritan Estuary NEFSC bottom trawl surveys were found to prefer temperatures at 2-16°C (36-61°F) and 12-22°C (54-72°F), being most abundant at 4-6°C (40-43°F) and 15-18°C (59-64°F). Juveniles are commonly found at depths ranging from 30-135 m (98-443 feet), preferring deeper waters in the summer (Reid et al. 1999).

On average, males and females mature at about 25-27 cm (10-11 inches). In the Hudson-Raritan estuary NEFSC bottom trawl surveys, adults were most abundant at 3-6°C (37-43°F) at depths ranging from 4.5-13.5 m (14-44 feet). Atlantic herring prefer salinities 28 ppt or greater (Reid et al. 1999). Juveniles and adults perform diel and semi-diel vertical migrations in response to daily photoperiods and increased turbidity. Being sensitive to light intensity, activity is highest after sunrise and just before sunset where the herring will avoid the surface during daylight to avoid predators (Reid et al. 1999).

No spawning will occur within the vicinity of the Project Site and larvae will not likely be found due to their salinity and temperature preferences. Juvenile and adult Atlantic herring will be unlikely to occur except as occasional transient individuals in the vicinity of the Project Site because of salinity and depth preferences. The Atlantic herring stock complex in the northeastern United States is considered under-utilized with the exception of the portion in the Gulf of Maine (Reid et al. 1999) and is not overfished (NMFS 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area and will not be expected to affect aquatic organisms. Therefore, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

BLUEFISH (Pomatomus saltatrix)

Bluefish is a carnivorous marine fish that occurs in temperate and tropical waters on the continental shelf and in estuarine habitats around the world. In North America, bluefish live along most of the Atlantic coastal waters from Nova Scotia south, around the tip of Florida, and along the Gulf Coast to Mexico. Bluefish migrate between summering and wintering grounds, generally traveling in groups of fish of similar sizes loosely aggregated with other groups. They generally migrate north in the spring and summer and south in the autumn and winter. Along the North Atlantic, summering ground centers are located in the New York Bight as well as southern New England and northern sections of the North Carolina coastline. Wintering grounds are found in the southeastern parts of the Florida coast. Juvenile and adult bluefish travel far up estuarine waters (where salinity may be less then 10 ppt) while eggs and larvae are largely

restricted to marine habitats (USACE 2000). The lower Bronx River is within an area designated as EFH for juvenile and adult bluefish.

There are two spawning stocks along the U.S. Atlantic coast—a south Atlantic spring spawn, and mid-Atlantic summer spawn. The fish active in the spring spawn migrate to the Gulf Stream/coastal shelf interface between northern Florida and Cape Hatteras, in April and May. Post-spring spawn, smaller bluefish drift west while the larger fish slowly migrate north along the shelf and west into mid-Atlantic bays and estuaries where they stay until autumn. Summer spawning fish migrate to the mid-Atlantic from Cape Cod to Cape Hatteras in June through August. Summer post-spawn fish head towards the mid-Atlantic shores and are particularly abundant in Long Island Sound (USACE 2000; Fahay et al. 1999). Juveniles from the spring spawn drift north in the early summer and also enter the important nursery habitats in estuaries and bays along the mid-Atlantic coast in June. Summer spawned fish enter the estuaries in middle to late summer (Buckel et al. 1999). All spent fish and juveniles migrate to the wintering grounds in the autumn (USACE 2000).

Juveniles in the Mid-Atlantic Bight inhabit inshore estuaries from May to October, preferring temperatures between 15 and 30°C (59-86°F), and salinities between 23 ppt and 33 ppt. Although juvenile and adult bluefish are moderately euryhaline, occasionally they will ascend well into estuaries where salinities may be less than 3 ppt. Juveniles use estuaries as nursery areas, and can be found in sand, mud, silt, or clay substrates as well as *Spartina* or *Fucus* beds. Bluefish juveniles are sensitive to changes in temperature. Thermal edges apparently serve as important cues to juvenile migration off shore in the winter season (Fahay et al. 1999).

Adult bluefish are pelagic and highly migratory with a seasonal occurrence in Mid-Atlantic estuaries from April to October. They prefer temperatures from 14-16°C (57-61°F) but can tolerate temperatures from 11.8-30.4°C (35-87°F) and salinities greater than 25 ppt. Adult bluefish are not uncommon in bays and larger estuaries, as well as coastal waters (Bigelow and Schroeder 1953, Fahay et al. 1999).

No spawning will occur within the Project Site. Juvenile and adult bluefish presence at the Project Site may be limited by the low salinities encountered above the weir. Bluefish was categorized as overfished—the stock size was below the minimum threshold set for this species—and a rebuilding program was implemented. However, recent estimates of fishing mortality suggest that the rebuilding program, state-by-state quota system, and recreational harvest limit have been successful and that overfishing is no longer occurring (MAFMC 2002, NMFS 2003). Further, during the period from 2000 through 2002, the recreational and commercial sectors landed only 59 percent of the authorized total landings allowed, most likely due to decreased recreational fishing pressure as other species' populations have increased (MAFMC 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

ATLANTIC BUTTERFISH (Peprilus triacanthus)

Butterfish occur from Newfoundland to Florida and are most abundant between southern New England and Cape Hatteras. It has been suggested that two populations of Butterfish exist. One population appears largely restricted to shoals (less than 20 m [66 feet]) south of Cape Hatteras,

and another mainly north of Hatteras that occurs in shoals and possibly some deeper waters along of the shelf. The lower Bronx River is within an area designated as EFH for larval, juvenile, and adult Atlantic butterfish.

Throughout its range, butterfish are found over the entire shelf, inshore and offshore. Cooling temperatures associated with late autumn trigger a migration offshore to the edges of the shelf where waters are warm. Butterfish require 10°C (50°F) for survival. This species spawns from June to August in inshore waters generally less then 30 m (98 feet) deep. Peak egg production is in late June and early July off Long Island Sound. Studies performed in the Hudson-Raritan Estuary noted that butterfish comprised less than 1 percent of total catches of fish (USACE 2000).

