

**AVENUE V PUMPING STATION
ENVIRONMENTAL ASSESSMENT
STATEMENT**

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City Environmental Quality Review

ENVIRONMENTAL ASSESSMENT STATEMENT
PART I, GENERAL INFORMATION

Reference Numbers

1. 98 DEP 031K
CEQR REFERENCE NUMBER (TO BE ASSIGNED BY LEAD AGENCY)
ULURP REFERENCE NO. IF APPLICABLE

BSA REFERENCE NO. IF APPLICABLE
OTHER REFERENCE NO. (S) IF APPLICABLE (e.g., Legislative Intro, CAPA, etc.)

Lead Agency &

2a. LEAD AGENCY
New York Department of Environmental Protection
NAME OF LEAD AGENCY

2b. APPLICANT INFORMATION
SAME
NAME OF APPLICANT

Applicant Information
PROVIDE APPLICABLE INFORMATION

Angela Licata, Assistant Commissioner
NAME OF LEAD AGENCY CONTACT PERSON
59-17 Junction Boulevard, 11th floor
ADDRESS
Flushing New York 11371-5108
CITY STATE ZIP
718-595-4398 718-595-4479
TELEPHONE FAX
alicata@dep.nyc.gov
EMAIL ADDRESS

NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON
ADDRESS
CITY STATE ZIP
TELEPHONE FAX
EMAIL ADDRESS

Action Description
SEE CEQR MANUAL SECTIONS 2A & 2B

3a. NAME OF PROPOSAL Avenue V Pumping Station and Force Mains
3b. DESCRIBE THE ACTION(S) AND APPROVAL(S) BEING SOUGHT FROM OR UNDERTAKEN BY CITY (AND IF APPLICABLE, STATE AND FEDERAL AGENCIES) AND, BRIEFLY, DESCRIBE THE DEVELOPMENT OR PROJECT THAT WOULD RESULT FROM THE PROPOSED ACTION(S) AND APPROVAL(S): See Attachment A, "Project Description."

3c. DESCRIBE THE PURPOSE OF AND NEED FOR THE ACTION(S) AND APPROVAL(S): See Attachment A, "Project Description."

Required Action or Approvals

4. CITY PLANNING COMMISSION [] Yes [x] No
[] Change in City Map [] Zoning Certification [] Site Selection - Public Facility
[] Zoning Map Amendment [] Zoning Authorization [] Disposition - Real Property
[] Zoning Text Amendment [] Housing Plan & Project [] UDAAP [] Revocable Consent [] Concession
[] Charter 197-a Plan
[] Zoning Special Permit, specify type:
[] Modification of:
[] Renewal of:
[] Other:

5. UNIFORM LAND USE PROCEDURE (ULURP) [] Yes [x] No

6. BOARD OF STANDARDS AND APPEALS [] Yes [x] No
[] Special Permit [] New [] Renewal Expiration Date
[] Variance [] Use [] Bulk
Specify affected section(s) of Zoning Resolution

7. DEPARTMENT OF ENVIRONMENT PROTECTION [x] Yes* [] No
* To permit the rehabilitation of the Avenue V Pumping Station and construction of Force Mains.
Title V Facility [] Power Generating Facility [] Medical Waste Treatment Facility

8. OTHER CITY APPROVALS G Yes No
[] Legislation [] Rulemaking: specify agency:
G Construction of Public Facilities* [] Funding of Construction. Specify G Funding of Programs. Specify
[] Policy or plan [] Permits, Specify:
Other: explain:

PLEASE NOTE THAT MANY ACTIONS ARE NOT SUBJECT TO CEQR. SEE SECTION 110 OF TECHNICAL MANUAL.

9. STATE ACTIONS/APPROVALS/FUNDING Yes No
If "Yes," identify See Table EAS I-9.
10. FEDERAL ACTIONS/APPROVALS/FUNDING Yes No
If "Yes," identify _____

Action Type

- 11a. Unlisted; or Type I: specify category (see 6 NYCRR 617.4 and NYC Executive Order 91 of 1977, as amended):
More than 10 acres disturbance.

Analysis Year

- 11b. Localized action, site specific Localized action, change in regulatory control for small area Generic action
12. Identify the analysis year (or build year) for the proposed action 2012
Would the proposal be implemented in a single phase? Yes No NA
Anticipated period of construction: Approximately 73 months.
Anticipated completion date: December 2011
Would the proposal be implemented in multiple phases? Yes No NA.
Number of phases: 2
Describe phases and construction schedule: Pumping Station (November 2005-April 2011); 54 months
Force Mains (July 2007-December 2011); 54 months

Directly Affected Area

INDICATE LOCATION OF PROJECT SITE FOR ACTIONS INVOLVING A SINGLE SITE ONLY (PROVIDE ATTACHMENTS AS NECESSARY FOR MULTIPLE SITES)

- 13a. LOCATION OF PROJECT SITE
76 Avenue V

STREET ADDRESS
Avenue V Pumping Station: Between West 11th and 86th Streets, Brooklyn.
Proposed Dry Weather Force Main Route: The dry weather force main would run west under Avenue V (between 86th Street and Stillwell Avenue) to 27th Avenue (between Stillwell and Cropsey Avenues) to Cropsey Avenue (between Cropsey Avenue and Bay 40th Street) to Bay 40th Street (between Cropsey Avenue and Shore Parkway) to the northern shoulder of Shore Parkway (between Bay 40th Street and the Verrazano-Narrows Bridge). The force main would terminate at and connect to a constructed, but not currently used sewer in proximity to the Verrazano Narrows Bridge.
Proposed Wet Weather Force Main Route: The proposed wet weather force main follows the path of the proposed dry weather main from Avenue V to Shore Parkway and then along Shore Parkway approximately one mile to Bay 16th Street. At that point, the wet weather force main would turn northeast from the Shore Parkway and run under Bay 16th Street to Bath Avenue. At Bath Avenue, it would turn northwest and continue one block terminating at Regulator 9A under the intersection of Bath Avenue and 17th Avenue.

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS
Avenue V pumping Station: R-5
Proposed Force Main Routes: R-5, R-6, and R-4 22b, 28a, 28c
EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION, IF ANY ZONING SECTIONAL MAP NO
Block 7140, Lot 1 13 (pumping station & 4,900 feet of force main route)
11 (8,200 feet of wet weather and 8,400 of dry weather force main route)
10 (5,200 feet of dry weather force main)
Brooklyn
TAX BLOCK AND LOT NUMBERS BOROUGH COMMUNITY DISTRICT NO.

- 13b. PHYSICAL DIMENSIONS AND SCALE OF PROJECT
TOTAL CONTIGUOUS SQUARE FEET OWNED OR CONTROLLED BY PROJECT SPONSOR 40,000 SQ. FT.

PROJECT SQUARE FEET TO BE DEVELOPED
Pumping Station: ±13,840 square feet (all buildings)
Dry weather force main: ±18,500 linear feet
Wet weather force main: ±13,100 linear feet
Gross floor area of project: SQ. FT.
Pumping Station: ±4,450 square feet (Main Building only)
Dry weather force main: ±18,500 linear feet
Wet weather force main: ±13,100 linear feet

IF THE ACTION IS AN EXPANSION, INDICATE PERCENT OF EXPANSION PROPOSED
IN THE NUMBER OF UNITS, SQ. FT. OR OTHER APPROPRIATE MEASURE N/A % OF N/A
DIMENSIONS (IN FEET) OF LARGEST PROPOSED STRUCTURE: Approx. 30 ft. HEIGHT 57 feet WIDTH 78 feet LENGTH
LINEAR FEET OF FRONTAGE ALONG A PUBLIC THOROUGHFARE: Avenue V Pumping Station: 200 feet along Avenue V and 200 feet along West 11th Street
Dry weather force main route: ±18,500 feet; Wet weather force main: ±13,100 feet

- 13c. IF THE ACTION WOULD APPLY TO THE ENTIRE CITY OR TO AREAS THAT ARE SO EXTENSIVE THAT A SITE-SPECIFIC DESCRIPTION IS NOT APPROPRIATE OR PRACTICABLE, DESCRIBE THE AREA LIKELY TO BE AFFECTED BY THE ACTION:
N/A

- 13d. DOES THE PROPOSED ACTION INVOLVE CHANGES IN REGULATORY CONTROLS THAT WOULD AFFECT ONE OR MORE SITES NOT ASSOCIATED WITH A SPECIFIC DEVELOPMENT? Yes No

IF "YES," IDENTIFY THE LOCATION OF THE SITES PROVIDING THE INFORMATION REQUESTED IN 13a & 13b ABOVE

Table EAS I-9
New York State Permits Required for Proposed Action

Form	Description	Agency
Force Main		
95-19-3 and Checklist	Long Island Well	NYSDEC
Coastal Zone Assessment	Coastal Management	NYSDOS
Pumping Station		
NOI	Construction SPDES	NYSDEC
NYC Air Pollution Code	Air Emission Registration	DEP
Source: Hazen & Sawyer, P.C, AKRF, Inc.		

PART II, SITE AND ACTION DESCRIPTION

Site Description

EXCEPT WHERE OTHERWISE INDICATED, ANSWER THE FOLLOWING QUESTIONS WITH REGARD TO THE DIRECTLY AFFECTED AREA. THE DIRECTLY AFFECTED AREA CONSISTS OF THE PROJECT SITE AND THE AREA SUBJECT TO ANY CHANGE IN REGULATORY CONTROLS.

1. **GRAPHICS** Please attach: (1) a Sanborn or other land use map; (2) a zoning map; (3) a tax map. On each map, clearly show the boundaries of the directly affected area or areas and indicate a 400-foot radius drawn from the outer boundaries of the project site. The maps should not exceed 8 1/2 x 14 inches in size.

See Figures 1A, 1B, 2, 3, 4A, 4B, 4C, 4D, and 4E.

2. **PHYSICAL SETTING** (both developed and undeveloped areas)

Total directly affected area (sq. ft.):	Avenue V pumping station site: 40,000 square feet Dry weather force main: ±18,500 linear feet Wet weather force main: ±13,100 linear feet	Water surface area (sq. ft.):	N/A
Roads, building and other paved surfaces (sq. ft.):	Pumping station: 40,000 square feet Dry weather force main: 5,000 feet paved and 13,500 feet unpaved Wet weather force main: 6,500 feet paved and 6,600 feet unpaved	Other, describe (sq. ft.):	N/A

3. **PRESENT LAND USE**

Residential

Total no. of dwelling units N/A No. of low-to-moderate income units _____
 No. of stories _____ Gross floor area (sq. ft.) _____
 Describe type of residential structures: _____

Commercial

Retail: No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 Office: No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 Other: No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 Specify type(s): _____ No. of stories and height of each building: _____

Manufacturing/Industrial

No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 No. of stories and height of each building: _____
 Types of use(s): _____
 Open storage area (sq. ft.) _____

If any unenclosed activities, specify: _____

Community facility

Type of community facility: N/A
 No. of bldgs. _____ Gross floor area of each building (sq. ft.): _____
 No. of stories and height of each building: _____

Vacant Land

Is there any vacant land in the directly affected area? Yes No
 If yes, describe briefly: _____

Publicly accessible open space

Is there any existing publicly accessible open space in the directly affected area? Yes No
 If yes, describe briefly: _____

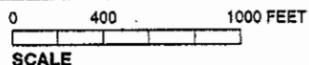
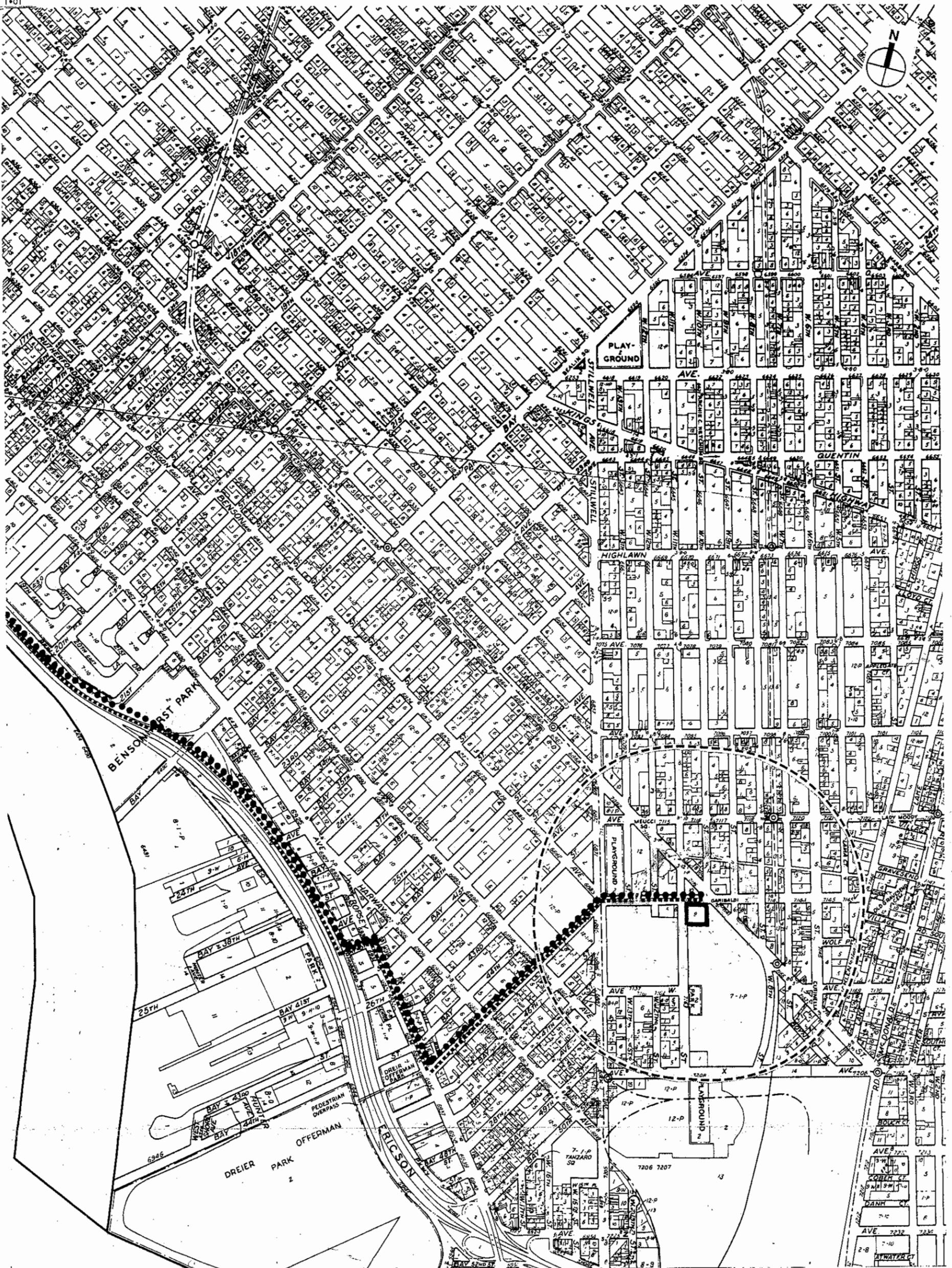
Does the directly affected area include any mapped City, State or Federal parkland? Yes No
 If yes, describe briefly: _____

The directly affected parkland is the proposed force main routes. Left Ericson Drive (Shore Parkway) is mapped parkland from Fort Hamilton Parkway to Knapp Street. The force main would be buried in the parkland.

