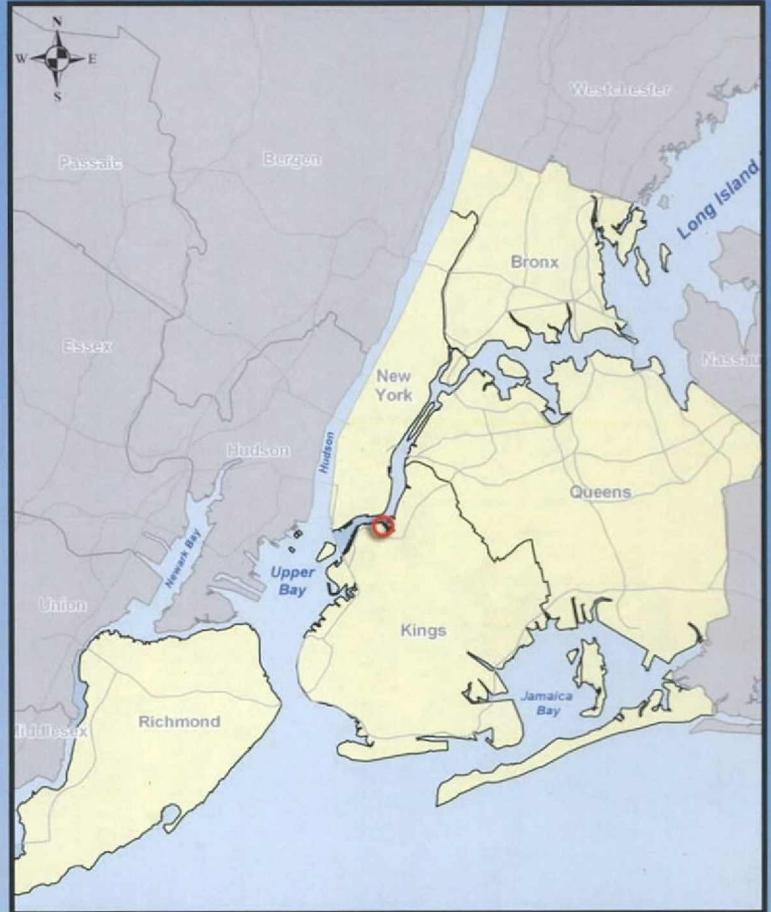


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Archaeological Monitoring Report  
Red Hook Water Pollution Control Plant System Upgrade  
Brooklyn, Kings County, New York City, New York

NYP  
2008



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**TABLE OF CONTENTS**

**TABLE OF CONTENTS**..... i  
**LIST OF MAPS**..... ii  
**LIST OF PHOTOGRAPHS**..... ii  
**PROJECT OVERVIEW**.....1  
    **Introduction**..... 1  
    **Project Information** ..... 1  
    **Previous Studies** ..... 1  
**MONITORING FIELDWORK**.....2  
    **Results** ..... 2  
        **Previous Disturbance**..... 3  
        **Soils** ..... 3  
        **Cultural Material**..... 4  
**CONCLUSIONS**.....4  
**REFERENCES CITED** .....5  
**MAPS**.....6  
**PHOTOGRAPHS**.....12

**LIST OF MAPS**

**Map 1.** General map of the New York City area showing the location of the Red Hook WPCP system upgrade project..... 7

**Map 2.** Detail of the 1979 USGS *Brooklyn 7.5' Topographic Quadrangle, New York* showing the location of the APE. .... 8

**Map 3.** Location of the APE, showing block and lot information. .... 9

**Map 4.** Aerial view of the APE. Note the other WPCP facilities to the immediate east of the APE. .... 10

**Map 5.** General view of project APE showing photograph angles. .... 11

**LIST OF PHOTOGRAPHS**

**Photo 1.** Panoramic view of the Red Hook WPCP substation during system upgrade, facing southwest. Note the existing generator and switching equipment..... 13

**Photo 2.** General view of construction activities within the APE, facing south. Note the concrete and wooden construction debris from the original 1980s construction of the substation present in the fill. .... 14