Newly hatched larvae are between 2 mm and 16 mm (0.1-0.6 inches) long. Larvae are found at the surface or in the shelter of the tentacles of large jellyfish, and are more nektonic (free swimming) than planktonic (drift with water movements) when between 10 and 15 mm (0.4-0.6 inches) long. Larvae are found at temperatures ranging from 7-26°C (45-79°F), although most abundant at 9-19°C (48-66°F), and at depths less than 120 m (394 feet) (Cross et al. 1999).

At 6 mm (0.24 inches) larval body depth has increased substantially in proportion to length and at 15 mm (0.6 inches), the fins are differentiated and the young fish takes on the general appearance of the adult. Adult butterfish can range from 120-305 mm (4.7-12 inches) long. Both juveniles and adults have similar habitat characteristics. They are eurythermal and euryhaline and are common near the surface in sheltered bays and estuaries during the spring to autumn months. In the Hudson-Raritan trawl survey, juveniles and adults were found at depths from 3-23 m (10-75 feet), salinities from 19-32 ppt, and dissolved oxygen from 3-10 mg/L. Juvenile and adult butterfish also often prefer sandy and muddy substrates, and temperatures from 3-28°C (37-82°F) (Cross et al. 1999).

Occasional adult and juvenile butterfish have the potential to occur within the vicinity of the Project Site. Spawning is unlikely to occur within the Project Site. Woodhead (1990) reports butterfish to be a common transient in the New York Harbor in the summer. Atlantic butterfish prefer sandy bottoms but are not closely associated with the bottom when inshore during the summer. They may stay close to the bottom during the day and move upward at night (Smith 1985). Butterfish stock is not overfished or approaching an overfished condition (Cross et al. 1999, NMFS 2003) and it is considered an underexploited fishery (Cross et al. 1999). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. Therefore, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

ATLANTIC MACKEREL (Scomber scombrus)

Atlantic mackerel is a pelagic marine fish that occurs in the western North Atlantic from Labrador to North Carolina. It sustains fisheries from the Gulf of St. Lawrence and Nova Scotia to the Cape Hatteras area. The lower Bronx River is within an area designated as EFH for juvenile and adult Atlantic mackerel. There may be two populations: one occurring in the northern Atlantic and associated with the New England and Maritime Canadian coast, and another more southerly population inhabiting the mid-Atlantic coast. Both populations

overwinter in the deep waters at the edge of the continental shelf, generally moving inshore (in a northeastern direction) during the spring, and reversing this migration in autumn.

The southern population begins its spawning migration by moving inshore between the Delaware Bay and Cape Hatteras and in a northeastern direction along the coast. The timing of the migration and spawn is a result of warming water temperatures. The peak spawn for the southern population occurs off New Jersey and Long Island Sound in April and May. Most spawning occurs in the shoreward half of the shelf and in waters from 7-14°C (45-57°F) (with the peak being 10-12°C (50-54°F) (Studholme et al. 1999). By June there are schools of juveniles off Massachusetts, and they move into the Gulf of Maine by June and July where they remain for the summer. In the Hudson-Raritan Estuary, juveniles are present from April to December, but are most common from April through June and October through November. Adults are present from April through June and from September through December, most commonly from April to May and from October to November (USACE 2000).

Juvenile transformation includes swimming and schooling behaviors starting at 30-50 mm (1.2-2.0 inches), and closely resemble adults when about 1 year in age. In the Hudson-Raritan Bay estuary, juveniles are present in the spring and summer months preferring depths from 4.9-9.8 m (16-32 feet), salinity ranges from 26-28.9 ppt, dissolved oxygen from 7.3-8.0 mg/L and temperatures from 17.6-21.7°C (64-71°F) (Studholme et al. 1999).

Adult Atlantic mackerel can range from 26 cm (10 inches) in their second year to about 40 cm (15.8 inches) in their sixth year. NEFSC trawl surveys show that adults are found in the spring at temperature ranges from 5-13°C (41-55°F) dispersed from 0-380 m (1,250 feet) (most abundant at 160-170 m [525-558 feet]), and in the summer at temperatures ranging from 4-14°C (39-57°F) at depths of 10-180 m (33-591 feet) (abundant at 50-70 m [164-230 feet]). Adults also prefer salinities of 25 ppt or greater (Studholme et al. 1999).

Atlantic mackerel were rarely collected during trawls in the New York Harbor by USACE from October 1998 through November 1999 (USACE 1999). Most individuals are found in the Lower Harbor (Raritan Bay and Sandy Hook Bay) (Woodhead and McEnroe 1991 in USACE 1999). Spawning is unlikely to occur in the lower Bronx River. Juvenile and adult Atlantic mackerel will be unlikely to occur within the Project Site north of the weir and will not be expected to occur south of the weir except as occasional transient individuals. The habitat found within the Project Site does not represent a significant portion of the EFH for this species. The Atlantic mackerel fishery is no longer considered overfished and this stock is now considered underexploited (MAFMC 2002; NMFS 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota or habitat in the river. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

SUMMER FLOUNDER (Paralichthys dentatus)

Summer flounder prefer the estuarine and shelf waters of the Atlantic Ocean and are found between Nova Scotia and southeastern Florida. They are most abundant from Cape Cod, Massachusetts, to Cape Hatteras, North Carolina. The lower Bronx River is within an area designated as EFH for larval, juvenile, and adult summer flounder. Summer flounder usually

appear in the inshore waters of the New York Bight in April, continuing inshore in May and June, and reach their peak abundance in July and August. Spawning takes place in the New York Bight in nearshore waters outside estuarine systems in September to October. Spawning occurs in surface water temperatures of 7-14°C (45-57°F), with a peak around 10-12°C (50-54°F) (Packer et al. 1999).

Larvae occur in water from 0-22°C (32-72°F) and are transported to estuarine nurseries by currents. They are distributed throughout the estuary prior to late summer and are more concentrated in sea grass beds as opposed to tidal marshes in the late summer and early autumn (USACE 2000). Planktonic larvae (2-13 mm [0.08-0.5 inches]) have been found in temperatures ranging from 0-23°C (32-73°F), but are most abundant between 9 and 17°C (48-63°F). Within New Jersey waters, summer flounder larvae have been found to prefer salinities ranging from 20-30 ppt. In the Mid-Atlantic Bight, larvae were found at depths from 10-70 m (33-230 feet). Greater densities of young fish were found in or near inlets (Packer et al. 1999).