Does the directly affected area include any mapped or otherwise known wetland? Yes No
 If yes, describe briefly: _____

Other Land Use

Utility: pumping station and force main.
 All 5 structures are one story. The Main Building, Wet Well, and Switchboard Room have a common substructure that also houses the Crew's Quarters. Pump Room B and the Storage Building are independent structures.
 No. of stories _____ Gross floor area (sq. ft.): **5 buildings: ±13,840**
 Type of use(s): **Utility: pump rooms, mechanical, storage, and maintenance facilities.**



SCALE

- Avenue V Pumping Station
- Proposed Dry Weather Flow Force Main
- Proposed Wet Weather Flow Force Main
- Study Area Boundary (1/4-Mile Perimeter)

Open-Land Uses

- Vacant Land
- Used Automobile Lot
- Farm
- Licensed Junk Yard
- Accessory Parking Lot
- Licensed Parking Lot
- Park & Outdoor Recreation

Residential Uses

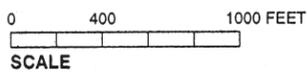
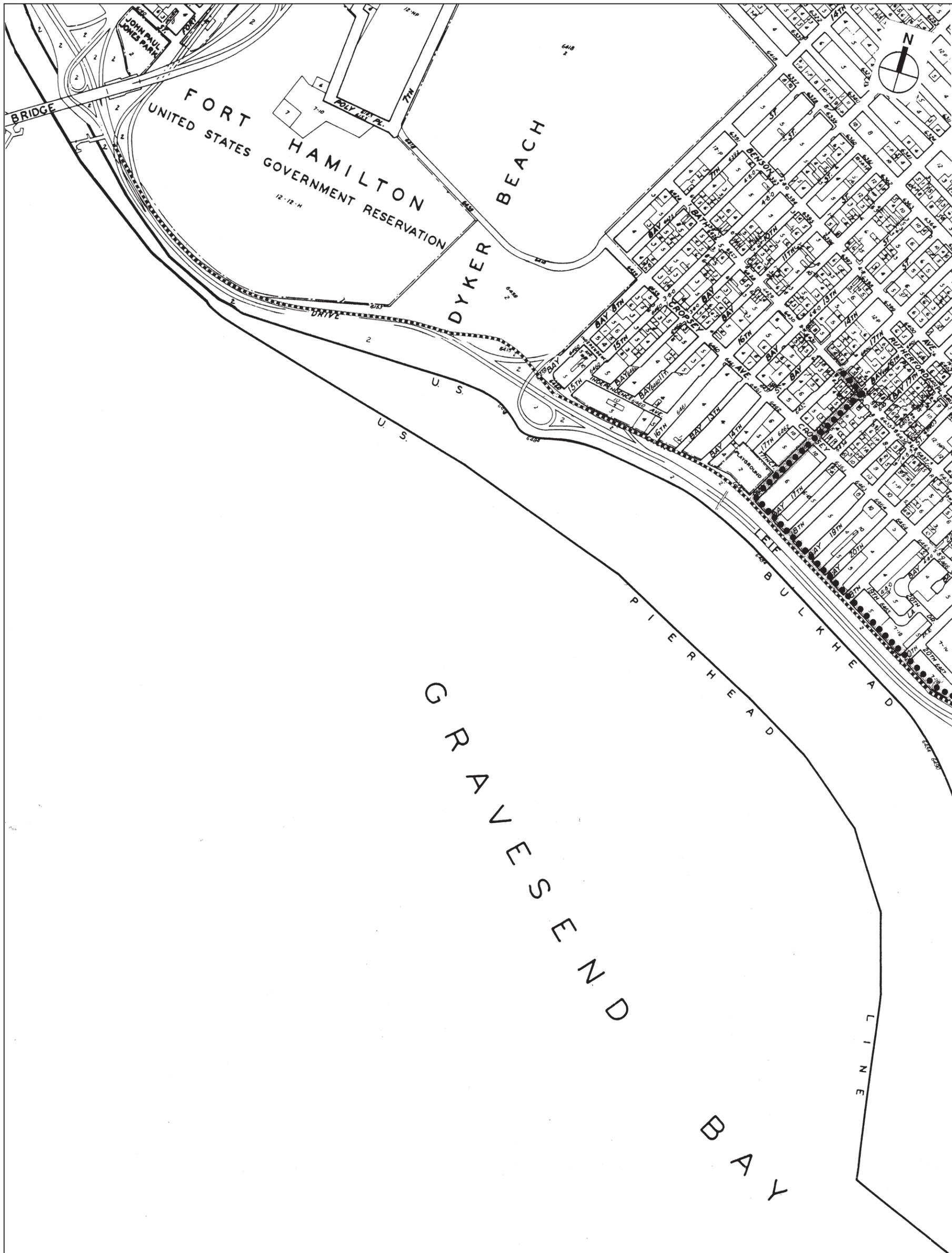
- One-Family Detached
- One-Family Attached
- Two-Family
- Walk-Up Multiple
- Elevator Multiple
- Ground-Floor Retail
- Hotel

Non-Residential Uses

- Commercial & Retail
- Office
- Light Industry
- Warehouse & Storage Yard
- Automobile Storage & Service
- Heavy Industry
- Public & Private Institutions
- Transportation
- Predominant Use Is Followed by Subordinate Uses

**AVENUE V
PUMPING
STATION**

Land Use
Figure 1A



SCALE

..... Proposed Dry Weather Flow Force Main Route

●●●●● Proposed Wet Weather Flow Force Main Route

(For continuation of map, see Figure B-1A)

Open-Land Uses

- 1 Vacant Land
- 1-A Used Automobile Lot
- 1-F Farm
- 1-J Licensed Junk Yard
- 1-P Accessory Parking Lot
- 1-P Licensed Parking Lot
- 2 Park & Outdoor Recreation

Residential Uses

- 3 One-Family Detached
- 4 One-Family Attached
- 5 Two-Family
- 6 Walk-Up Multiple
- 7 Elevator Multiple
- Ground-Floor Retail
- H Hotel

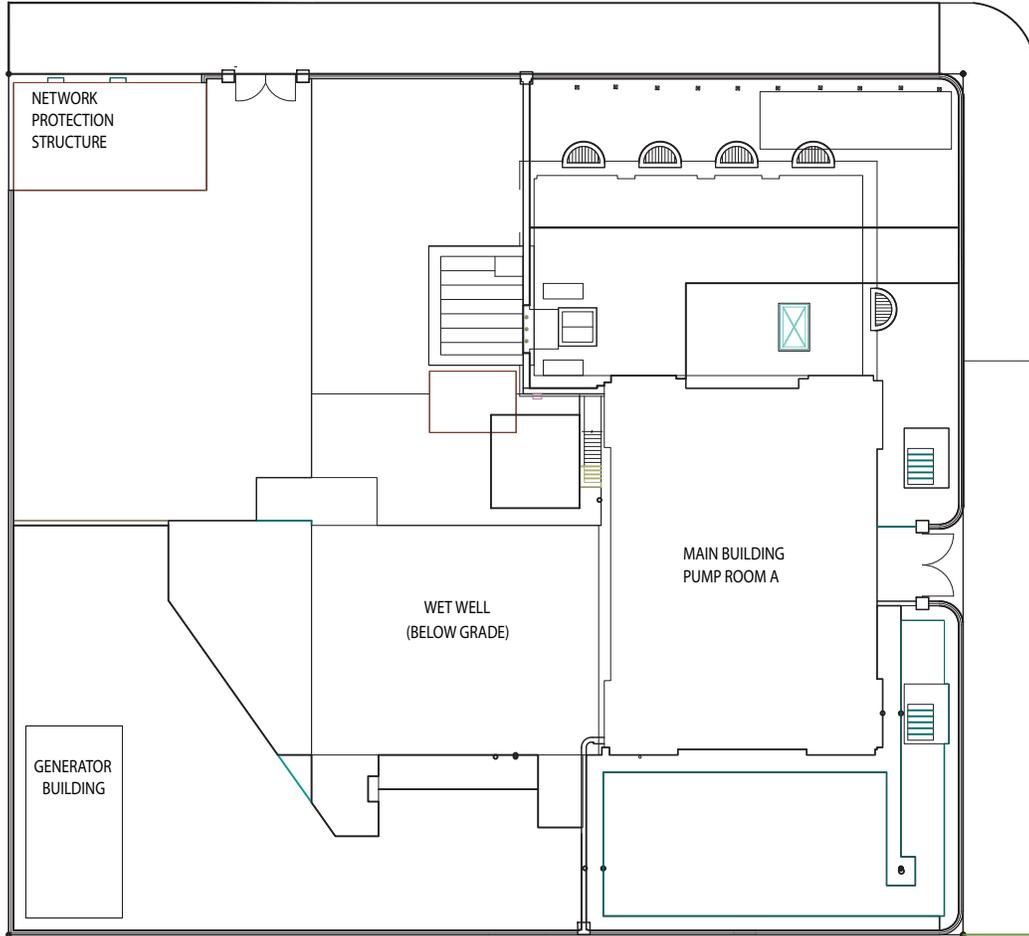
Non-Residential Uses

- 8 Commercial & Retail
- 8-0 Office
- 9 Light Industry
- 9-W Warehouse & Storage Yard
- 10 Automobile Storage & Service
- 11 Heavy Industry
- 12 Public & Private Institutions
- 13 Transportation
- 7-10 Predominant Use Is Followed by Subordinate Uses