**Photo 3.** Detail of construction disturbance within the APE, facing east. The foundations of the existing generating and switching equipment at the site are visible, and the surface of an existing metal conduit box connecting the equipment has been exposed in the center of the frame. The bottom of the conduit is approximately 152 cm (60 in) beneath the modern ground surface..... 15

**Photo 4.** Detail of a typical profile exposed during construction, facing north. The three stratigraphic fill levels encountered across the extent of the APE and their approximate depths below the modern ground surface are marked in the photograph. The excavation terminated approximately 85 cm (33.5 in) below the modern ground surface..... 16

**Photo 5.** View of construction activities, facing southwest. Note the existing generating and switching equipment in the background and the exposed conduits visible in the foreground. .... 17

## PROJECT OVERVIEW

### Introduction

The New York Power Authority ("Authority" or "NYPA") is financing system upgrades at the Red Hook Water Pollution Control Plant ("WPCP") substation, located at 63 Flushing Avenue, Unit 101, in the Borough of Brooklyn, Kings County, New York City, New York (Maps 1 and 2). In accordance with the City Environmental Quality Review ("CEQR"), the Authority's client for this undertaking, the New York City Department of Environmental Protection ("NYCDEP"), is required to assess, disclose, and mitigate the impacts of the proposed upgrades to historic resources.

On behalf of its client, the Authority has requested that the City of New York Landmarks Preservation Commission ("LPC") review the proposed upgrades at the site to determine if historic resources will be impacted by construction at the WPCP substation. In a letter dated October 13, 2006, the LPC concurred with the Authority's assessment that no architectural resources would be impacted by the proposed upgrades, but requested additional archaeological monitoring of the construction activities at the site. As requested, this report presents the results of archaeological monitoring conducted during construction at the WPCP substation.

### Project Information

The Authority proposes to fund electric service upgrades at the WPCP substation. The WPCP is a large wastewater treatment facility on the East River, operated by the lead agency for this project, the NYCDEP (Photo 1). The facility is designed to treat sewage and dewater the heavy fraction before discharging the water fraction into harbor waterways in accordance with a State Pollution Discharge Elimination System permit. The WPCP facility includes primary and secondary settling tanks, disinfection facilities, and a main building housing offices, equipment, and controls. The substation currently in operation at the site provides electricity and emergency power generation for the WPCP. The substation is situated within the Brooklyn Navy Yard ("BNY"), approximately 40 feet (12 m) east of the intersection of Little Street and Evans Street in the Borough of Brooklyn. The BNY (formerly the New York Naval Shipyard), was purchased by the City of New York in 1967 and currently functions as an industrial park, operated by the Brooklyn Navy Yard Development Corporation.

The Authority proposes to replace unreliable turbine generators at the WPCP substation with diesel engine-driven generators and to upgrade the distribution facilities. The proposed undertaking entails the construction of a new, one-story, 550 square foot (51 square meter) structure to house new batteries required for substation operation. The switchgear enclosures at the substation will also be consolidated and replaced in order to make room for the new equipment, and an additional 50-foot (15-m) tall lightning mast will be installed. Additionally, a 70-foot (21.3-m) tall exhaust stack with a 24 inch (61 cm) diameter is to be installed at the northeast end of the substation in order to meet air quality regulation requirements. Ground-disturbing activities associated with the project will be limited to the footprint of the current substation and adjacent sections of the First Avenue roadway where ductbanks will be installed. Ground-disturbing activities will not extend further than approximately 4 feet (1.2 m) beneath the modern ground surface. In total, the Area of Potential Effect ("APE") for the Red Hook WPCP substation upgrade project is approximately 0.81 acres (0.33 ha). This APE includes the substation and the associated ductbanks which connect the substation to nearby WPCP facilities (Maps 3, 4, and 5).

### Previous Studies

The Authority submitted documentation for an initial LPC review of the project on May 1, 2006. In a letter dated May 15, 2006, the LPC determined that the proposed upgrades could disturb potentially

significant archaeological resources, and requested that the Authority prepare a Phase IA archaeological documentary study and site history for the WPCP project.