Young summer flounder move into shallow (found usually at 0.5-5.0 m [1.6-16 feet] in depth) estuaries using them as nursery habitat in the autumn, summer, and spring months. Juvenile summer flounder are well adapted to the temperature and salinity ranges present in estuarine habitats. They are able to withstand a wide range of temperatures, and salinities ranging from 10-30 ppt. Juveniles can be found on mud and sand substrates in flats, channels, salt marsh creeks, and eelgrass beds (Packer et al. 1999).

Adult summer flounder feed both in the shelf waters and estuaries, and are more active in the daylight hours since they are primarily visual feeders (USACE 2000). Adults are found to grow to lengths ranging from 25-71 cm (10-28 feet). Adults inhabit sand substrates usually at depths up to 25 m (82 feet), at temperatures ranging from 9-26°C (48-79°F) in the autumn, 4-13°C (39-55°F) in the winter, 2-20°C (36-72°F) in the spring, and 9-27°C (48-81°F) in the summer. Salinity is known to have minimal effect on distribution in comparison to substrate preference (Packer et al. 1999).

Spawning of summer flounder will not occur in the vicinity of the Project Site. Larvae, juveniles, and adults will have the potential to occur in the vicinity of the Project Site. Summer flounder have been collected in areas of the Upper Harbor, primarily in the summer (USACE 1999). In 2002 the stock was considered overfished and was in the 8th year of a 10-year rebuilding program (NMFS 2003; MAFMC 2002). However, the latest stock assessment for summer flounder indicates that management measures have been successful. The resource is no longer overfished and overfishing is not occurring. Summer founder biomass is estimated to be above the threshold point for the first time since this species was placed under the joint management of the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid-Atlantic Fishery Management Council (MAFMC). The ASMFC and MAFMC have recommended increasing the total allowable landing limits to 28.2 million pounds in 2004 (compared to 23 million pounds in 2003) (ASMFC 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. For these reasons, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

SCUP (Stenotomus chrysops)

Scup is a marine fish that occurs primarily on the continental shelf from Cape Cod, Massachusetts to Cape Hatteras, North Carolina. The lower Bronx River is within an area designated as EFH for eggs, larval, and juvenile scup. Scup arrive in the waters off New Jersey and New York by early May. During the summer months, older fish (four years old or older) tend to stay in the inshore waters of the bays while the younger fish are found in the more saline waters of estuaries such as the Hudson-Raritan Estuary. Spawning occurs in May through August with a peak in June and occurs principally in the estuaries of New York and New Jersey. Juveniles grow quickly and migrate with the rest of the population to offshore wintering grounds starting in late October and are absent from inshore waters by the end of November (USACE 2000).

Scup eggs are buoyant and are rather small (0.8 to 1.0 mm [0.03-0.04 inches]), hatching in about 2-3 days depending on temperature. Most eggs are collected from May-August at depths less than 50 m (164 feet) and at temperatures ranging from 11-23°C (52-73°F) (Steimle et al. 1999c).

Newly hatched larvae are pelagic and approximately 2 mm (0.08 inches) long. In approximately three days, diagnostic characters of the species are evident and shortly afterwards the larvae abandon the pelagic phase and become bottom dwelling. They occur at water temperatures ranging from 14-22°C (57-72°F) and occupy more saline (23-33 ppt) portions of bays. They are often found within the water column at depths less than 50 m (164 feet) (Steimle et al. 1999c).

Juveniles from 15-30 mm (0.6-1.2 inches) (up to 10 cm [4 inches]) are common during November. By the end of their first year they can reach up to 16 cm (6.3 inches). Juveniles inhabit estuarine intertidal areas at depths of 5-12 m (16-39 feet), particularly areas with sand and mud substrates or mussel and eelgrass beds. Juveniles prefer temperatures from about 9-27°C (48-81°F) and salinities greater than 15 ppt (Steimle et al. 1999c).

Scup males and females reach sexual maturity at age two and reach about 15.5 cm (6 inches) in length. From April to December, adults can be found inshore along silt, sand, and mud substrates at depths less than 30 m (98 feet). Adults prefer temperatures ranging from 6-27°C (43-81°F), and salinities ranging from 20-30 ppt (Steimle et al. 1999c).

In the New York Harbor, spawning occurs primarily in the Lower New York Bay and the Eastern Long Island Bay (USACE 2000) and is not expected to occur within the vicinity of the Project Site. Juveniles may occur within the portion of the estuary in the vicinity of the Project Site in the summer and autumn but their presence may be limited by the low salinities encountered above the weir. Woodhead (1990) reports that scup is a common summer transient in the New York Harbor. The EFH for this marine species is primarily in the higher salinity areas of the southern portion of the Upper Harbor (USACE 1999). The stock rebuilding schedule and management measures implemented in 1996 have resulted in a dramatic increase in scup abundance and recent data suggest the stock is no longer overfished (MAFMC 2002; ASMFC 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. Therefore, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

BLACK SEA BASS (Centropristis striata)

Black sea bass is a marine species that occurs from Cape Cod, Massachusetts to Cape Canaveral, Florida. The lower Bronx River is within an area designated as EFH for juvenile and adult black sea bass. The fishery is divided into a northern population above Cape Hatteras, North Carolina, and a southern population below Cape Hatteras. The northern population migrates seasonally: inshore and north in the spring, and offshore and south in the autumn. In the autumn, older fish move offshore sooner and overwinter in deeper waters (73 to 163 m [240-535 feet]) than young-of-the-year fish (56 to 110 m [184-361 feet]). Black sea bass can tolerate temperatures as low as 6°C (43°F) but are most abundant in off-shore waters warmer than 9°C (48°F), between 20 to 60 m (66-197 feet) deep (USACE 2000). During the spring migration, adults move to spawning grounds and juveniles move into estuaries. For the northern population spawning generally takes place in the summer, in water 18 to 45 m deep from the Chesapeake Bay to Montauk.