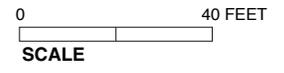
6.22.05

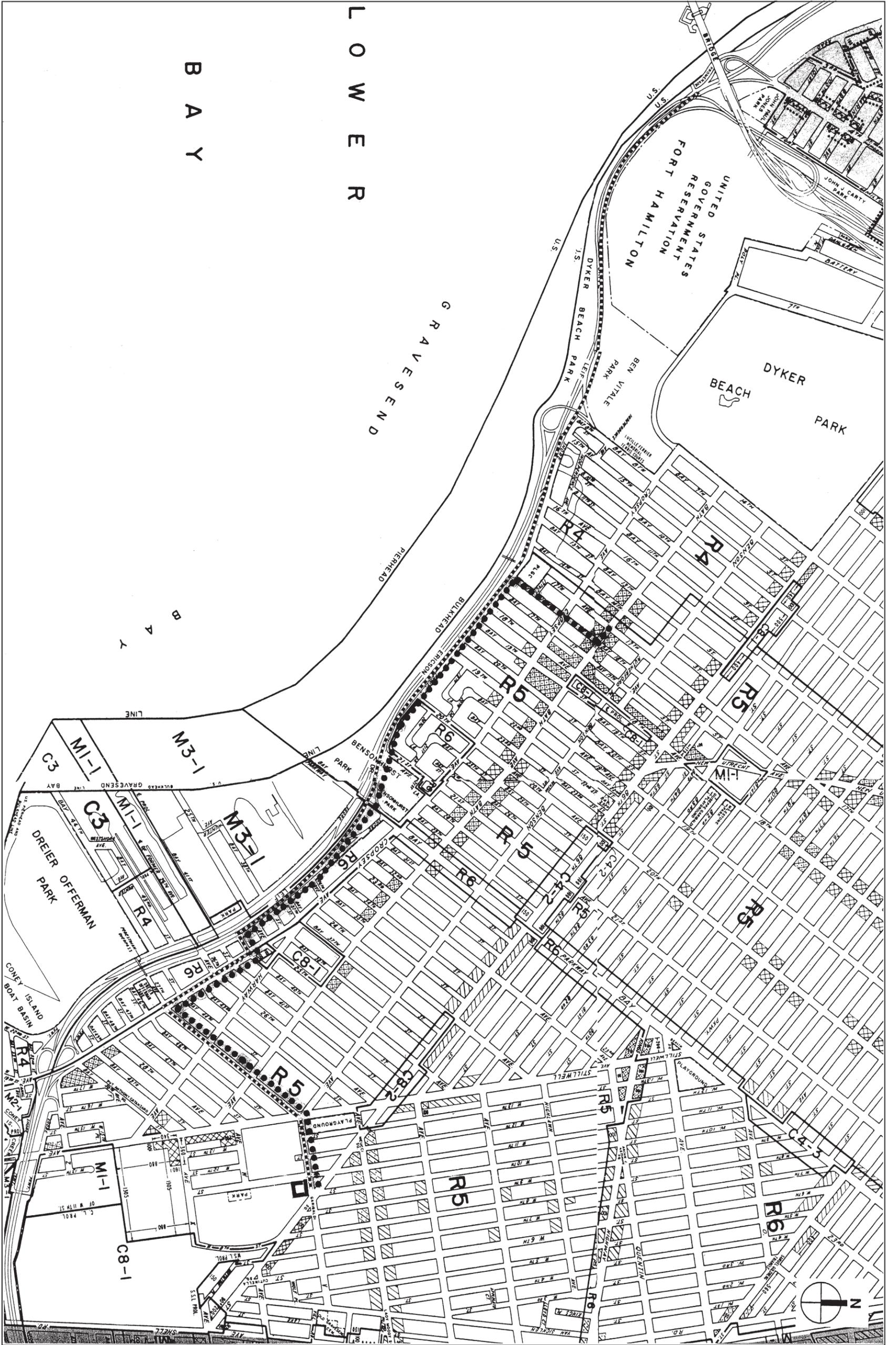


WEST 11th STREET



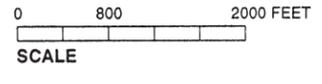
AVENUE V



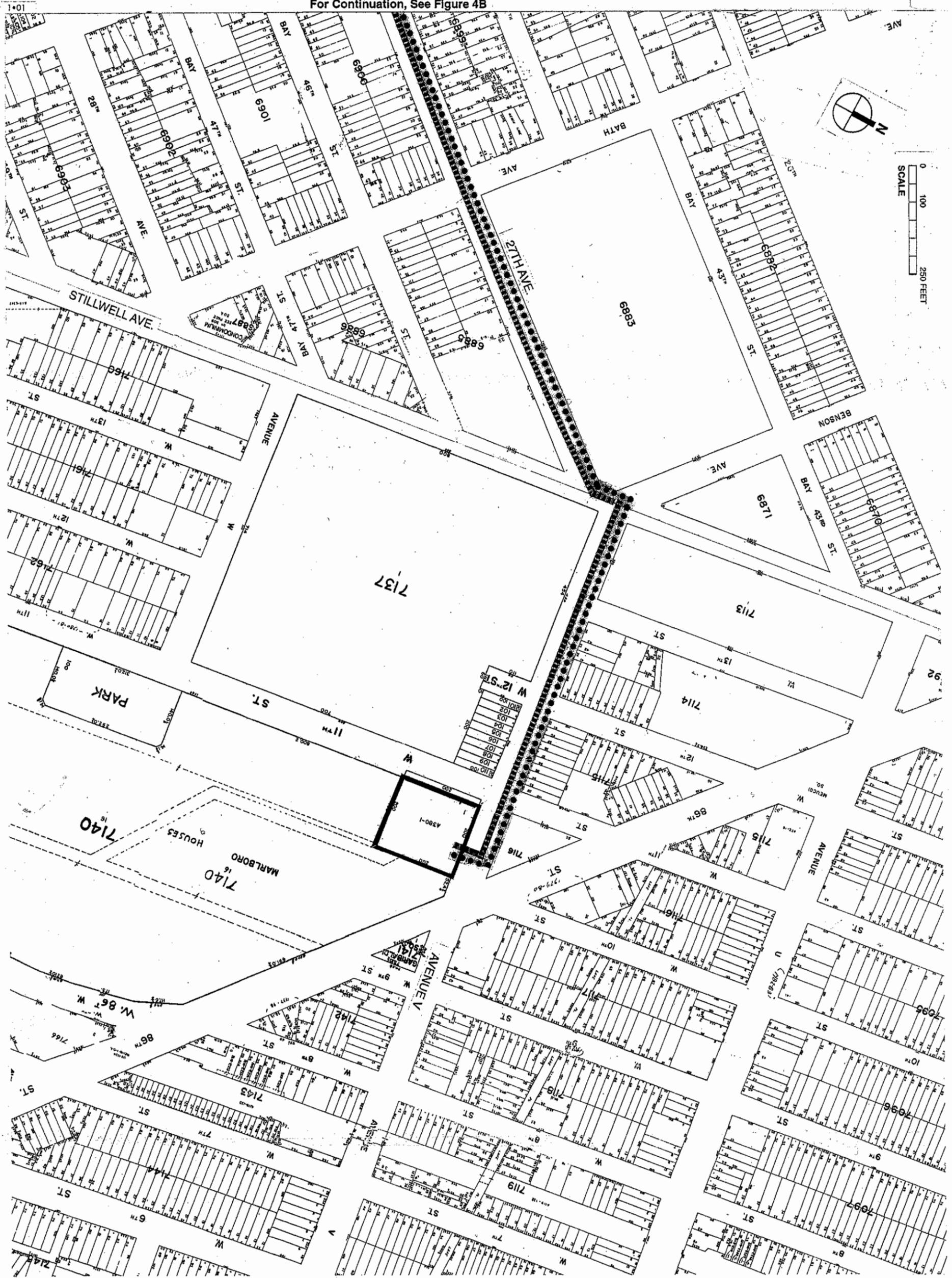


- Avenue V Pumping Station
- Proposed Dry Weather Flow Force Main
- Proposed Wet Weather Flow Force Main
- Zoning District Boundary

- C1-1 Overlay
- C1-2 Overlay
- C1-3 Overlay
- Special Purpose District
- C2-1 Overlay
- C2-2 Overlay
- C2-3 Overlay



For Continuation, See Figure 4B

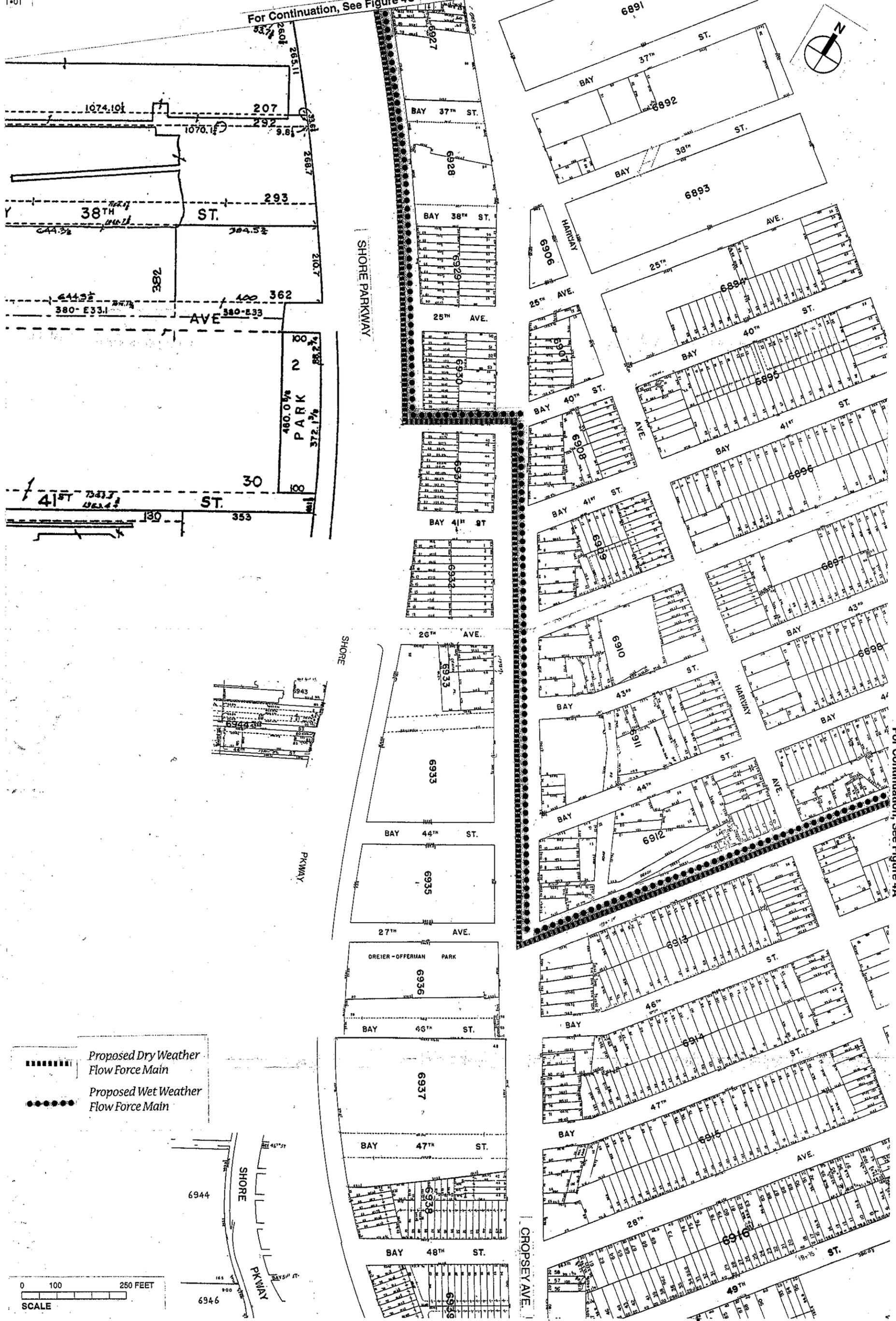


-  Avenue V Pumping Station
-  Proposed Dry Weather Flow Force Main
-  Proposed Wet Weather Flow Force Main

**AVENUE V
PUMPING
STATION**

**Tax Map
Figure 4A**

For Continuation, See Figure 4C



For Continuation, See Figure 4A

 Proposed Dry Weather Flow Force Main
 Proposed Wet Weather Flow Force Main

0 100 250 FEET
SCALE

**AVENUE V
PUMPING
STATION**

**Tax Map
Figure 4B**

For Continuation, See Figure 4D



Gravesend Bay

PARKWAY
SHORE

BENSONHURST
6490

ROAD EXTENSION
SHORE

PARK

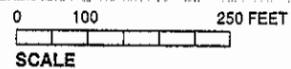
BAY PARKWAY

CROPSY AVE.

SHORE PARKWAY

For Continuation, See Figure 4B

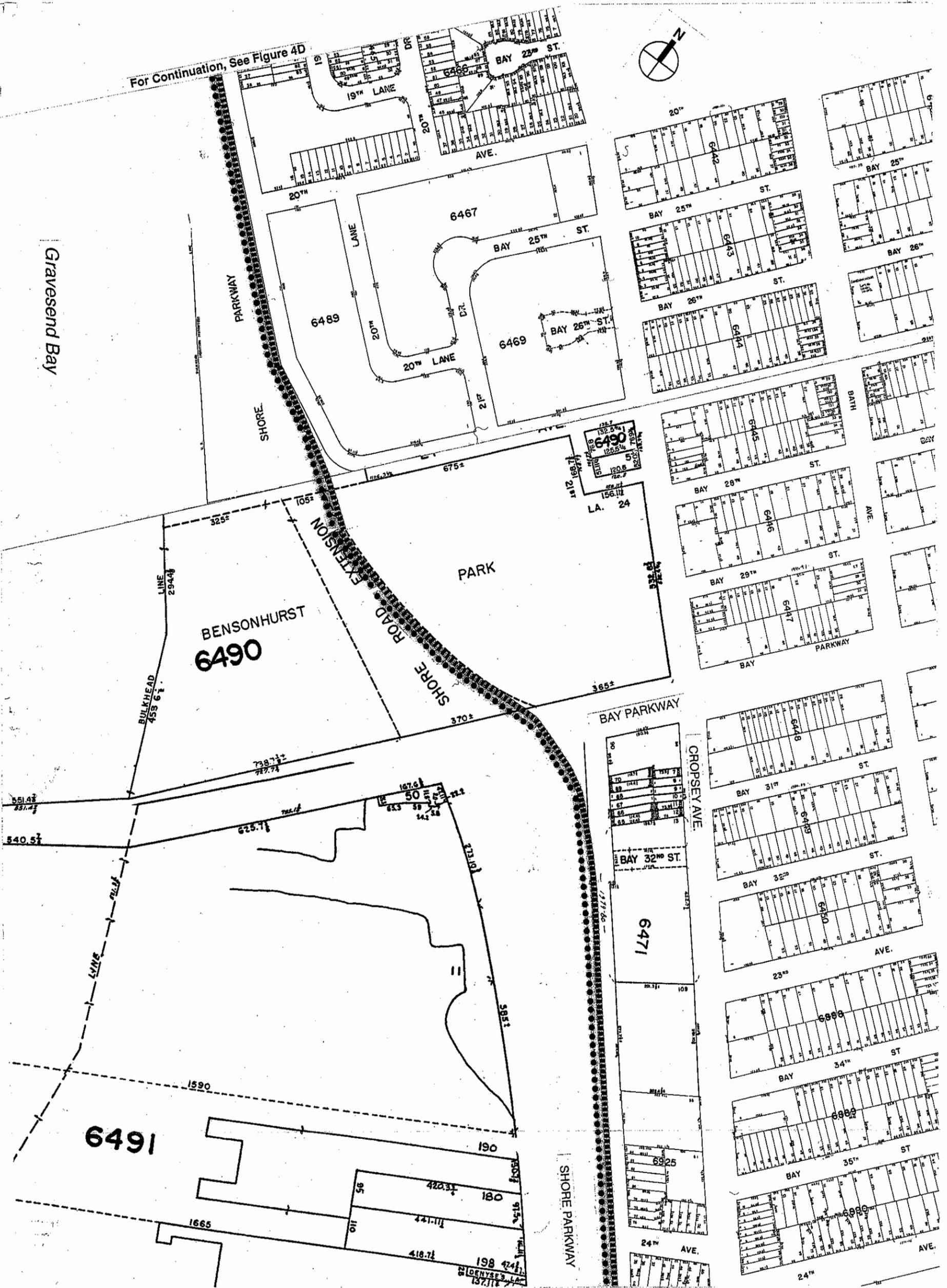
- Proposed Dry Weather Flow Force Main
- Proposed Wet Weather Flow Force Main