At the request of the LPC, the Authority submitted a report on September 19, 2006, entitled: *Phase IA Documentary Study and Site History, Red Hook Water Pollution Control Plant System Upgrade, Brooklyn, Kings County, New York City, New York*. The report was prepared by the Authority's Cultural Resource Specialist, Robert J. Quiggle, MA, RPA, and included an examination of soils, bedrock, and topography; a review of previous archaeological investigations in the vicinity of the WPCP; an analysis of soil borings taken in and adjacent to the existing WPCP substation, and a historical map review.

The Phase IA study determined that the APE is situated within the historic boundary of the New York Naval Shipyard and adjacent to Quarter's A, a National Historic Landmark ("NHL"). While resources within the New York Naval Shipyard have previously been determined to be eligible for inclusion in the National Register of Historic Places ("National Register"), these properties are not within the APE. Similarly, the Quarters A NHL is located adjacent to the WPCP substation, but does not include any portion of the APE.

The Phase IA report also determined that intact Native American or early Euroamerican features, deposits, or in-situ artifacts may potentially be present within the upper strata of natural soils where these exist beneath the layers of fill. Additionally, as noted in previous reports consulted for the Phase IA study, unknown human remains from prisoners of war buried in the tidal area around Wallabout Bay during the American Revolution may still exist in the natural soils beneath the fill (Geismar and Oberon 1996:22). Despite the efforts of local inhabitants to relocate these remains during the 19<sup>th</sup> century, it is possible that they were not all removed.

While the vicinity of the WPCP was determined to be an archaeologically sensitive area, the Authority concluded that potential for this project to impact significant archaeological resources was considered low, because of previous ground disturbance and filling episodes. The APE is not designated as an archaeologically sensitive area by the New York State Historic Preservation Office, and the amount of prior ground disturbance and fill appear to have significantly disturbed or buried natural soils. Nonetheless, the Authority's Cultural Resource Specialist recommended Phase IB field monitoring for construction activities at the substation, and a monitoring protocol was included in the Phase IA report. In a letter dated October 12, 2006, the LPC concurred with the recommendations of the Phase IA report, and requested that the findings of the monitoring work be submitted to the LPC for review.

## **MONITORING FIELDWORK**

Based on the Phase IA report, significant ground disturbance and filling likely occurred across the extent of the site during initial WPCP construction during the 1980s. The principal goal of the monitoring fieldwork was to document and confirm the expected ground disturbance and fill deposits, and to collect any artifacts or cultural material related to the 19<sup>th</sup>-century occupation of the site present in the fill. Disarticulated building materials or construction debris were noted, but not collected. Robert Quiggle, MA, RPA conducted the archaeological monitoring at the WPCP substation site during the week of April 1, 2007. The weather was overcast and humid, with seasonal temperatures in the mid-60s.

### **Results**

As anticipated, the excavation profile across the site exhibited significant fill deposits and prior disturbance related to the construction of the WPCP during the 1980s. Scattered construction debris was observed in the fill, but was not collected. No additional cultural material was encountered during field monitoring.

### Previous Disturbance

The original construction at the WPCP required placing a network of conduits and ductbanks throughout and adjacent to the substation at a depth of up to 8 feet (2.4 m) beneath the modern ground surface; installing generators, lightning masts, and switchgear on concrete foundations; and constructing a brick and wrought iron wall to separate the substation from other WPCP facilities. The substation and electrical equipment were built and installed by Schiavone Construction Company and Daidone Electric, both of New York City, and the project was completed in 1985.

Monitoring fieldwork confirmed that the original construction of the WPCP substation during the 1980s resulted in significant ground disturbance (Photo 2). The large concrete foundations that currently support the existing generators and switching equipment extend at least 4 feet (1.2 m) beneath the modern ground surface, and the tops of metal conduits were visible beneath these foundations (Photos 3 and 5). The concrete foundations rest on treated wood pilings. This subsurface disturbance was documented in the WPCP substation as-built drawings, and confirmed by field monitoring (NYPA 2006). Based on the information compiled in the previous Phase IA report and the archaeological field monitoring, subsurface disturbance appears to extend to a minimum depth of 6 feet (1.8 m) beneath the modern ground surface for the entire extent of the APE (NYPA 2006). Ground disturbance appears to extend to a maximum depth of 8 feet (2.4 m) in some areas.