Larvae develop for the most part in continental shelf waters and are most abundant in the southern portion of the Middle Atlantic Bight. They quickly become bottom dwellers and estuarine. In the mid-Atlantic Bight, young-of-year fish inhabit estuaries from July to September, at depths from 1-38 m (3-125 feet). They prefer rough bottom habitats with shells, amphipod tubes, and deep channel rubble (Steimle et al. 1999b) and have been noted to appear on inshore jetties in late May to early June. In the Hudson River Estuary, young-of-the-year have been captured in open water and interpier areas. The young-of-year are migratory during some portions of the first year (USACE 2000). They migrate out of the estuary and away from inner continental shelf nursery areas during the autumn as water temperatures drop (Steimle et al. 1999b). Young-of-the-year have been collected in the lower Hudson River off Manhattan from mid-July to September (Able et al. 1995).

Juvenile sea bass occur in the saline portions of estuaries from Massachusetts to Florida starting with the initial spring migration until late autumn. During this period they can grow up to 19 cm (7.5 inches). Juveniles can be found in water temperatures ranging from 6-30°C (43-86°F) and salinities ranging from 8-38 ppt (but most preferring 18-20 ppt) (USACE 2000). They prefer hard bottom (Bigelow and Schroeder 1953), and are commonly found around jetties, piers, wrecks, and bottom areas with shells (USACE 2000).

Adult black sea bass prefer similar habitat conditions to juveniles, and perform similar migratory patterns. Adults also find shelter around manmade structures (Steimle et al. 1999b). Black sea bass are bottom feeders, consuming crabs, shrimp, mollusks, small fish, and squid. Woodhead (1990) describes black sea bass as a common summer transient in the New York Harbor, and individuals have been collected in the New York Harbor and the Arthur Kill (Smith 1985).

Juvenile and adult black sea bass have the potential to occur within the vicinity of the Project Site. While previously considered overfished, management efforts have been successful in rebuilding the stock and it is no longer considered overfished (ASMFC 2003). The ASMFC and MAFMC recently recommended increasing the total allowable landing limit for black sea bass from 6.8 million pounds in 2003 to 8.0 million pounds in 2004 (ASMFC 2003). The potential for water quality impacts from construction of the Proposed Project will be limited in duration and area. The extent of bottom habitat lost due to extension of the CSO will be small. Operation of the Bronx River Greenway will be expected to improve water quality of the lower Bronx River and will not be expected to result in significant adverse impacts to aquatic biota. Therefore, the Proposed Project will not be expected to result in significant adverse impacts to the EFH for this species.

KING MACKEREL (Scomberomorus cavalla)

King mackerel is a marine fish that inhabits Atlantic coastal waters from the Gulf of Maine to Rio de Janeiro, Brazil, including the Gulf of Mexico. The lower Bronx River is within an area designated as EFH for eggs, larval, juvenile, and adult king mackerel. There may be two distinct populations of king mackerel. One group migrates from waters near Cape Canaveral, Florida south to the Gulf of Mexico, making it there by spring and continuing along the western Florida continental shelf throughout the summer. A second group migrates to waters off the coast of the Carolinas in the summer, after spending the spring in the waters of southern Florida, and continues on in the autumn to the northern extent of the range. Overall, temperature appears to be the major factor governing the distribution of the species. The northern extent of its range is near Block Island, Rhode Island, near the 20°C (68°F) isotherm and the 18-meter (59 feet) contour. King mackerel spawn in the northern Gulf of Mexico and southern Atlantic coast. Larvae have been collected from May to October, with a peak in September. In the south Atlantic, larvae have been collected at the surface with salinities ranging from 30 to 37 ppt and temperatures from 22-28°C (70-81°F). Adults are normally found in water with salinity ranging from 32-36 ppt (USACE 2000).

King mackerel will occur only as occasional transient individuals within the New York/New Jersey Harbor Estuary system, and will only be likely to occur in the Lower Harbor area where the salinities are higher. Therefore, EFH for this species will not be affected by the Proposed Project.

SPANISH MACKEREL (Scomberomorus maculatus)

Spanish mackerel is a marine species that can occur in the Atlantic Ocean from the Gulf of Maine to the Yucatan Peninsula. The lower Bronx River is within an area designated as EFH for eggs, larval, juvenile, and adult Spanish mackerel. Spanish mackerel is most common between the Chesapeake Bay and the northern Gulf of Mexico from spring through autumn, then moves south to overwinter in the waters of south Florida. These populations spawn in the northern extent of their ranges (along the northern Gulf Coast and along the Atlantic Coast). Spawning begins in mid-June in the Chesapeake Bay and in late September off Long Island, New York. Temperature is an important factor in the timing of spawning and few spawn in temperatures below 26°C (79°F). Spanish mackerel apparently spawn at night. Studies indicate that Spanish mackerel spawn over the Inner Continental Shelf in water 12-34 m (39-112 feet) deep.

Spanish mackerel eggs are pelagic and about 1 mm in diameter. Hatching takes place after about 25 hours at a temperature of 26°C. Most larvae have been collected in coastal waters of the Gulf of Mexico and the east coast of the United States. Juvenile Spanish mackerel can use low salinity estuaries (about 13-20 ppt) as nurseries and also stay close inshore in open beach waters (USACE 2000).

Overall, temperature and salinity is indicated as the major factor governing the distribution of this species. The northern extent of their range is near Block Island, Rhode Island, near the 20°C (68°F) isotherm and the 18 meter contour. During warm years, they can be found as far north as Massachusetts. They prefer water from 21-27°C (70-81°F) and are rarely found in waters cooler than 18°C (64°F). Adult Spanish mackerel generally avoid freshwater or low salinity (less than 32 ppt) areas such as the mouths of rivers (USACE 2000).

Because this is a marine species that prefers higher salinity waters, only occasional individuals are likely to occur within the vicinity of the Project Site. Therefore, EFH for this species will not be affected by the Proposed Project.