SCALE

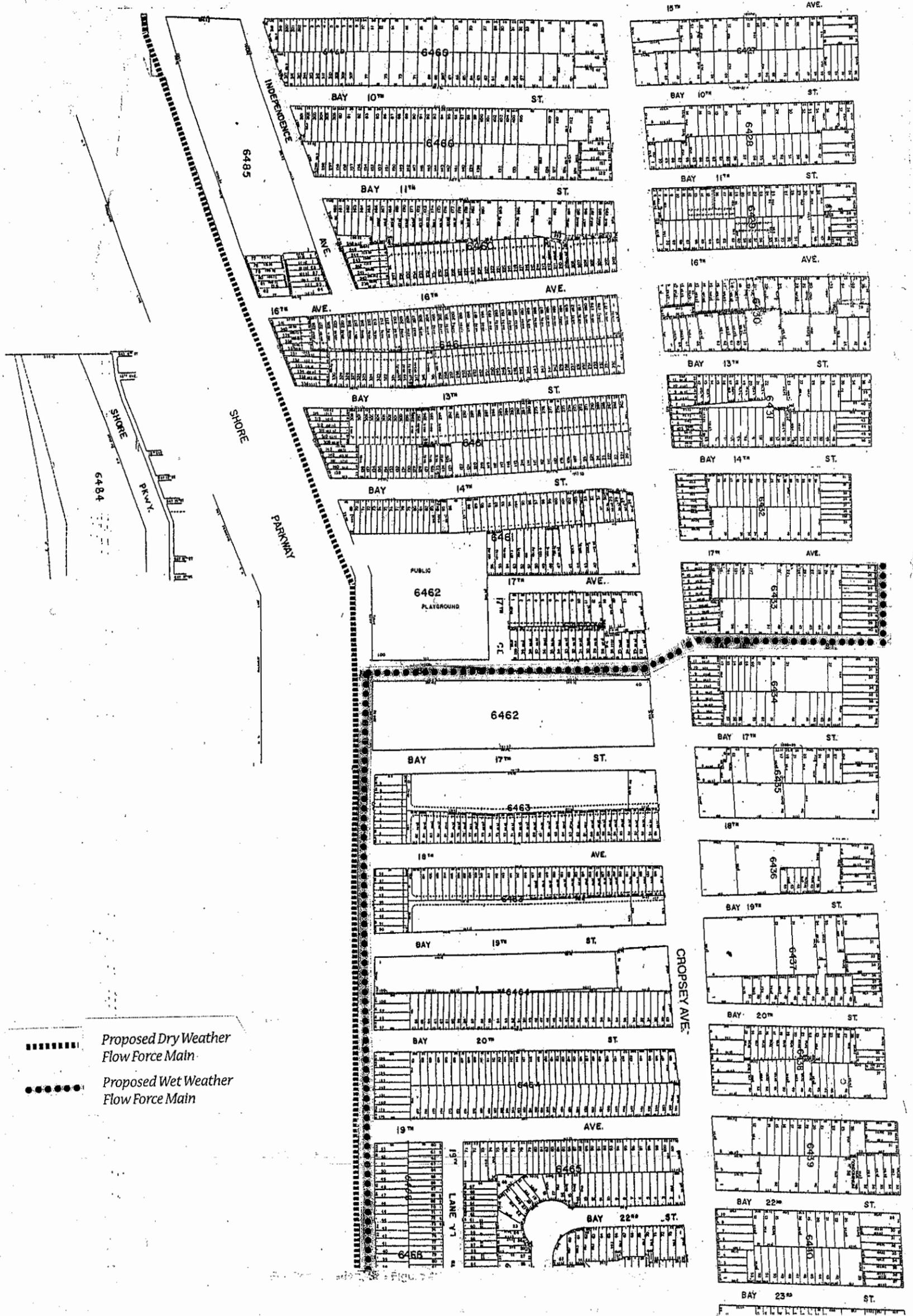
AVENUE V
PUMPING
STATION

Tax Map
Figure 4C





Gravesend Bay

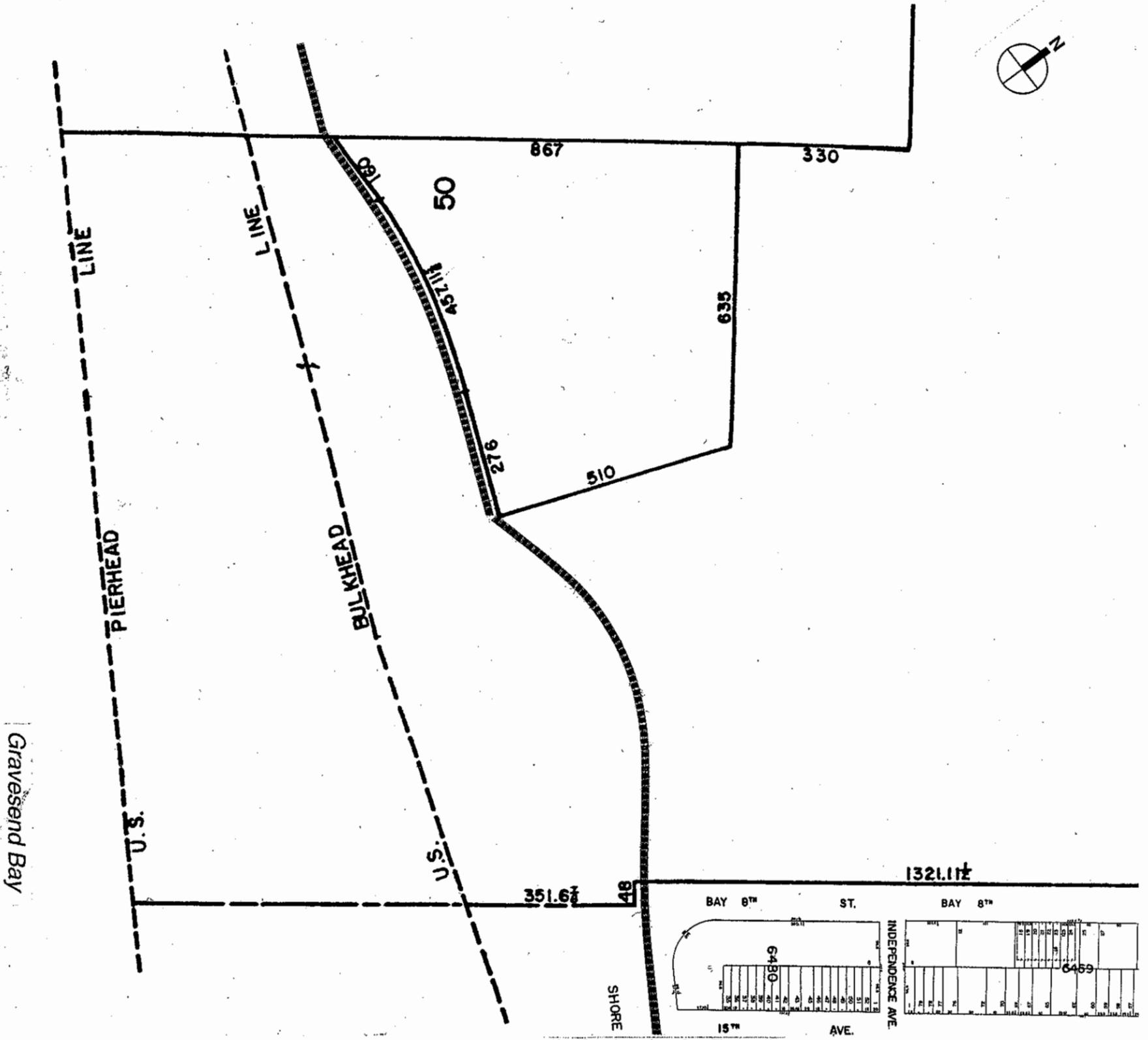


 Proposed Dry Weather Flow Force Main
 Proposed Wet Weather Flow Force Main

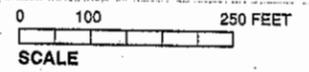
For Continuation, See Figure 4C



Note: Tax Map Information for this Area is Unavailable



For Continuation, See Figure 4D



4. EXISTING PARKING

Garages

No. of public spaces: N/A No. of accessory spaces: N/A
 Operating hours: _____ Attended or non-attended? _____

Lots

No. of public spaces: N/A No. of accessory spaces: N/A
 Operating hours: _____ Attended or non-attended? _____

Other (including street parking) please specify and provide same data as for lots and garages, as appropriate.

DEP employees and operational vehicles park behind the Crew Quarters. Typically, four or five vehicles are parked during the day and one or two are parked at night.

5. EXISTING STORAGE TANKS

Gas or service station? Yes No Oil storage facility? Yes No Other? Yes No

If yes, specify: There is a diesel fuel station on the southwest corner of the site.

Number and size of tanks: One 550-gallon diesel underground storage tank (UST) and two 1,200-gallon fuel oil (1, 2, or 4) above-ground storage tanks (AST). Two 55-gallon gasoline USTs in the southwest corner of the site were permanently sealed by purging and filling with concrete on July 11, 1996. Last NYFD inspection date: August 1995

Location and depth of tanks: The diesel UST is located on the southwest corner of the site at the diesel fuel station. The fuel oil ASTs are located in the Crew's Quarters in the substructure of the Switchboard Room.

6. CURRENT USERS

No. of residents: N/A No. and type of businesses: N/A

No. and type of workers by business: The pumping station currently has 12 employees: 5 engineers, 2 sewage treatment workers, and 5 security personnel. No. and type of non-residents who are not workers: N/A

SEE CEQR TECHNICAL MANUAL, CHAPTER III F., HISTORIC RESOURCES

7. HISTORIC RESOURCES (ARCHITECTURAL AND ARCHAEOLOGICAL RESOURCES)

Answer the following two questions with regard to the directly affected areas, lots abutting that area, lots along the same blockfront or directly across the street from the same blockfront, and, where the directly affected area includes a corner lot, lots which front on the same street intersection.

Do any of the areas listed above contain any improvement, interior landscape feature, aggregate of landscape of landscape features, or archaeological resource that:

- (a) has been designated (or is calendared for consideration as) a New York City Landmark, Interior Landmark or Scenic Landmark;
- (b) is within a designated New York City Historic District;
- (c) has been listed on, or determined eligible for, the New York State or National Register of Historic Places;
- (d) is within a New York State or National Register Historic District; or
- (e) has been recommended by the New York State Board for listing on the New York State or National Register of Historic Places?

Identify any resource:

Yes. See page 26g.

Do any of the areas listed in the introductory paragraph above contain any historic or archaeological resource, other than those listed in response to the previous question? Identify any resource.

Yes. See page 26g.

SEE CEQR TECHNICAL MANUAL, CHAPTER III K., WATERFRONT REVITALIZATION PROGRAM

8. WATERFRONT REVITALIZATION PROGRAM

Is any part of the directly affected area within the City's Waterfront Revitalization Program boundaries? Yes No

(A map of the boundaries can be obtained at the Department of City Planning bookstore.)

If yes, append a map showing the directly affected area as it relates to such boundaries. A map requested in other parts of this form may be used.

See Figure 5.

Project Description

THIS SUBPART SHOULD GENERALLY BE COMPLETED ONLY IF YOUR ACTION INCLUDES A SPECIFIC OR KNOWN DEVELOPMENT AT PARTICULAR LOCATIONS

9. CONSTRUCTION

Will the action result in demolition of or significant physical alteration to any improvement? Yes No

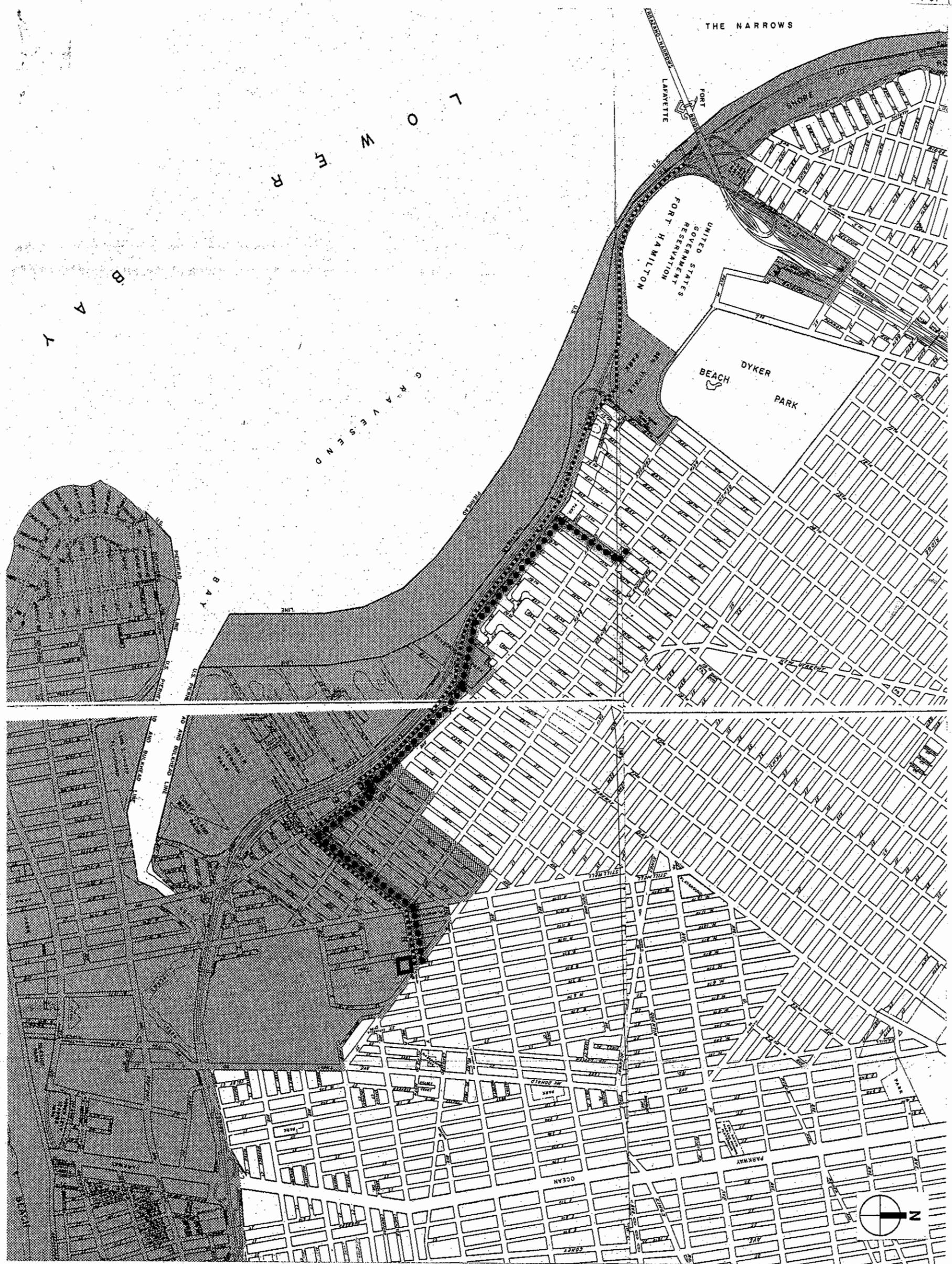
If yes, describe briefly:

The proposed action would result in the demolition of 4 buildings and the rehabilitation of the Main Building on the Avenue V Pumping Station site. In addition, installing the force mains would involve excavating and subsequently re-grading a trench along the length of the force main routes.

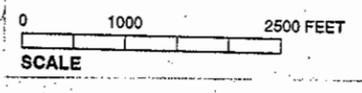
Will the action involve either above-ground construction resulting in any ground disturbance or in-ground construction? Yes No

If yes, describe briefly:

Lowering the Pumping Station's wet well's bottom elevation and installing the force mains would result in in-ground disturbance. Other activities that would cause in-ground disturbance include demolition of the storage building, construction of the generator building, and installation of a temporary pumping system.



-  Avenue V Pumping Station
-  Proposed Dry Weather Flow Force Main
-  Proposed Wet Weather Flow Force Main
-  Coastal Zone Area



**AVENUE V
PUMPING
STATION**

Coastal Zone Boundary
Figure 5

10. PROPOSED LAND USE

Residential

Total no. of dwelling units N/A No. of low-to-moderate income units _____ Gross floor area (sq. ft.) _____
 No. of stories _____
 Describe type of residential structures: _____

Commercial

Retail: No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 Office: No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 Other: No. of bldgs. N/A Gross floor area of each building (sq. ft.): _____
 No. of stories and height of each building: _____

Manufacturing/Industrial

No. of bldgs. N/A Gross floor area of each building (sq. ft.) _____
 No. of stories and height of each building: _____
 Type of use(s): _____ Open storage area (sq. ft.): N/A
 If any unenclosed activities, specify: _____

Community facility

Type of community facility: _____ N/A
 No. of bldgs. _____ Gross floor area of each building (sq. ft.): _____
 No. of stories and height of each building: _____

Vacant land

Is there any vacant land in the directly affected area? Yes No
 If yes, describe briefly: _____

Publicly accessible open space

Is there any publicly accessible open space to be removed or attached? Yes No
 If yes, describe briefly: _____

Any publicly accessible open space to be added? Yes No

If yes, describe briefly: _____

Other Land Use

No. of stories (Main Building): 1 story Gross floor area (sq. ft.): _____
Pumping station 5 buildings: approx. ±13,840 square feet
Dry weather force main: ±18,310 linear feet
Wet weather force main: ±13,100 linear feet
 Type of use(s): _____
Utility: pumping station and force main.

11. PROPOSED PARKING

Garages

No. of public spaces: N/A No. of accessory spaces: _____
 Operating hours: _____ Attended or non-attended? _____

Lots

No. of public spaces: N/A No. of accessory spaces: _____
 Operating hours: _____ Attended or non-attended? _____

Other (including street parking) – please specify and provide same data as for lots and garages, as appropriate.

Space would be provided for parking of DEP maintenance vehicles.

12. PROPOSED STORAGE TANKS

Gas or storage stations? Yes No Oil storage facility? Yes No
Other? Yes No

If yes, specify: **One 2,000-gallon diesel fuel AST within a containment dike in the southwest corner of the pumping station site.**

Number and size of tanks: _____ Location and depth of tanks: _____

13. PROPOSED USERS

No. of residents: N/A No. and type of businesses? N/A
No. and type of workers by businesses: See below. No. and type of non-residents who are not workers: N/A

The reconstructed pumping station would be an automatically controlled and remotely monitored unstaffed facility. No workers would be permanently on-site. However, maintenance crews would periodically service the pumping station.

14. HISTORIC RESOURCES (ARCHITECTURAL AND ARCHAEOLOGICAL RESOURCES)

Will the action affect any architectural or archaeological resource identified in response to either of the two questions at number 7 in the Site Description section of the form? Yes No

If yes, describe briefly:
A full analysis is given starting on Page 26f.