### Soils

Strictly speaking, a developed soil sequence was not encountered during monitoring, as the profile appeared to consist entirely of unaltered, unweathered, anthropogenic fill material (Waters 1992). Excavations reached a depth of approximately 5 feet (1.2 m), and three different stratigraphic levels were encountered. The depth, Munsell Soil color chart description (Munsell 2000), and the texture of each level were recorded in the field (Photo 4). The typical profile observed across the APE is detailed in Table 1, below.

Level	Depth below modern ground surface (in/cm)	Munsell description	Texture	Notes
1	0–13.8 in /0–35 cm	10YR 4/6 dark yellowish brown	Gravelly coarse sand with construction debris	Fill material
2	13.8–23.6 in /35–60 cm	10YR 5/6 yellowish brown	Coarse sand	Fill material
3	23.6–60 in /60–152 cm	10YR 6/6 brownish yellow	Medium sand	Fill material

The different levels of anthropogenic fill material represented in the observed profile likely represent filling episodes associated with the original construction of the WPCP substation. It is likely that the denser, medium sand visible in level three was deposited to form a suitable base for the existing concrete foundations and conduits which were installed in the 1980s. The remaining fill material in level two was likely deposited to fill the space between the foundations and the conduits, and the gravelly coarse sand which forms the modern ground surface within the existing WPCP substation (level one) was deposited to facilitate drainage. All levels contained scattered construction debris which was not collected.

The profile observed during archaeological monitoring was slightly different than the Laguardia and Ebbets soils that were mapped in the vicinity of the APE by the New York City Soil Survey (“NYCSS”) in 2005 (NYCSS 2005). While sharing anthropogenic fill as a parent material, the Laguardia-Ebbets complex soils are consistent with a more mature soil profile than the sediments observed within the APE (NYCSS 2005). The stability necessary to achieve soil formation from the parent fill has not yet

occurred at the WPCP substation, resulting in a profile different from the Laguardia-Ebbets complex (Waters 1992).

### *Cultural Material*

Scattered construction debris was the only cultural material encountered during archaeological monitoring at the WPCP substation. The construction debris was found throughout the fill, and included brick fragments, plastic sheeting, and wood. No artifacts, deposits or features related to the Prehistoric or Historic period occupation of the site were encountered. The construction debris was noted in the field, but was not collected.

### **CONCLUSIONS**

On behalf of its client, the Authority has requested that the LPC review the proposed upgrades at the site to determine if historic resources will be impacted by rehabilitation of the WPCP substation. At the recommendation of the Authority's Cultural Resource Specialist and the LPC, the Authority conducted archaeological monitoring of construction activities within the APE. The archaeological monitoring confirmed that significant disturbance had occurred during the original construction of the WPCP in the 1980s. An examination of the sediments encountered during excavations revealed that at least 5 feet (1.5 m) of sandy fill were deposited within the APE during original construction. No artifacts, features, or deposits related to the Prehistoric or Historic occupation of the area were encountered during monitoring, and the construction activity was restricted to the fill material within the previously-disturbed APE. No further archaeological studies are recommended for the WPCP substation system upgrade.