COBIA (Rachycentron canadum)

Cobia are large, migratory, coastal pelagic fish of the monotypic family Rachycentridae. In the western Atlantic Ocean, cobia occur from Massachusetts to Argentina, but are most common along the south Atlantic coast of the United States and in the northern Gulf of Mexico. In the eastern Gulf, cobia typically migrate from wintering grounds off south Florida into northeastern Gulf waters during early spring. They occur off northwest Florida, Alabama, Mississippi, and southeast Louisiana wintering grounds in the fall. Some cobia overwinter in the northern Gulf at depths of 100 to 125 m (328 to 410 feet). The lower Bronx River is within an area designated as EFH for eggs, larval, juvenile and adult cobia.

Information on the life history of cobia from the Gulf and the Atlantic Coast of the United States is limited. Essential fish habitat for coastal migratory pelagic species such as cobia includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* For cobia, essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat. The Gulf Stream is an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae. Preferred temperatures are greater than 20°C and salinities are greater than 25 ppt.

Cobia are likely to occur only as occasional transient individuals within the vicinity of the Project Site due to its coastal migrations, pelagic nature, and salinity requirements. Therefore, EFH for this species will not be affected by the Proposed Project.

SAND TIGER SHARK (Odontaspis taurus)

The sand tiger shark is a large, coastal marine species found in tropical and warm temperate waters throughout the world and is often found in shallow water (less than 4 m [13 feet]). The lower Bronx River is within an area designated as EFH for larval sand tiger sharks (neonates). Males mature between 190-195 cm (75-77 inches) total length, or four to five years, and females at more than 220 cm (87 inches) or six years. The sand shark has extremely limited reproductive potential, producing only two young per litter measuring approximately 100 cm (39 inches). Embryos, being cannibalistic, consume other embryos until only one from each oviduct survives where each pup grows to be quite large (up to 40 inches) before birth. Neonates, after birth, migrate northward in the summer to estuarine nursery areas (UD 2001). In North America, the species gives birth in March and April and during the winter in the southern portion of its range. Young sand sharks migrate northward to nursery areas of the Mid-Atlantic Bight coastal sounds and estuaries, including: Chesapeake, Delaware, Sandy Hook, and Narragansett Bay.

Overfishing of the large aggregations associated with mating has led to a declining population. The essential fish habitat for young and juvenile sand tiger sharks includes the shallow coastal waters from Barnegat Inlet, New Jersey to Cape Canaveral, Florida to the 25 m (82 feet) isobath (USACE 2000). This species is not expected to occur within the New York/New Jersey Harbor Estuary except as occasional transient individuals. Therefore, EFH for this species will not be affected by the Proposed Project.

DUSKY SHARK (*Carcharhinus obscurus*)

The dusky is a large, coastal species found in tropical and temperate waters throughout the world, and ranges from Nova Scotia to Cuba. It is most often found along continental coastlines where it ranges from shallow inshore waters to the outer continental shelf and adjacent oceanic waters. This species is highly migratory, moving north during the summer and south in the winter. The lower Bronx River designated as EFH for dusky shark larvae (neonates).

In the western Atlantic, mating occurs in the spring. Due to the presence of two size classes of young found in pregnant females off the coast of Florida, it is believed that females of this species only mate every second year. These different size classes suggest alternating birth seasons every two years with a gestation period of eight months or a single season with a longer gestation period of about 16 months. In the western Atlantic, the number of young per litter ranges from six to eight.

Adults tend to avoid areas of low salinity, and rarely enter estuaries. However, dusky sharks are viviparous, and females enter bays and estuaries to drop their pups. After pupping, adult sharks move to deeper waters. The essential fish habitat for dusky shark neonate and early juvenile life stages are the shallow coastal waters, inlets, and estuaries from the eastern end of Long Island, NY south to West Palm Beach, FL to the 100 m isobath. The prime nursery areas are estuaries and bays from Cape Hatteras, North Carolina to New Jersey (Knickle 2001a).

This species is not expected to occur within the New York/New Jersey Harbor Estuary except as occasional transient individuals. Therefore, it is unlikely that this species will be found in the vicinity of the Project Site, and EFH for dusky shark will not be affected by the Proposed Project.

SANDBAR SHARK (Carcharhinus plumbeus)

The sandbar shark is found throughout the world in subtropical and warm temperate waters, and is common to many coastal habitats. It is bottom-dwelling and most commonly found in 20 to 55 m (66-180 feet) waters. The lower Bronx River is within an area designated as EFH for larval and adult sandbar sharks.

The sandbar shark is a slow growing species. Both sexes reach maturity at about 180 cm (71 inches) total length. Estimates of age of maturity range from 15-16 years to 29-30 years, although 15-16 years is the commonly accepted age of maturity. Sandbar sharks produce two litters per year, with each litter consisting of 1 to 14 pups (9 being the average). The gestation period lasts about a year and reproduction is biennial. Young are born at about 60 cm (24 inches) (smaller in the northern parts of the North American range) from March to July. In the United States, the sandbar shark uses estuarine nurseries in shallow coastal waters from Cape Canaveral, Florida, to the northern extent of the range at Great Bay, New Jersey (Merson and Pratt 1997). Bays from Delaware to North Carolina are important nursery areas (Knickle 2001b).

Juveniles return to Delaware Bay after the winter. Neonates have been captured in Delaware Bay in late June. Young-of-the-year are present in Delaware Bay until early October when the temperature falls below 21°C (70°F). Juveniles have been found as far north as Martha's Vineyard, Massachusetts in the summer. Young and juvenile sandbar sharks strongly prefer salinities of greater than 22 ppt and temperatures greater than 21°C (70°F). Essential fish habitat for young and early juvenile sandbar sharks are shallow coastal areas to the 25 m (82 feet) isobath from Montauk, Long Island, New York, south to Cape Canaveral, Florida; nursery areas in shallow coastal waters from Great Bay, New Jersey to Cape Canaveral, Florida; also shallow

coastal waters up to a depth of 50 m (164 feet) on the west coast of Florida and the Florida Keys. This species is not expected to occur within the New York/New Jersey Harbor Estuary except as occasional transient individuals. Therefore, EFH for this species will not be affected by the Proposed Project.