SEE CEQR TECHNICAL MANUAL CHAPTER III B., SOCIOECONOMIC CONDITIONS

15. DIRECT DISPLACEMENT

Will the action directly displace specific businesses or affordable and/or low income residential units? Yes No
If yes, describe briefly.

SEE CEQR TECHNICAL MANUAL CHAPTER III C., COMMUNITY FACILITIES & SERVICES

16. COMMUNITY FACILITIES

Will the action directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, hospitals, and other health care facilities, day care centers, police stations, or fire stations? Yes No
If yes, describe briefly.

Zoning Information

17. What is the zoning classification(s) of the directly affected area?

**Avenue V Pumping Station: R-5
Proposed Main Force Routes: R-5, R-6, and R-4**

18. What is the maximum amount of floor area that can be developed in the directly affected area under the present zoning? Describe in terms of bulk for each use.

N/A

19. What is the proposed zoning of the directly affected area?

No change in the zoning is proposed.

20. What is the maximum amount of floor area that could be developed in the directly affected area under the proposed zoning? Describe in terms of bulk for each use.

N/A

21. What are the predominant land uses and zoning classifications within a ¼-mile radius of the proposed action?

**The predominant land uses within a ¼-mile of the Pumping Station and force main routes are multi-family residential, open space and outdoor recreation.
The predominant zoning classifications within a ¼-mile of the Pumping Station and force main routes are R-5 and R-6.**

Additional Information

22. Attach any additional information as may be needed to describe the action. If your action involves changes in regulatory controls that affect one or more sites not associated with a specific development, it is generally appropriate to include here one or more reasonable development scenarios for such sites and, to the extent possible, to provide information about such scenario(s) similar to that requested in the Project Description questions 9 through 16.

Analyses

23. Attach analyses for each of the impact categories listed below (or indicate where an impact category is not applicable):

a.	LAND USE, ZONING, AND PUBLIC POLICY	See CEQR Technical Manual Chapter III.A.
b.	SOCIOECONOMIC CONDITIONS	See CEQR Technical Manual Chapter III.B.
c.	COMMUNITY FACILITIES AND SERVICES	See CEQR Technical Manual Chapter III.C.
d.	OPEN SPACE	See CEQR Technical Manual Chapter III.D.
e.	SHADOWS	See CEQR Technical Manual Chapter III.E.
f.	HISTORIC RESOURCES	See CEQR Technical Manual Chapter III.F.
g.	URBAN DESIGN/VISUAL RESOURCES	See CEQR Technical Manual Chapter III.G.
h.	NEIGHBORHOOD CHARACTER	See CEQR Technical Manual Chapter III.H.
i.	NATURAL RESOURCES	See CEQR Technical Manual Chapter III.I.
j.	HAZARDOUS MATERIALS	See CEQR Technical Manual Chapter III.J.
k.	WATERFRONT REVITALIZATION PROGRAM	See CEQR Technical Manual Chapter III.K.
l.	INFRASTRUCTURE AND ENERGY IMPACTS	See CEQR Technical Manual Chapter III.L.
m.	SOLID WASTE AND SANITATION SERVICES	See CEQR Technical Manual Chapter III.M.
n.	ENERGY	See CEQR Technical Manual Chapter III.N.
o.	TRAFFIC AND PARKING	See CEQR Technical Manual Chapter III.O.
p.	TRANSIT AND PEDESTRIANS	See CEQR Technical Manual Chapter III.P.
q.	AIR QUALITY	See CEQR Technical Manual Chapter III.Q.
r.	NOISE	See CEQR Technical Manual Chapter III.R.
s.	CONSTRUCTION IMPACTS	See CEQR Technical Manual Chapter III.S.
t.	PUBLIC HEALTH	See CEQR Technical Manual Chapter III.T.

The CEQR Technical Manual sets forth methodologies developed by the City to be used in analyses prepared for the above-listed categories. Other methodologies developed or approved by the lead agency may also be utilized. If a different methodology is contemplated, it may be advisable to consult with the Mayor's Office of Environmental Coordination. You should also attach any other necessary analyses or information relevant to the determination whether the action may have a significant impact on the environment, including, where appropriate, information on combined or cumulative impacts, as might occur, for example, where actions are independent or occur within a discrete geographical area or time frame.

For Internal Use Only:

WRP no. _____

Date Received: _____

DOS no. _____

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's designated coastal zone, must be reviewed and assessed for their consistency with the New York City Waterfront Revitalization Program (WRP). The WRP was adopted as a 197-a Plan by the Council of the City of New York on October 13, 1999, and subsequently approved by the New York State Department of State with the concurrence of the United States Department of Commerce pursuant to applicable state and federal law, including the Waterfront Revitalization of Coastal Areas and Inland Waterways Act. As a result of these approvals, state and federal discretionary actions within the city's coastal zone must be consistent to the maximum extent practicable with the WRP policies and the city must be given the opportunity to comment on all state and federal projects within its coastal zone.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, other state agencies or the New York City Department of City Planning in their review of the applicant's certification of consistency.

A. APPLICANT

1. Name: New York City Department of Environmental Protection
2. Address: 59-17 Junction Blvd. Flushing, New York 11373-5108
3. Telephone: 718 595-4398 Fax: 718 595-4479 E-mail: alicata@dep.nyc.gov
4. Project site owner: New York City Department of Environmental Protection

B. PROPOSED ACTIVITY

1. Brief description of activity:

Upgrading of the Avenue V Pumping Station and installation of two parallel force mains to the Owls Head Water Pollution Control Plant and to Regulator 9A at the Verazano Narrows.
2. Purpose of activity:

Improvement of water quality in Coney Island Creek and Gravesend Bay
3. Location of activity: (street address/borough or site description):

Avenue V Pumping Station is located at the intersection of Avenue V and West 11th Street in Brooklyn. The force mains would run to Lief Ericson Drive/Shore Parkway and would be buried in the shoulder of the roadway.

Proposed Activity Cont'd

4. If a federal or state permit or license was issued or is required for the proposed activity, identify the permit type(s), the authorizing agency and provide the application or permit number(s), if known:
The existing State Pollutant Discharge Elimination System (SPDES) permit would have to be modified.

5. Is federal or state funding being used to finance the project? If so, please identify the funding source(s).
No

6. Will the proposed project require the preparation of an environmental impact statement?
Yes _____ No If yes, identify Lead Agency:

7. Identify city discretionary actions, such as a zoning amendment or adoption of an urban renewal plan, required for the proposed project.
None

C. COASTAL ASSESSMENT

Location Questions:	Yes	No
1. Is the project site on the waterfront or at the water's edge?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Does the proposed project require a waterfront site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land underwater, or coastal waters?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Policy Questions	Yes	No

The following questions represent, in a broad sense, the policies of the WRP. Numbers in parentheses after each question indicate the policy or policies addressed by the question. The new Waterfront Revitalization Program offers detailed explanations of the policies, including criteria for consistency determinations.

Check either "Yes" or "No" for each of the following questions. For all "yes" responses, provide an attachment assessing the effects of the proposed activity on the relevant policies or standards. Explain how the action would be consistent with the goals of those policies and standards.

4. Will the proposed project result in revitalization or redevelopment of a deteriorated or under-used waterfront site? (1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is the project site appropriate for residential or commercial redevelopment? (1.1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Will the action result in a change in scale or character of a neighborhood? (1.2)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Policy Questions cont'd

Yes No

- | | Yes | No |
|---|-----|----|
| 7. Will the proposed activity require provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (1.3) | | ✓ |
| 8. Is the action located in one of the designated Significant Maritime and Industrial Areas (SMIA): South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park, or Staten Island? (2) | | ✓ |
| 9. Are there any waterfront structures, such as piers, docks, bulkheads or wharves, located on the project sites? (2) | | ✓ |
| 10. Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (2.1) | | ✓ |
| 11. Does the action involve the siting of a working waterfront use outside of a SMIA? (2.2) | | ✓ |
| 12. Does the proposed project involve infrastructure improvement, such as construction or repair of piers, docks, or bulkheads? (2.3, 3.2) | | ✓ |
| 13. Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (2.3, 3.1, 4, 5.3, 6.3) | | ✓ |
| 14. Would the action be located in a commercial or recreational boating center, such as City Island, Sheepshead Bay or Great Kills or an area devoted to water-dependent transportation? (3) | | ✓ |
| 15. Would the proposed project have an adverse effect upon the land or water uses within a commercial or recreation boating center or water-dependent transportation center? (3.1) | | ✓ |
| 16. Would the proposed project create any conflicts between commercial and recreational boating? (3.2) | | ✓ |
| 17. Does the proposed project involve any boating activity that would have an impact on the aquatic environment or surrounding land and water uses? (3.3) | | ✓ |
| 18. Is the action located in one of the designated Special Natural Waterfront Areas (SNWA): Long Island Sound- East River, Jamaica Bay, or Northwest Staten Island? (4 and 9.2) | | ✓ |
| 19. Is the project site in or adjacent to a Significant Coastal Fish and Wildlife Habitat? (4.1) | | ✓ |
| 20. Is the site located within or adjacent to a Recognized Ecological Complex: South Shore of Staten Island or Riverdale Natural Area District? (4.1and 9.2) | | ✓ |
| 21. Would the action involve any activity in or near a tidal or freshwater wetland? (4.2) | | ✓ |
| 22. Does the project site contain a rare ecological community or would the proposed project affect a vulnerable plant, fish, or wildlife species? (4.3) | | ✓ |
| 23. Would the action have any effects on commercial or recreational use of fish resources? (4.4) | | ✓ |
| 24. Would the proposed project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (5) | ✓ | |
| 25. Would the action result in any direct or indirect discharges, including toxins, hazardous substances, or other pollutants, effluent, or waste, into any waterbody? (5.1) | ✓ | |
| 26. Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters? (5.1) | ✓ | |
| 27. Will any activity associated with the project generate nonpoint source pollution? (5.2) | | ✓ |
| 28. Would the action cause violations of the National or State air quality standards? (5.2) | | ✓ |

Policy Questions cont'd

Yes No

29. Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (5.2C)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30. Will the project involve the excavation or placing of fill in or near navigable waters, marshes, estuaries, tidal marshes or other wetlands? (5.3)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31. Would the proposed action have any effects on surface or ground water supplies? (5.4)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32. Would the action result in any activities within a federally designated flood hazard area or state-designated erosion hazards area? (6)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Would the action result in any construction activities that would lead to erosion? (6)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Would the action involve construction or reconstruction of a flood or erosion control structure? (6.1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (6.1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36. Does the proposed project involve use of public funds for flood prevention or erosion control? (6.2)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37. Would the proposed project affect a non-renewable source of sand ? (6.3)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38. Would the action result in shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants? (7)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39. Would the action affect any sites that have been used as landfills? (7.1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40. Would the action result in development of a site that may contain contamination or that has a history of underground fuel tanks, oil spills, or other form or petroleum product use or storage? (7.2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
41. Will the proposed activity result in any transport, storage, treatment, or disposal of solid wastes or hazardous materials, or the siting of a solid or hazardous waste facility? (7.3)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42. Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, or public parks or open spaces? (8)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43. Will the proposed project affect or be located in, on, or adjacent to any federal, state, or city park or other land in public ownership protected for open space preservation? (8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
44. Would the action result in the provision of open space without provision for its maintenance? (8.1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreational space? (8.2)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
46. Will the proposed project impede visual access to coastal lands, waters and open space? (8.3)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47. Does the proposed project involve publicly owned or acquired land that could accommodate waterfront open space or recreation? (8.4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
48. Does the project site involve lands or waters held in public trust by the state or city? (8.5)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
49. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (9)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
50. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (9.1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Policy Questions cont'd

Yes No

51. Would the proposed action have a significant adverse impact on historic, archeological, or cultural resources? (10)

52. Will the proposed activity affect or be located in, on, or adjacent to an historic resource listed on the National or State Register of Historic Places, or designated as a landmark by the City of New York? (10)

D. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's Waterfront Revitalization Program, pursuant to the New York State Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If the certification can be made, complete this section.

"The proposed activity complies with New York State's Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent Name: Angela Licata, Assistant Commissioner, NYC DEP

Address: 59-17 Junction Blvd. Flushing, New York 11373-5108

Telephone 718 595-4398

Applicant/Agent Signature: _____

Date: _____

A. INTRODUCTION

The Environmental Assessment Statement (EAS) form requests analyses for a number of impact categories. This supplemental report addresses each of the areas for the Avenue V Pumping Station and Force Mains project, following the methodologies set forth in the *City Environmental Quality Review (CEQR) Technical Manual*.

B. PROJECT DESCRIPTION

INTRODUCTION

The New York City Department of Environmental Protection (NYCDEP) proposes to upgrade and rehabilitate the Avenue V Pumping Station to meet combined sewer overflow (CSO) abatement requirements and pumping station capacity and flow conveyance requirements established by the New York State Department of Environmental Conservation (NYSDEC) and to comply with the U.S. Environmental Protection Agency's (EPA) Final CSO Policy.