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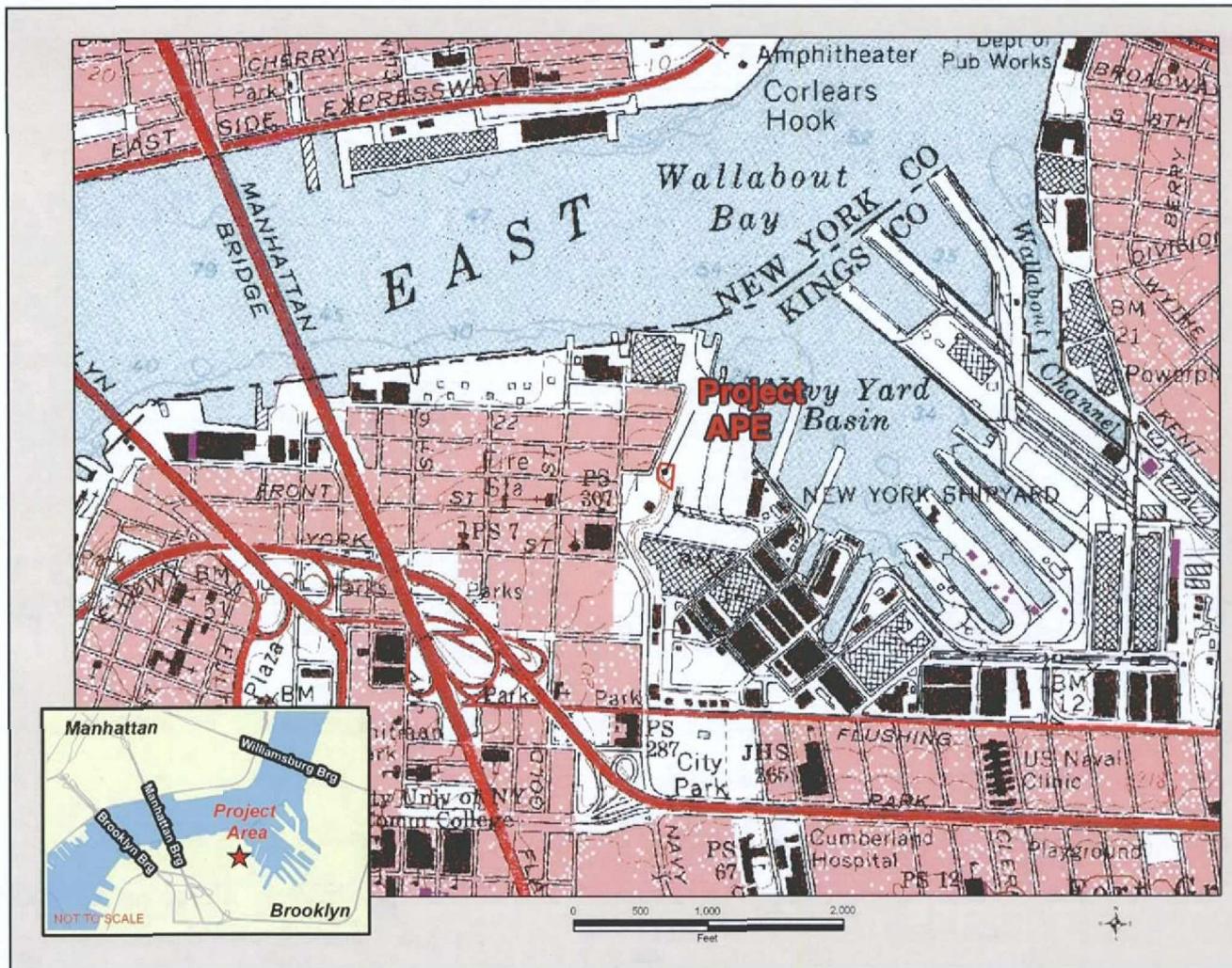
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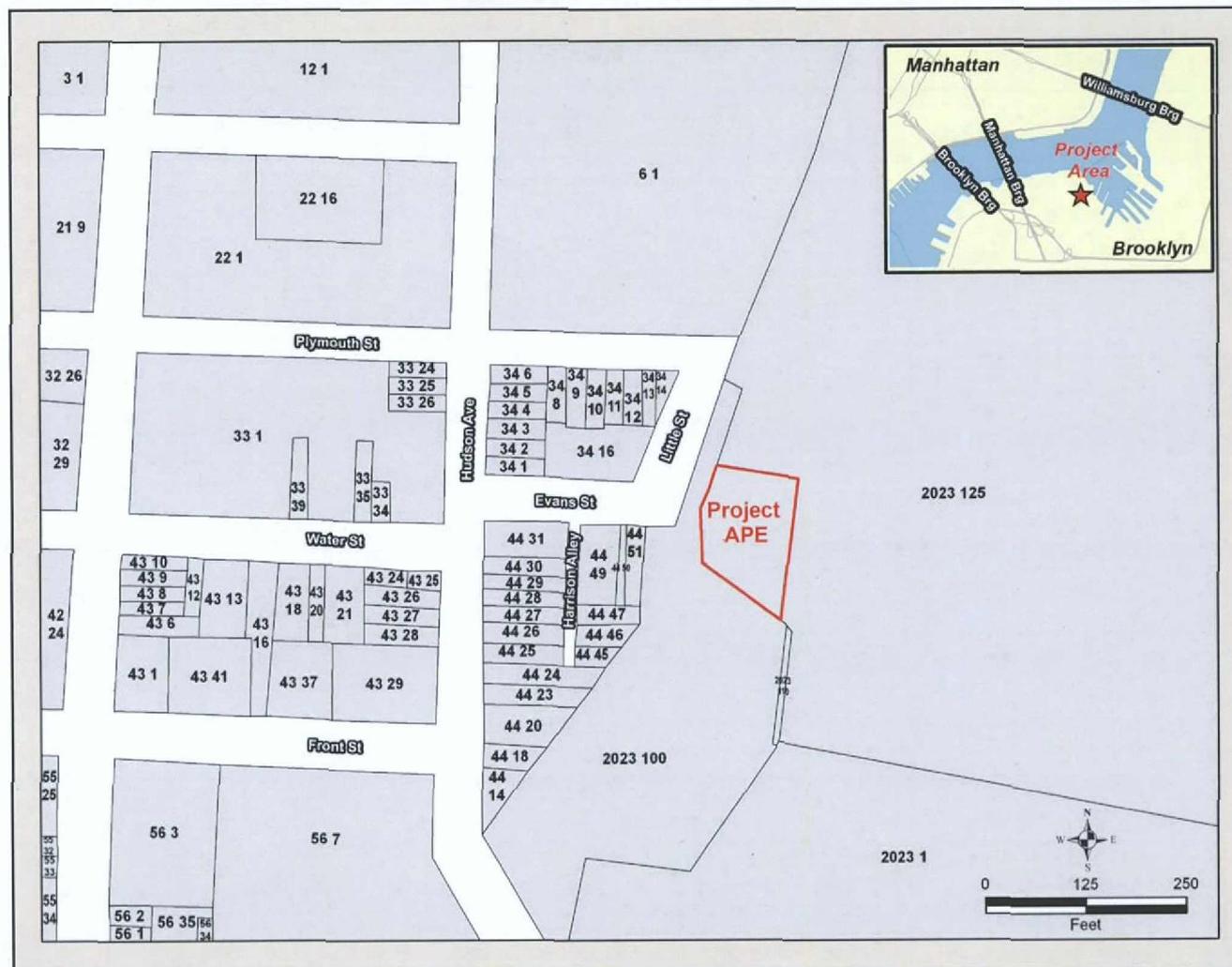
**MAPS**