CLEARNOSE SKATE (RAJA EGLANTERIA)

The lower Bronx River is designated as EFH for the adult clearnose skate. North of Cape Hatteras, clearnose skates move inshore and northward along the continental shelf during the spring and early summer and offshore and southward during autumn and early winter. The species occurs off of New Jersey and New York from late April-May and October-November. In the Hudson-Raritan Estuary bottom trawls, the largest numbers were found in the summer, particularly in and near channels and south of Coney Island. Small numbers were collected in the spring and autumn, with very few collected in the winter (Packer 2003a).

This skate is found on soft bottoms along the continental shelf but will also occur on rock or gravelly bottoms. It is most abundant at depths less than 111 meters (364 ft). The Hudson-Raritan trawls found the most abundant adults at depths of 5-8 m (16-26 ft), temperatures between 9 and 24° C (48-75°F), and salinities ranging from 22 to 32 ppt (Packer 2003a). Clearnose skate are not likely to occur in the Lower Bronx River at the project site. Salinities at the project site range from 0 to 2.5 ppt, far below the range required for adult clearnose skates. Additionally, because the project site has a depth of 1.8 meters (6 feet) or shallower, it is not likely the clearnose skate would be found at the project site. Therefore, EFH for this species will not be affected by the Proposed Project.

LITTLE SKATE (LEUCORAJA ERINACEA)

The lower Bronx River is designated as EFH for the juvenile and adult little skates. Little skates do not make extensive migrations but do move onshore and offshore with the seasons-generally to shallow waters in the spring and deeper waters in the winter. Little skates are generally found in gravelly bottoms but can also be found on muddy bottoms. This species are generally found in temperatures are less than about 16-18°C (61-64°F). Adult little skates prefer temperatures ranging from 1 to 17°C (34-63°F), depths from 5 to 16 m (16-52 ft) and salinities from 18 to 32 ppt (but most at ≥25 ppt). In a survey conducted of the New York Bight from 1996-1997, juvenile little skates were collected mostly in the inner continental shelf at mean depths of 40-45 m (131-148 ft), a mean temperature of 8.5°C (47.3°F), and a mean salinity of 32 ppt (Packer 2003b).

The northeastern little skate stock is not currently over fished but it is not known if overfishing of this stock is currently occurring Packer (2003b). Little skates are bottom dwelling and therefore have a potential to be affected by the temporary increases in turbidity. However, because both juvenile and adult little skates prefer salinities and depths that vary greatly from what is found at the project site (1-2.5 ppt salinity and less than 1.8 meter (6 feet) depths), it is not likely the little skate would be found at the project site. Therefore, EFH for this species will not be affected by the Proposed Project.

WINTER SKATE (LEUCORAJA OCCELATA)

The lower Bronx River is designated as EFH for the adult winter skate. This skate is found most often on sandy or gravelly bottoms but can also be found on muddy bottoms. It is most abundant at depths less than 111 meter (364 ft), and is most abundant over a temperature range of -1.2°C

to 19°C (29.8°F to 66°F), and prefers salinities of 32-34 ppt. This species was most abundant in winter. Very few adults were collected in trawl surveys to determine their habitat preferences (Packer 2003c).

The northeastern winter skate stock is not currently overfished but it is not known if overfishing of this stock is currently occurring. Winter skates are bottom dwelling and therefore have a potential to be affected by the temporary increases in turbidity (Packer 2003c). However, because adult winter skates prefer salinities and depths that vary greatly from what is found at the project site (1-2.5 ppt salinity and less than 1.8 meter (6 foot) depths), it is not likely the winter skate would be found at the project site. Therefore, EFH for this species will not be affected by the Proposed Project.

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Attachment 3: Executive Order 11988 Floodplain Analysis

A. INTRODUCTION AND METHODOLOGY

The Bronx River is designated as a regulatory floodway by NYSDEC Environmental Conservation Law. Per Executive Order 11988 and 23 CR 650, a Floodplain Analysis was conducted to ensure that the planned encroachment is the only practicable alternative for the Proposed Project.

Under Section 650.113 of 23 CR 650, a proposed action which includes a significant encroachment shall not be approved unless the FHWA finds that the proposed significant encroachment is the only practicable alternative. These items are addressed in this statement.

- The reasons why the proposed action must be located in the floodplains.
- The alternatives considered and why they were not practicable.
- A statement indicating whether the action conforms to applicable State or local floodplain protection standards.

According to FHWA, a floodplain is defined as the area adjoining a watercourse or water body which has been, or may be, covered by the base flood, 100-year flood, or regional flood. A floodway is the channel of a watercourse, the bed of a water basin, and those portions of the adjoining floodplains that are reasonably required to carry and discharge floodwater and provide water storage during a regional flood. A regulatory floodway is the floodplain area that is reserved in an open manner by federal, state or local requirements, i.e., unconfined or unobstructed either horizontally or vertically, to provide for the discharge of the base flood so that the cumulative increase in water surface elevation is no more than a designated amount (not to exceed 1 foot as established by the Federal Emergency Management Agency (FEMA) for administering National Flood Insurance Program) (23 CFR 650).

PROJECT DESCRIPTION

The Bronx River Greenway project would allow public access to the Bronx River; restore the Bronx River's natural shorelines to the extent possible in this area; enhance the natural qualities of the River and its surrounding areas; provide additional public open space amenities (e.g., bridges over the Bronx River and an open air amphitheater), and provide a resource for people to cycle, walk, run, or skate for transportation, recreation, or exercise. The project would also provide car-free passage for cycling and walking between the Bronx River and West Farms neighborhoods and their associated transit services, schools, and shopping. The project is a major segment in the entire Bronx River Greenway Corridor that extends from the Bronx/Westchester County border to the East River.