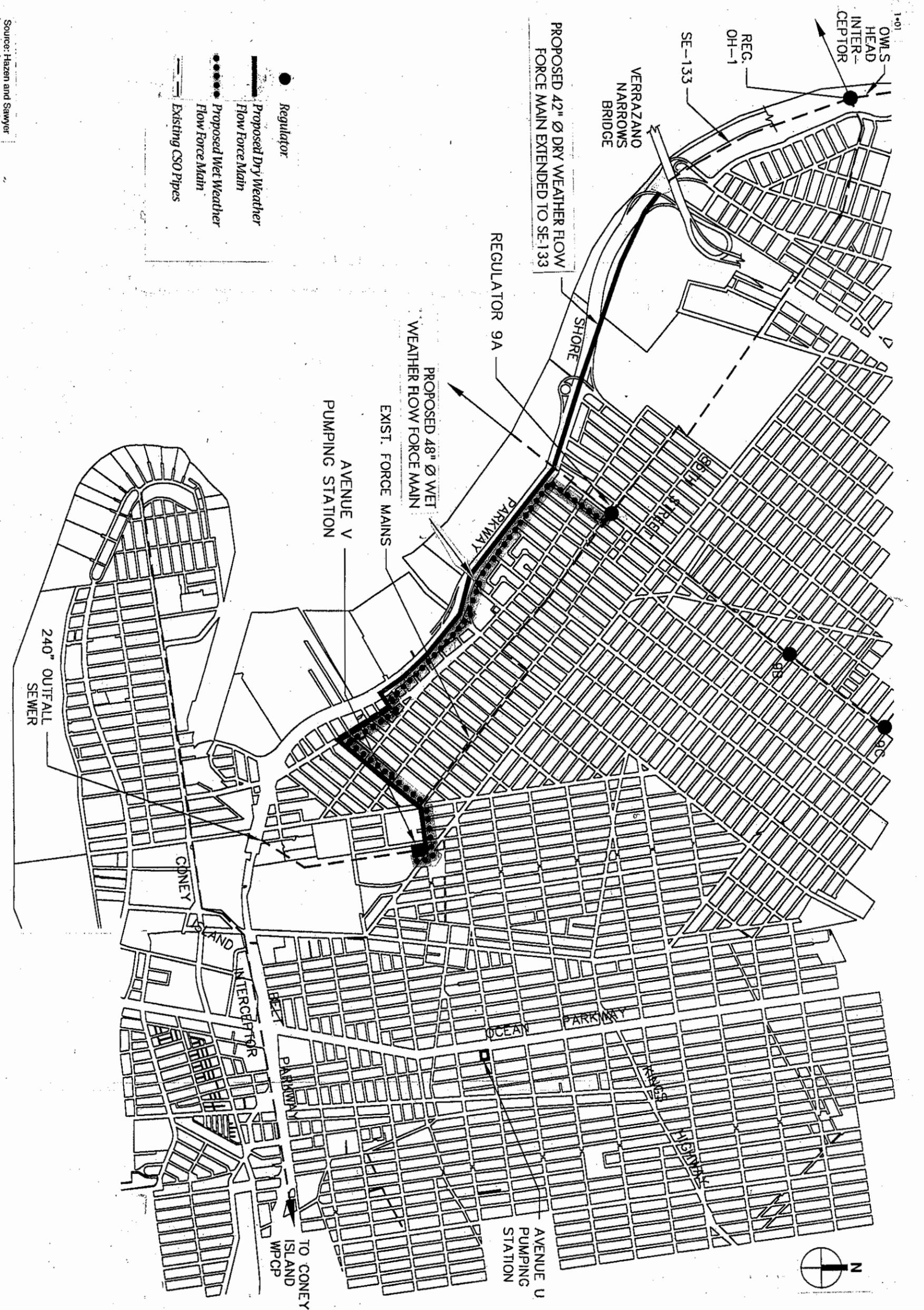
NYCDEP would increase wet weather flow capacity at the pumping station from approximately 30 million gallons per day (mgd) to 80 mgd. The Avenue V Pumping Station is located at 76 Avenue V at the corner of West 11th Street and Avenue V in the Bensonhurst section of Brooklyn, N.Y. (see Figure 6). The pumping station serves the southeastern portion of the Owls Head Water Pollution Control Plant (WPCP) service area, and has a service area of approximately 2,900 acres of primarily residential development with some commercial activity along the main thoroughfares (see Figure 7).

In addition, as part of the project, NYCDEP would construct two new force mains. The two existing force mains would be capped and closed in place. One force main would connect to an existing sewer line known as SE-133 Section 1, which is an existing, but unused box sewer. The unused sewer was constructed in the early 1970's as part of the planning of future sewage connections; the proposed project fulfills such long term planning. The existing, unused sewer would be relined for corrosion control, and the bulkhead which blocks it off would be removed. This new force main would be used during dry weather to convey sanitary sewage to the Owls Head WPCP. The other force main would connect to the existing Regulator 9A (at 17th and Bath Avenues). During rain events that result in flows greater than 35 mgd at the Avenue V Pumping Station, both force mains would be used to convey CSO flow. There would be no increase in dry or wet weather flows to the Owls Head WPCP from the proposed project. The locations and routes of the force mains are shown on Figure 6. NYCDEP fully expects to construct along these routes. However, if at some time in the future NYCDEP chooses an alternative route, an environmental review of the changed route would be performed.

PURPOSE AND NEED

In response to rising concerns about water quality in New York City's receiving waters, the Phase I City-Wide CSO Study was initiated to determine the impacts of CSOs on water quality, to establish the extent to which specific areas in New York City are affected by CSOs, and to lay the groundwork for the preparation of a Phase II work plan detailing the measures required for a City-wide CSO abatement program. The existing water quality issues at Coney Island Creek were analyzed in the Phase I study.

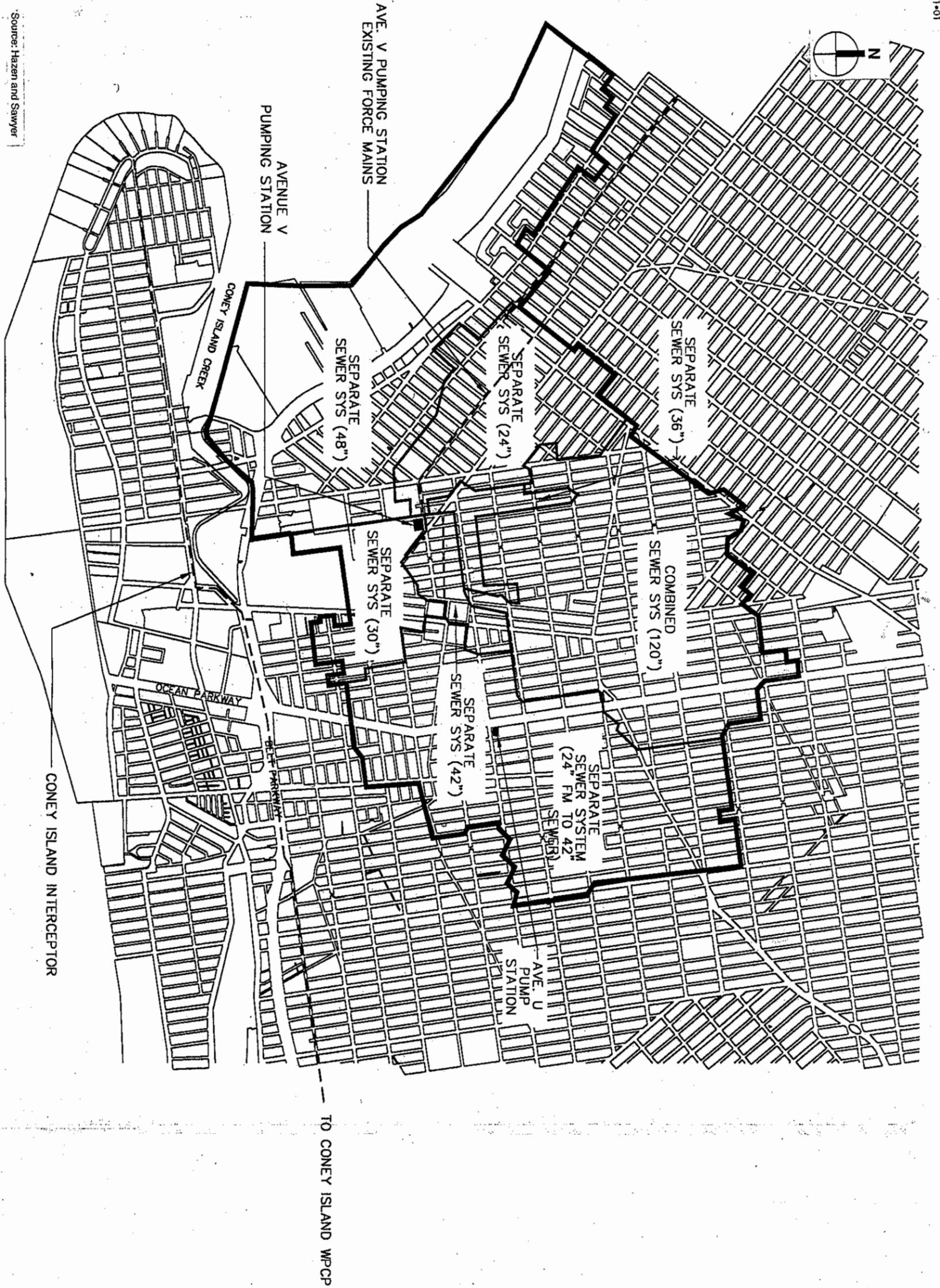
The Phase II City-Wide CSO Study delineated four primary facility planning areas: Outer Harbor, Inner Harbor, East River, and Jamaica Bay. Separate tributary facility planning projects



- Regulator
- Proposed Dry Weather Flow Force Main
- Proposed Wet Weather Flow Force Main
- Existing CSO Pipes

Source: Hazen and Sawyer

Pumping Station and Proposed Force Main Route
 Figure 6



Source: Hazen and Sawyer

- Avenue V Pumping Station
- Existing Major Sewer Pipes

were developed for areas of particular concern, including Coney Island Creek. These facility planning projects were designed to comply with NYSDEC State Pollutant Discharge Elimination System (SPDES) permit requirements and consent orders.

The Phase II study addressed water quality issues associated with CSO and discharges, including floatables, settleable solids, oil, and grease. Projects that have been implemented under the Phase II program focus on the removal or reduction of pollutant discharges into receiving waters, and include such design control measures as maximizing flows from pumping stations to WPCPs and other measures. As part of NYCDEP's Consent Order, the Phase II implementation comprises two tracks: Track I, DO and coliform bacteria (CSO-related); and Track II, settleables and floatables.

This proposed Phase II, Track I project would enhance water quality by conveying up to 80 mgd away from the constricted waters of Coney Island Creek to waters with strong tidal currents which can better accommodate CSO, thereby meeting CSO abatement requirements, complying with EPA's Final CSO Policy, and satisfying pumping station capacity and flow conveyance requirements.

EXISTING CONDITIONS

PUMPING STATION

The existing pumping station has five structures: the Main Building, the Wet Well, Pump Room B, the Switchboard Room, and the Storage Building. The Crew Quarters and Work Shop are located below grade in the substructure beneath the Switchboard Room and lawn in the northwest corner of the site (see Figure 8).

The peak dry weather flow at the Avenue V Pumping Station is estimated at 30 mgd. The Avenue V Pumping Station is manually operated, requiring 24-hour on-site operation and monitoring by station crews. The pumping station currently has 12 employees consisting of five engineers and two sewage treatment workers. Five security personnel are hired through a private contractor.

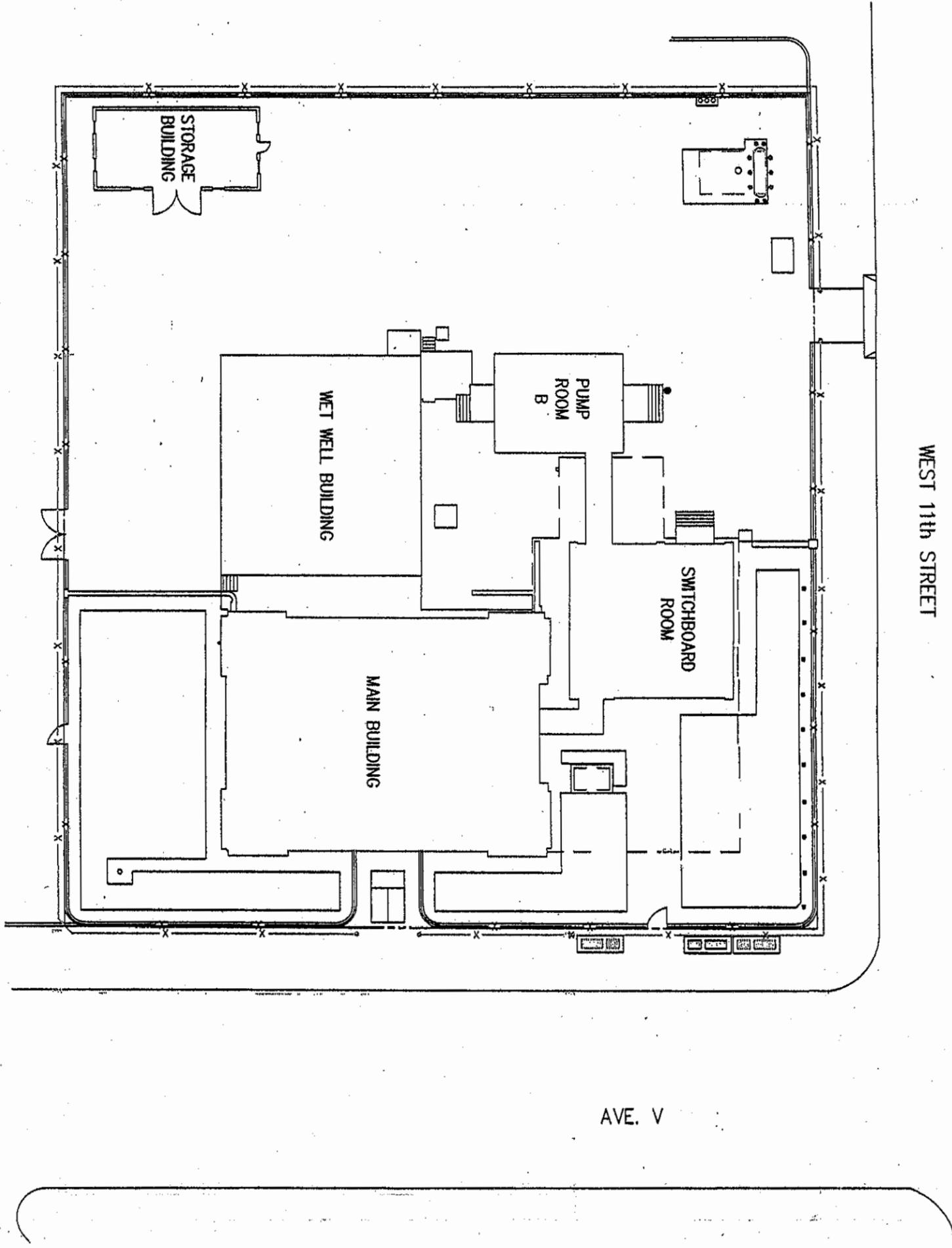
FORCE MAINS

Four sewage pumps discharge to a 30-inch cast-iron force main that is approximately 5,500 feet long. Two sewage pumps discharge to a 24-inch cast-iron force main approximately 5,650 feet long. The two existing force mains discharge to a 78-inch gravity sewer at 21st and Benson Avenues. The wastewater flow is then conveyed to the Owls Head WPCP via an interceptor sewer downstream of Regulators 9A and OH-1 (see Figure 6). This system is sized to convey sanitary sewage but becomes overloaded during storm events, when both sanitary sewage and storm water enter the combined sewer systems. When the capacity of the pumps and force mains is exceeded during wet weather, CSO is discharged into Coney Island Creek, which has low flows and poor dispersion characteristics. This discharge occurs on average every three days, but the frequency varies with precipitation conditions.

PROPOSED PLAN

PUMPING STATION

The proposed Avenue V Pumping Station rehabilitation and upgrade would involve equipping the station with six wet pit submersible pumps (see Figure 2). The proposed equipment and



Existing Avenue V Pumping Station
Figure 8

controls in the upgraded pumping station would accommodate up to 80 mgd. The peak wet weather capacity of the pumping station would satisfy the EPA's Final CSO Policy using the presumptive approach for 85 percent capture of the expected maximum flow, including dry weather flow. The portion of the wet weather flow that is not captured would overflow into Coney Island Creek. This overflow would only occur during the larger storms; average sized storms would be completely re-conveyed and would not discharge into Coney Island Creek. The upgraded pumping station would be designed for remote operation and would not require on-site staffing.

Under the proposed plan, the Main Building would house the Electrical Room containing upgraded electrical switch gear, variable frequency drives (adjusts operations to accommodate the wide variation of influent flows), and Motor Control Center (MCC) (e.g., power distributor) equipment. A new transformer would increase the station's capacity to handle incoming voltage from Con Edison. The Electrical Room would be constructed above the southern half of the Main Building, at the same elevation as the existing mezzanine walkway. An emergency generator and automatic transfer switch would be installed to provide emergency power and automatic switching in the event of power loss at the site. The Generator Building would be located in the southeast corner of the site in place of the existing Storage Building (see Figure 2).