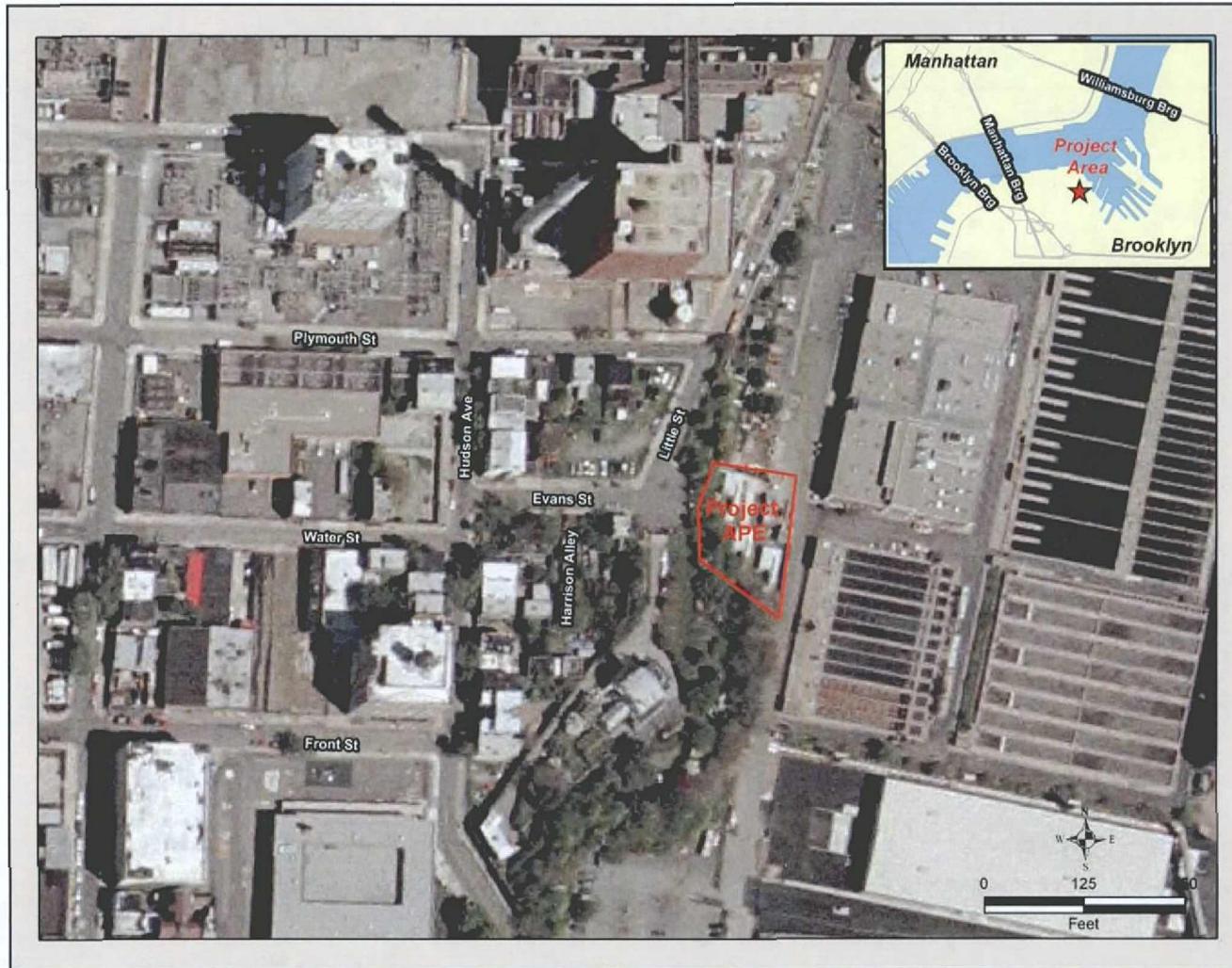
Map 1. General map of the New York City area showing the location of the Red Hook WPCP system upgrade project