Another component of the Proposed Project is the rehabilitation and reconstruction of Starlight Park. Located on the west bank of the river between approximately East 172nd and East 174th Streets, this park is under the ownership jurisdiction of NYCDPR. Currently denuded and closed

to the public, the 8.9-acre park is undergoing contaminated materials remediation by Con Edison. Once the remediation activities have been completed, the Starlight Park and portions of the Greenway will be redeveloped by NYSDOT to provide several active recreational uses including basketball courts, a multi-use playing field (permitted as a soccer field, two baseball diamonds, or performance seating), and various pieces of play equipment. Locations and utilities will be provided for NYCDPR to construct a boathouse at the south end of the park and a restroom and maintenance storage building near East 174th Street. Existing riprap along the shoreline will remain.

Kayak and canoe access will be provided at the southern end of Starlight Park by NYSDOT. A floating dock will provide safe kayak and canoe launching and safe portaging over an existing weir that is exposed during low tide. The floating dock will consist of a ramp system from the top of the slope leading to a platform to be fixed above 100 year storm elevation. One floating dock will be constructed on each side of the weir with a ramp between them and a ramp leading to the fixed platform. This will maximize safety for people entering and exiting canoes and kayaks in all anticipated tide or storm conditions. Some dredging of mudflats may be necessary to accommodate the floating docks; however, all practicable measures will be used to minimize the amount of dredging and impacts due to dredging activities.

B. WHY PROPOSED ACTION MUST BE LOCATED IN FLOODPLAIN

The entirety of the Bronx River Greenway Corridor will provide valuable transportation links and options to the communities it passes through. The Proposed Project will eventually provide a vital link between the Bronx River Greenway Corridor extending from the East River to beyond the Westchester County border (Figure D-1-2). Although it would become a link in the larger network, the project provides significant utility independent of the entire Bronx River Greenway corridor, including car-free passage for cycling and walking between the Bronx River and West Farms neighborhoods and their associated transit services, schools, and shopping. The completed Bronx River Greenway would also provide improved walking and cycling access to the Bronx Zoo, the Bronx Botanical Gardens, various community parks along the Bronx River, and would eventually be part of a connection to and from Manhattan. The Proposed Project will connect to NYCDPR's planned park at the former concrete plant site to the south and to NYCDPR's Bronx River Park (West Farms segment) of the Bronx River Greenway to the north. NYSDOT is coordinating closely with NYCDPR to ensure seamless links between these projects and additional projects linking Soundview Park and Randall's Island to the south and into Westchester County to the north. The Randall's Island connection will link the Bronx River Greenway corridor to the Manhattan Waterfront Greenway. In addition, the Bronx River Greenway corridor intersects the Pelham Parkway Greenway, including Pelham Bay Park, City Island, and Orchard Beach, and the Mosholu Parkway Greenway leading to Van Cortlandt Park and the North County Trail (continuous trail to be constructed from the New York City/Westchester County border up through part of Putnam County). The Proposed Project may also serve as a segment in the evolving East Coast Greenway from Florida to Maine.

C. ALTERNATIVES CONSIDERED AND WHY THEY WERE NOT PRACTICABLE

NO ACTION ALTERNATIVE

The No Action Alternative is an avoidance alternative that would not affect floodplains. However, the goals and objectives of the project would not be met—this portion of the Greenway Corridor would not be completed, the reconstruction of the Starlight Park would not occur, and the connections that the new Bronx River Greenway would provide to other parks would not be realized. Additionally, the provision of the multi-use non-motorized transportation facility, and all of the additional amenities proposed as part of the Proposed Project would not be provided.

D. PROJECT CONFORMATION TO APPLICABLE STATE OR LOCAL FLOODPLAIN PROTECTION STANDARDS

Within the Project Site, the entire shoreline on both sides of the river is characterized by hard shoreline stabilization structures. From East Tremont Avenue to East 172nd Street the shoreline is characterized by a functional armor stone riprap. South of East 172nd Street to the railroad track crossing, the eastern shoreline is characterized by a combination of natural rock shoreline and artificial broken rock riprap. South of the railroad bridge the shoreline is characterized by a combination of sheetpile and concrete bulkhead, and riprap. Between East Tremont Avenue to approximately 300 feet south of I-95 (Cross Bronx Expressway), the 100-year floodplain is primarily limited to the banks of the Bronx River (Figure D-9-1). South of this point the 100-year floodplain varies from 0 to about 200 feet on either side of the river. The loss of most of the river's natural floodplain coupled with the large amount of impervious surfaces bordering the river have resulted in flashy surface water flows and low ground water recharge.

Conversion of impervious surfaces to green space and improved stormwater management practices will improve the water retention and detention ability of the lands. The naturalized shorelines will be constructed so as not to increase flooding or erosion on the site or the surrounding area. As a result of these improvements, the Proposed Project would have no significant adverse impacts to the floodplain. ✷

Attachment 4: Wetlands Finding Executive Order 11990

A. INTRODUCTION

New York State Department of Transportation (NYSDOT) proposes to provide a "Class I" bikeway along the Bronx River from Westchester Avenue to East Tremont Avenue in the Bronx. The Proposed Project includes a floating dock for kayak and canoe access. Some dredging of wetlands may be necessary to accommodate the floating docks. Per Executive Order 11990, this Wetland Finding has been prepared to set forth the basis for a determination that there is no feasible and prudent alternative to impacts to wetlands and that all practical measures to minimize harm to wetlands have been included.

B. PROJECT DESCRIPTION

The Bronx River Greenway project is designed to allow public access to the Bronx River; restore the Bronx River's natural shorelines to the extent possible in this area; enhance the natural qualities of the River and its surrounding areas; provide additional public open space amenities (e.g., bridges over the Bronx River and an open air amphitheater), and provide a resource for people to cycle, walk, run, or skate for transportation, recreation, or exercise. The project will also provide car-free passage for cycling and walking between the Bronx River and West Farms neighborhoods and their associated transit services, schools, and shopping. The project is a major segment in the entire Bronx River Greenway Corridor that extends from the Bronx/Westchester County border to the East River.