Of the existing pumping station structures, the Main Building is the only structure that would be retained. The Wet Well superstructure, Pump Room B superstructure, Switchboard Room, and Storage Building would be demolished because they are not necessary in the operation of the upgraded station. The existing Crew Quarters and Work Shop (lockers, showers, laundry, kitchen, and parts storage) partially located in the Switchboard Room substructure would be converted to exclusive use for small parts storage. However, the bathroom in the ground-floor office would be retained and modernized.

During the rehabilitation, all existing pumps, mechanical, electrical, and HVAC (gas-fired steam boiler, unit heaters, etc.) equipment would be removed, and the new pumps and equipment would be installed over a staged rehabilitation process. Interim pumping would be provided by a general construction contractor at a design capacity of 30 mgd, comparable to the capacity of the existing pumping station. The interim pumping system would discharge into the existing force main using submersible pumps in the regulator chamber. The interim pumping system would be available for continuous 24 hours per day operation. After completion of the new Wet Well, the flows would be diverted into it. At that time, the facility's existing pumps could be removed and replaced. The entire station upgrade would take place over an estimated 54-month period.

Upgrading the Main Building would require extensive interior and exterior modifications. The building is a classical Beaux-Arts style brick building featuring elaborate decorative details in terra cotta, cast iron, and bronze, and a tiled roof. It has been found to be eligible for listing on the National Historic Register. The facade of the Main Building, however, is in poor condition. The glazed terra cotta has failed and is missing in many areas, and it is badly deteriorated and spalling in other areas. The facade would be repaired to as close to original as possible. The existing materials would be reused to the extent possible. For security purposes, metal window guards have been installed over the striking cast-iron window frames. These window guards would be removed, and the existing window glass would be replaced with insulated vandal-resistant polycarbonate glazing. The potential impacts of the rehabilitation of the Main Building are discussed under Section H, "Historic and Archaeological Resources."

FORCE MAINS

Two parallel force mains are proposed: a 42-inch diameter pipe to carry up to 35 mgd of dry weather sanitary sewage and a 48-inch diameter pipe to convey up to 45 mgd of combined wet weather sanitary and storm water sewage. The existing force mains would be capped and closed in-place. The proposed routes are shown on Figures 1A and 1B. The dry weather force main would be routed to convey discharge from the Avenue V Pumping Station to the existing SE-133 Section 1, a box sewer constructed in the early 1970's but never used (see Figure 6). SE-133 would have to be relined for corrosion control, and the bulkhead that blocks it off would have to be removed. The proposed route of the dry weather force main is approximately 18,500 feet and follows Avenue V to the intersection of Stillwell, Benson, and 27th Avenues. The proposed force main route would continue south along 27th Avenue, west along Cropsey Avenue, and south along Bay 40th Street, crossing the Shore Parkway Service Road. The proposed route would follow the northern grassy shoulder of the Shore Parkway in a westerly direction to Bay 20th Street. From there, the route would follow the alignment of a previously designed but not constructed gravity sewer past the entrance ramp to the Verrazano-Narrows Bridge and connect to the SE-133 Section 1 sewer. The wet weather force main would follow the same routing as the dry weather force main up to Bay 16th Street. At Bay 16th Street and the Shore Parkway, the proposed wet weather force main would turn northeast and run underground to Bath Avenue. At that point, the proposed wet weather force main would turn northwest under Bath Avenue and terminate at Regulator 9A under the intersection of Bath Avenue and 17th Avenue. The discharge route from Regulator 9A is under 17th Avenue (see Figure 6). During wet weather, the re-conveyed CSO flows would no longer discharge into the constricted waters of Coney Island Creek, but would be rerouted to the Verrazano Narrows and Gravesend Bay, which have stronger tidal currents and better circulation. However, CSOs in excess of 80 mgd would discharge to Coney Island Creek.

The portion of the proposed force main routes along Avenue V, 27th and Cropsey Avenues, and Bay 40th and Bay 16th Streets would be constructed below grade within the bed of existing city streets. Along the grassy shoulder of Shore Parkway, the force mains would be located below grade. The force main trench would be designed with a minimum 4-foot cover and an overall average depth of 9 feet. Manholes for maintenance would be located about every 300 linear feet.

Along the portion of the proposed force main routes along Avenue V, 27th and Cropsey Avenues, and Bay 40th and Bay 16th Streets and areas near sensitive buildings and utilities, the force mains would be installed by microtunneling. The depth would be about 10 to 25 feet below existing grade. Microtunneling involves digging 10-foot by 20-foot pits for one pipe and 20-foot by 20-foot pits for two pipes about every 750 feet and at bends in the pipeline route. A tunnel just large enough to fit the force main(s) would be bored and the pipes inserted. About 1,800 linear feet of single force main would be installed, and about 5,400 linear feet of dual force main would be installed via microtunneling. Microtunneling, while more expensive, minimizes disruptions to traffic, the community and exposed soils.

Along the shoulder of Shore Parkway, the force main(s) would be installed using cut and cover methods. A trench would be dug using surface equipment. Bedding materials would be installed, and the pipelines laid in the trench. The trench is backfilled with the excavated materials, if they are suitable for that use. For cut and cover, the work zone would be about 40 feet wide and the trench would be 15 feet wide. About 7,200 linear feet of single force main would be installed, and about 6,000 linear feet each of dual force mains would be installed.

The path of the dry weather force main would run near the U.S. Government's Fort Hamilton military base. NYCDEP has coordinated with the federal government to ensure that Fort Hamilton's security needs are met both during and after construction.

REQUIRED PERMITS AND APPROVALS

New York State approvals necessary for the proposed upgrade of the pumping station and force mains include a Long Island Well Permit for dewatering during construction, a Construction State Pollution Discharge Elimination System (SPDES), and air emission registrations. In addition, a coastal consistency finding is required from New York City Department of City Planning. These permits and approvals are shown on Table EAS I-9.

C. LAND USE, ZONING, AND PUBLIC POLICY

The predominant land use in the vicinity of the Avenue V Pumping Station is residential. The pumping station is adjacent to the Marlboro Houses, a publicly subsidized housing complex encompassing two superblocks. The area includes a range of different housing types, including one-family detached, one-family attached, two-family housing, and apartment buildings. Other land uses in the vicinity of the pumping station include commercial and retail, automotive uses, open space, and some vacant properties. Institutional uses in the vicinity include Lafayette High School at 27th and Benson Avenues, and the Mt. Oliviet Presbyterian Church at 86th and West 12th Streets.

Most of the area in the vicinity of the pumping station is zoned R5. Other zoning classifications include C8-1 and C8-2. The R5 designation, which is widely mapped in Brooklyn, is a medium-density housing district predominantly comprising apartment buildings and two- and three-family row houses. This zoning classification allows a variety of housing types and provides a transitional area between low- and higher-density areas. The C8 zoning district, considered a general service district, permits automotive and other heavy commercial services. Automotive sales and service are typical uses in C8-1 districts; automobile showrooms and offices are typical in C8-2 districts.

Shore Parkway (also known as Leif Ericson Drive) is mapped public parkland, and the zoning designations do not apply. The inland shoulder of the roadway is not accessible for public uses. The roadway blocks access from one side and a fence blocks access from the residential areas. Public use of the parkland is on the water side of Shore Parkway. Access is by automobile and by pedestrian overpasses.

Zoning alongside the proposed parallel force main routes, including Bay 16th Street and Bath Avenue, is exclusively residential, mostly R4, R5, and R6 zoning classifications. The R4 district permits a variety of housing types, including row houses and garden apartments. The R5 district, as discussed above, is a medium-density residential district typically containing apartment buildings and two- and three-family row houses. The R6 district, though still a medium-density housing district, typically includes apartment buildings between 3 and 12 stories.

Public policies pertinent to the proposed project include the New York City Waterfront Revitalization Program (WRP) and the Criteria for the Location of City Facilities ("Fair Share" criteria) pursuant to Section 195 of the City Charter. (See the "Waterfront Revitalization Program" section, below, for a discussion of project impacts.) The proposed project would not impact the Fair Share policy because the project proposes the continued use of the Avenue V Pumping Station as a wastewater pumping station and does not propose the introduction or relocation of this use to a new area.

The Avenue V Pumping Station has been in operation at the site since approximately 1916. The proposed project represents the continuation of use for wastewater pumping purposes. Overall, the proposed project would not involve any changes to zoning or other public policies, and would not substantially affect regulations or policies governing land use; therefore, no significant impacts to land use, zoning, and public policy would result from the proposed action.

D. SOCIOECONOMIC CONDITIONS

The proposed project would not directly or indirectly change population, housing stock, or economic activities in the affected area. The proposed upgraded pumping station would be unstaffed. Seven NYCDEP employees would be relocated to other NYCDEP facilities. Therefore, no further analysis of socioeconomic conditions is required, and no significant adverse socioeconomic impacts would result from the project.

E. COMMUNITY FACILITIES AND SERVICES

The proposed action would not displace any public or publicly funded community facilities, nor introduce more than 100 new residents or workers to the area. The action would not affect schools, libraries, hospitals, or day care centers. As discussed in Section V, “Construction Impacts”, construction activities of the force mains would not result in extended periods of time where access to such facilities (e.g., schools) would be limited. The proposed action is not expected to affect the ability of the local police or fire department to provide protection services. As a result, no significant impacts to community facilities are anticipated with the proposed action.

F. OPEN SPACE

The proposed project would not change, diminish, or eliminate open space, nor would it reduce its utilization or aesthetic value. The force main along Shore Parkway would not affect the parkland, which is not publicly accessible. Potential impacts to natural resources and planned tree replacement plans are discussed in Section K, “Natural Resources”. As discussed below under the “Air Quality” section, the proposed project would not result in incremental concentrations of more than 1 part per billion by volume of hydrogen sulfide (H₂S) at the nearest sensitive receptors to the Avenue V Pumping Station. Upon completion of construction, the facility will also not result in any predicted significant adverse noise impacts. Upgrading the pumping station would not indirectly affect open space in the area by adding new residents or employees to the area. Therefore, no significant adverse open space impacts would occur with the proposed action. Impacts to open space during the construction period are discussed below under Section V, “Construction Impacts.”

G. SHADOWS

The proposed project would not result in structures or additions to existing structures that would cause an increase in shadows off the pumping station site. The project proposes to rehabilitate the existing Main Building but would not increase the height of the building. In addition, the superstructures of other buildings on the pumping station site would be demolished. Therefore, no further analysis of shadows is necessary, and the proposed action would not result in any significant adverse shadows impacts..

H. HISTORIC AND ARCHAEOLOGICAL RESOURCES

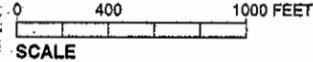
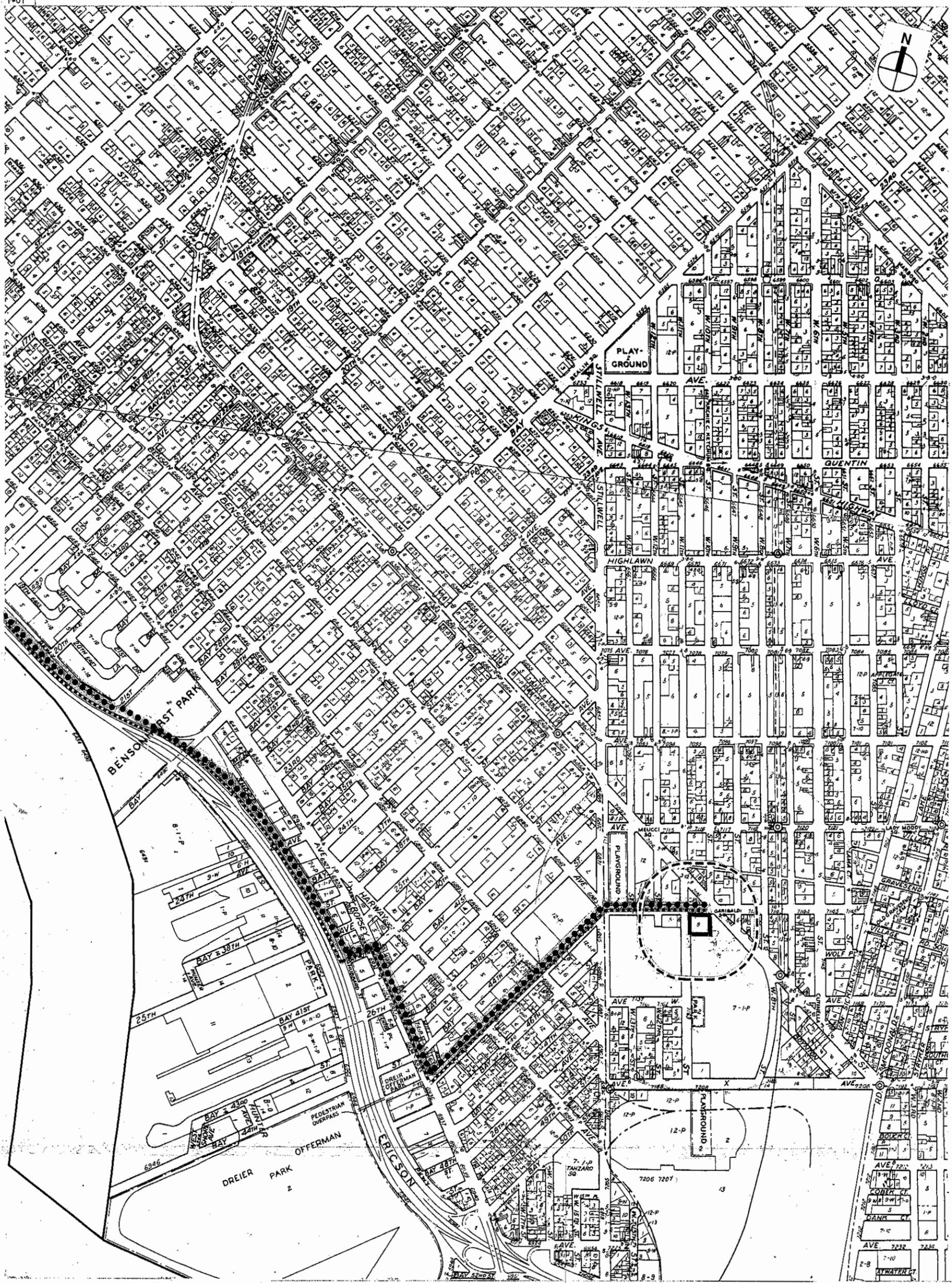
INTRODUCTION

As detailed in “Project Description,” the project site consists of the Avenue V Pumping Station site, located at the northern end of the block at the intersections of Avenue V, 86th Street, and West 11th Street, and the routes of the two proposed force mains—the dry weather flow force main and wet weather flow force main. The proposed Avenue V Pumping Station project would upgrade and rehabilitate the Main Building (the pumping station) and demolish the remaining four structures on the site. The proposed force mains would be located in the street beds and along the shoulder of Shore Parkway. This section considers the potential of the Avenue V Pumping Station project to affect archaeological and architectural resources.