Map 2. Detail of the 1979 USGS Brooklyn 7.5' Topographic Quadrangle, New York showing the location of the APE.



Map 3. Location of the APE, showing block and lot information.



Map 4. Aerial view of the APE. Note the other WPCP facilities to the immediate east of the APE.



**PHOTOGRAPHS**



**Photo 1.** Panoramic view of the Red Hook WPCP substation during system upgrade, facing southwest. Note the existing generator and switching equipment.



Photo 2. General view of construction activities within the APE, facing south. Note the concrete and wooden construction debris from the original 1980s construction of the substation present in the fill.



**Photo 3. Detail of construction disturbance within the APE, facing east. The foundations of the existing generating and switching equipment at the site are visible, and the surface of an existing metal conduit box connecting the equipment has been exposed in the center of the frame. The bottom of the conduit is approximately 152 cm (60 in) beneath the modern ground surface.**



Photo 4. Detail of a typical profile exposed during construction, facing north. The three stratigraphic fill levels encountered across the extent of the APE and their approximate depths below the modern ground surface are marked in the photograph. The excavation terminated approximately 85 cm (33.5 in) below the modern ground surface.



**Photo 5. View of construction activities, facing southwest. Note the existing generating and switching equipment in the background and the exposed conduits visible in the foreground.**