Additionally, the Proposed Project will rehabilitate and reconstruct Starlight Park, located on the west bank of the river between approximately East 172nd and East 174th Streets. Currently denuded and closed to the public, the Park and portions of the Greenway will provide recreational uses, including basketball courts, a multi-use playing field (permitted as a soccer field, two baseball diamonds, or performance seating), various pieces of play equipment, as well as a floating dock providing kayak and canoe access.

Some dredging of mudflats and/or littoral zone wetland habitats may be necessary to accommodate the floating docks; however, all practicable measures will be used to minimize the amount of dredging and impacts due to dredging activities.

Since preparation of the Draft DR/EA, extension of the New York City Department of Environmental Protection (NYCDEP) combined sewer overflow (CSO) has been eliminated from the project, and is not considered in this Wetland Finding.

C. DESCRIPTION OF ALTERNATIVES

The Draft Design Report/Environmental Assessment for the project considered three alternatives:

- Null Alternative
- Creation of on-road bikeway route
- Construction of a 1.8 km (1.14 mi) greenway

As part of the alternative development and environmental review for the project, each alternative was evaluated based on the Project Objectives set forth for the project (Project Objectives, Chapter II.D). These include:

- Provide a multi-use path between Westchester Avenue and East Tremont Avenue
- Provide continuity to greenway networks
- Improve traffic operations and high accident rates; reduce congestion and improve air quality

While the Null Alternative and On-Road Bikeway Route would not disturb wetlands, they did not meet the requirements of the Project for providing a safe, route for commuting and recreation. Creation of the Bronx River Greenway meets all criteria for the project, and therefore was chosen as the feasible alternative.

This section summarizes the three alternatives considered for the project, including the two avoidance alternatives that would not impact wetland resources, and the feasible alternative.

AVOIDANCE ALTERNATIVES

Avoidance alternatives would not disturb wetlands. Two have been considered-the Null Alternative and the On-road Bikeway Route Alternative-and are discussed below.

NULL ALTERNATIVE

In this alternative, no major rehabilitation or reconstruction work would be undertaken. Pedestrians would continue to use congested streets and sidewalks for transportation and recreation through the corridor. No improvements would be made to existing intersections or roadways, and access to the Bronx River would not be improved. The Null Alternative will not satisfy the project objectives to create a safe and appealing location for non-motorized recreation and commuting, and to provide continuity to greenway networks.

ON-ROAD BIKEWAY ROUTE

This alternative would provide on-road bicycle routes in the project vicinity. Although this alternative would provide a dedicated facility for bicyclists, users would be traveling directly adjacent to vehicle lanes. An on-road bikeway would not sufficiently satisfy the project objective to encourage cycling among all skill levels in this high volume traffic area. No new provisions would be made for pedestrians or other non-motorized transportation. In addition, State and City owned right-of-way is not sufficient to widen the roadways to provide adequate bicycle lanes without required reconstruction. Therefore, this alternate will not be considered further.

FEASIBLE ALTERNATIVE

CONSTRUCTION OF GREENWAY

This alternative involves the creation a 1.8 km (1.14 mi) multi-use path facility adjacent to the Bronx River between Westchester Avenue and East Tremont Avenue. This segment will provide a location for people to cycle, walk, run or skate for transportation, recreation or exercise and will serve as an intermodal connection to the neighborhood bus and subway lines. This project will also include some work to the adjacent intersections and roadways and the creation of parkland features that are compatible with the surrounding transportation and land uses. The Greenway will also provide a link to the various recreational areas, commercial uses, and institutional facilities in the surrounding community and will enhance the Bronx River's natural qualities. This alternative satisfies all of the project objectives and for this reason is the preferred alternative.

WETLAND IMPACTS

Approximately 120 cubic meters (157 cubic yards) of material in mudflat and/or littoral zone wetlands will have to be dredged for installation of the floating dock. Potential impacts associated with dredging include localized and temporary increases in suspended sediments and temporary loss of benthic macroinvertebrates in the area dredged. Water quality changes associated with these increases in suspended sediment are expected to be minimal and temporary, limited to the immediate area of the activity. Suspended sediments will dissipate shortly after the dredging is completed and the dock piles are driven into place.

Once completed, elements of the Proposed Project will cause minimal amounts of shading over the Bronx River. The proposed three pedestrian bridges crossing over the river create approximately 0.08 HA (0.195 acres) of shading of the river. Cantilevered overlooks will shade approximately 0.012 HA (0.03 acres). The floating dock and fixed platform have the potential to shade 0.22 HA (0.055 acres) of water. While shading could cause an impact on habitat for wetland vegetation and wildlife, the affected areas are small and light will still be able to penetrate from the sides of the narrow structures. The small amount of shading resulting from the Proposed Project will not be expected to result in significant adverse impacts to aquatic biota or wetlands.

MEASURES TO MINIMIZE HARM

NYSDOT will mitigate for the loss of mudflats and/or littoral zone through the creation of wetlands within the Project Site. The type of wetland creation will be determined during the design phase of the Proposed Project, and may include littoral zone, mudflats, and high marsh habitats. Wetland restoration activities, including invasive species removal and native species planting, will also improve the quality of wetlands within the project site.

Bulkhead and riprap will be removed, where feasible, and parts of the shoreline will be graded, naturalized, and stabilized with plantings. Areas temporarily disturbed during construction and restoration work will be restored to the original or improved condition through proper grading, and all temporary structures and materials will be removed following construction. Designated wetlands areas to be protected will be prominently marked or barricaded.

Adjacent to the New York City Marshall Impound Lot (also referred to as PDJ Simone), the bulkhead and 420 cubic meters (550 cubic yards) of fill material will be removed to grade and

naturalize the shoreline, and stabilize the area with plantings. Additionally, 330 cubic meters (432 cubic yards) of fill material will be removed from the Apex Auto property shorelines, and the area will be graded, naturalized, and stabilized with plantings.

Naturalization of shorelines will help to improve stormwater retention, resulting in improved water quality, and will improve habitat for birds and mammals that use riparian and wetland habitats. The intertidal wetlands created during shoreline naturalization will provide habitat for macroinvertebrates and fish. During low tides, exposed intertidal habitat will provide feeding and resting areas for wading and shorebirds.

D. CONCLUSION

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. ✷