The study area for archaeological resources is limited to the area that would be excavated for the project, since this is the area where any archaeological resources could be disturbed as a result of the proposed project. This includes construction of a new Generator Building, Wet Well extension, and other subsurface work required for the upgrading of the pumping station on the site, as well as the areas to be excavated for the force mains. Sections relating to archaeological resources and the prehistory and history of the area are based on the following reports; *Avenue V Pumping Station Phase 1A Archaeological Assessment*, prepared for the Avenue V Pumping Station site and the dry weather flow force main by Historical Perspectives, Inc. (HPI) in December 1998; *Avenue V Pumping Station Wet Weather Force Main Stage 1A Archaeological Assessment* prepared by Historical Perspectives, Inc. in May 2001; and *Avenue V Pumping Station Dry and Wet Weather Force Mains, Topic-Intensive Study* prepared by Historical Perspectives, Inc. in May 2001. These studies are available for review at NYCDEP, Office of Environmental Planning and Assessment.

The study area for architectural resources depends on the nature of the construction activities. At the Avenue V Pumping Station site, where proposed work would be expected to be visible at the end of project construction (demolition and construction of buildings), the study area for architectural resources is within 400 feet of the site (see Figures 9A and 9B). This is based on the assumption that direct impacts (e.g., where proposed construction and demolition activities might physically alter an historic structure or where construction activities might be close enough to a historic structure potentially to cause structural damage) of any significance would not occur outside this study area. This study area also accounts for indirect impacts (e.g., changes to the visual context of an architectural resource). The proposed installation of the force mains involves pavement breaking activities that may again affect architectural resources through ground-borne vibrations. Based on figures prepared by the American Society of Civil Engineers, the distance for potential damage to designated historic and eligible structures due to pavement breaking operations is 60 feet (discussed in more detail below). After construction, the force mains would not be visible and there would be no potential for contextual impacts. Therefore, the area of potential effect for force main construction has been defined as 60 feet.

Historic resources comprise officially recognized historic sites or structures—National Historic Landmarks (NHL), properties listed on the State and National Registers of Historic Places (S/NR), and New York City Landmarks (NYCL) and Historic Districts—and properties determined eligible for listing on the Registers or for landmark status.



- Avenue V Pumping Station
- Proposed Dry Weather Flow Force Main Route
- Proposed Wet Weather Flow Force Main Route
- Study Area Boundary (400' Perimeter)

Open-Land Uses

- Vacant Land
- Used Automobile Lot
- Farm
- Licensed Junk Yard
- Accessory Parking Lot
- Licensed Parking Lot
- Park & Outdoor Recreation

Residential Uses

- One-Family Detached
- One-Family Attached
- Two-Family
- Walk-Up Multiple
- Elevator Multiple
- Ground-Floor Retail
- Hotel

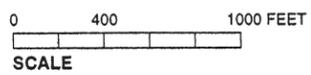
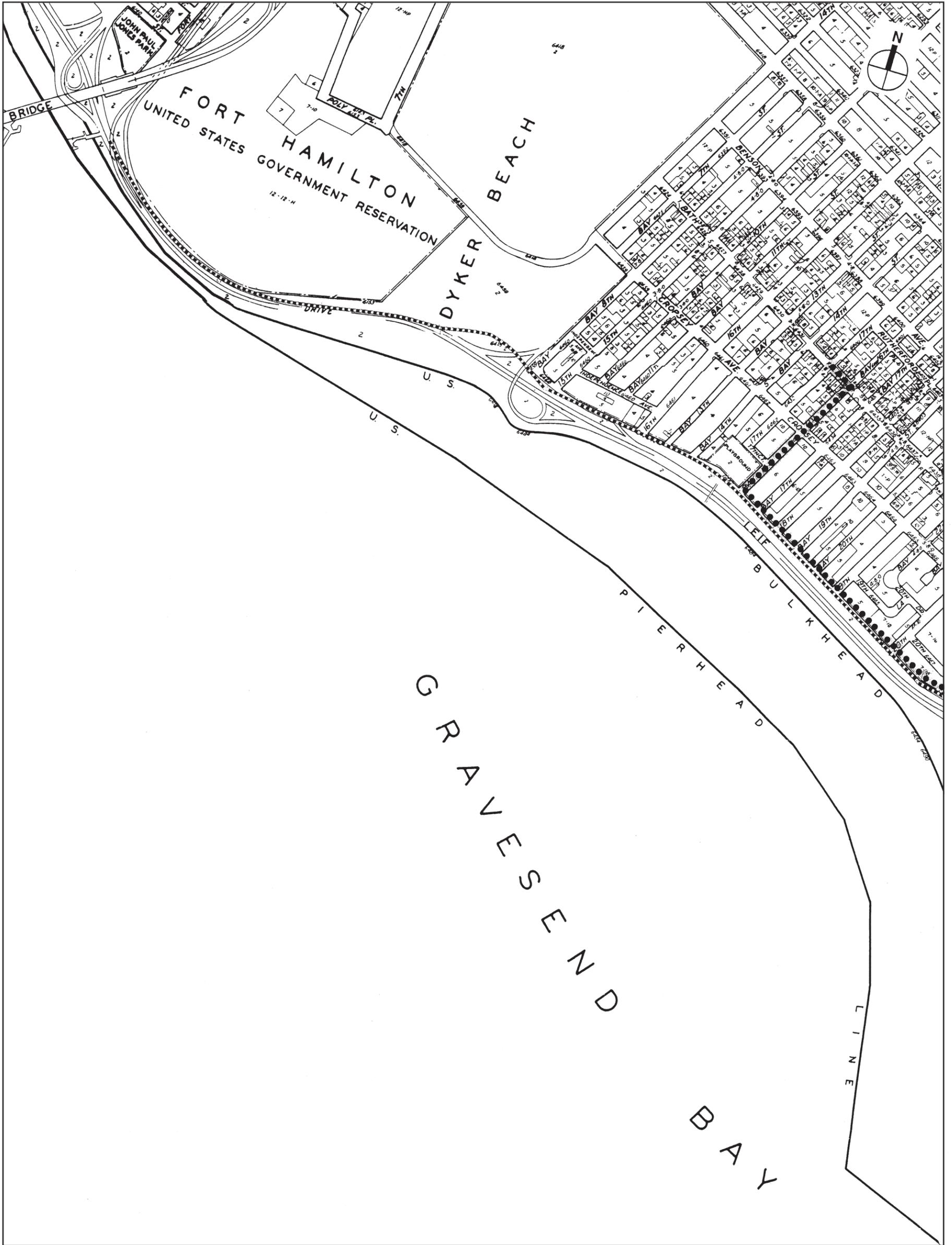
Non-Residential Uses

- Commercial & Retail
- Office
- Light Industry
- Warehouse & Storage Yard
- Automobile Storage & Service
- Heavy Industry
- Public & Private Institutions
- Transportation
- Predominant Use Is Followed by Subordinate Uses

(For continuation of map, see Figure B-1B)

AVENUE V PUMPING STATION

Project Site and Study Area
Figure 9A



..... Proposed Dry Weather Flow Force Main Route
 ●●●●● Proposed Wet Weather Flow Force Main Route

(For continuation of map, see Figure B-1A)

Open-Land Uses

- 1 Vacant Land
- 1-A Used Automobile Lot
- 1-F Farm
- 1-J Licensed Junk Yard
- 1-P Accessory Parking Lot
- 1-P Licensed Parking Lot
- 2 Park & Outdoor Recreation

Residential Uses

- 3 One-Family Detached
- 4 One-Family Attached
- 5 Two-Family
- 6 Walk-Up Multiple
- 7 Elevator Multiple
- Ground-Floor Retail
- H Hotel

Non-Residential Uses

- 8 Commercial & Retail
- 8-0 Office
- 9 Light Industry
- 9-W Warehouse & Storage Yard
- 10 Automobile Storage & Service
- 11 Heavy Industry
- 12 Public & Private Institutions
- 13 Transportation
- 7-10 Predominant Use Is Followed by Subordinate Uses

BACKGROUND HISTORY

PREHISTORIC PERIOD

The prehistoric (Native American) era on the south shore of western Long Island is traditionally divided into time periods based on prehistoric society's adaptations to changing environmental conditions. These are generally known as the Paleo-Indian (c. 12,000 to 9,500 Before Present (B.P.)), the Archaic (c. 9,500 to 3,000 B.P.) and the Woodland (c. 3000 to 500 B.P.).

Toward the end of the Wisconsin Glaciation, during the Late Pleistocene Epoch, the first humans are thought to have wandered across the exposed land bridge which connected Siberia and Alaska. These small groups of hunters were probably following roaming herds. The most distinctive weapon in the chipped-stone tool kit was the fluted point, which has been found in association with mammoth, mastodon, bison and horse remains at various sites in the southwestern United States. Although none of these "kill sites" are located east of the Mississippi, the discovery of campsites such as that at Port Mobil, Staten Island, suggest a scattered, highly mobile population in bands of approximately 20 individuals.

In the Northeast, the glacially lowered sea level exposed the broad coastal plain of which Long Island was a part, indicating that the project area would have been dry land during this period. From the locations of recorded sites in the Northeast, Paleo-Indians exhibited a marked preference for well-elevated land. Environmental characteristics which appear to have been attractive to Paleo-Indians include the proximity to major waterways, large fertile valleys, and the coastal plain, where the densest population of desired food animals was supported. The retreat of ice from Long Island c. 18,000 B.P and a global warming trend c. 14,000 encouraged Paleo-Indian settlement in the Northeast.

The warming trend at the end of the last glaciation transformed the northeastern coastal environment from tundra and conifer-dominated forests, to the present deciduous woodlands with generally modern distributions of fauna. During this Archaic period, these new hardwood forests and fauna attracted deer, wild turkey, moose and beaver. Due to the dwindling contribution of meltwater from disappearing glaciers, the reduced flow of streams and rivers promoted the formation of wetlands which attracted migratory waterfowl, and edible plant species and shellfish.

Although the Archaic diet was still based on hunting and gathering, the greater variety of plants available led to a wide array of plant processing tools, including the grooved ax, grinding stones, and mortars and pestles. Semi-nomadic life is still indicated, but wandering occurred within well-defined territorial limits, with seasonal movements between camps near exploitable resources. Numerous small multi-component sites have been found in the coastal areas of New York, such as on tidal inlets, coves and bays, and on freshwater ponds in Long Island. The Late Archaic Wading River complex, consisting of four sites on the north shore of Suffolk County, was found at the edge of a salt marsh.

During the Woodland Period, settlement patterns were substantially altered with the introduction of agriculture, the systematic cultivation of maize, beans, and squash possibly beginning as early as A.D. 1000. Pottery use became widespread, and during this time, large villages within palisaded enclosures were developed and occupied by semi-sedentary inhabitants. Preferred village/camp sites were in protected, elevated locations at the confluence of two water systems (tidal streams and bays). Shellfish and small game remained an important component of the Woodland diet. Shellfish refuse heaps, termed "middens," reached such large dimensions as to cover 1 to 2 acres.

When the first Europeans arrived in Long Island some 500 years ago, the Contact Period began. Native American settlement patterns incorporated seasonal hunting and gathering, with villages or hamlets established near planting fields. Two Native American groups were recorded in the vicinity of the project area, the Nayack and the Canarse. The Nayack had their planting fields and principal village at the present Fort Hamilton Reservation, probably near the water supply that is now Dyker Beach Park. A second settlement may have existed near the Gravesend Bay shore, located approximately at present 86th Street and 16th Avenue, and approximately 3,000 feet northeast of the project site. The chief settlement of the Canarse was in the present Canarse section of Brooklyn, approximately 4.8 miles northeast of the project site.

Nineteenth and 20th century research, survey, and excavation have revealed a strong Native American presence in Brooklyn. Archaeologist Arthur C. Parker identified two Indian sites in the vicinity of the project area, one at Fort Hamilton, described as “shell heaps or kitchen middens” and another in the same vicinity that was former lithic (stone) workshop. The Fort Hamilton site is also identified by the New York State Museum as Site #3611. In addition, archaeologist Reginald Pelham Bolton noted a major Indian trail traversing southwest Brooklyn, with Indian stations, such as planting grounds at Indian Pond, a now-filled-in freshwater pond at Avenue P and West 11th Street (about 3,000 feet north northwest of the Avenue V Pumping Station), and the Nayack site at present 86th Street and 16th Avenue established at various points along the route. In addition, a number of Native American trails branched from the main trail, and led to Gravesend Bay.

HISTORIC PERIOD

Prior to its incorporation into Brooklyn at the end of the 19th century, the project site and its vicinity was originally divided between the towns of Gravesend on the east and New Utrecht to the west and north. The town boundary between the two was at present 23rd Avenue.

Gravesend was settled by Lady Deborah Moody and her followers, who fled to the more tolerant rule of the Dutch West India Company in New Netherland to escape Puritan persecution in Massachusetts. They were joined by Nicholas Stillwell, a tobacco planter, and his comrades, who had been driven from their settlement in Manhattan by Native American attacks. Gravesend was the only English town founded in present Kings County, with a town patent (1645) in which a woman, Lady Moody, headed the list of patentees (land owners). With the English conquest of New Netherland in 1664, the existing town patent was confirmed. Given the unstable political climate of the last quarter of the 17th century, the town attempted to strengthen its title to the surrounding area with real estate purchases from the local Native Americans. A single road, known as Beach Lane or Gravesend Road, was laid out in 1660. It traversed the marsh and creeks which occupied the eastern end of the project area. It led southwesterly from Gravesend village to the shore near the foot of current 27th Avenue. Smaller paths subsequently appeared on the 1781 map. During the American Revolution, British forces landed within a mile of the village in neighboring New Utrecht, and General Cornwallis passed through in 1776.

The area that became the town of New Utrecht is located on “the Narrows,” the channel that runs between the southwestern edge of Long Island and the eastern tip of Staten Island, connecting the Atlantic Ocean to New York Bay. European settlement began with Cornelis van Werckhoven’s purchase of “the Nyack tract” from the Native Americans. Although the location is unclear, he built a house and mill, surrounded them with a palisade, likely in the area north of the project site in present Dyker Beach Park. His house was on the eastern slope of the Fort Hamilton bluff, with a nearby wharf. Settlement was continued by Jacques Cortelyou, Werckhoven’s children’s tutor/guardian, with 21 patents of 50 acres each granted to 19 people

and two retained for the benefit of the poor. By 1660, eleven houses and a blockhouse had been erected, surrounded by a palisades, and the first town charter was issued in 1661. Following the English invasion of the colony (1664) and its subsequent recapture in 1673 by the Dutch and English repossession that next year, the town returned to a quiet agricultural existence and became linked to neighboring settlements with the construction of Kings Highway (which passed through the village in the path of current 84th Street). A stone wharf, built as part of the private property of Denyse Denyse, still stands outside the project site area, west of Fort Hamilton Parkway. Settlement along the shoreline (generally 100 to 400 feet north of the project site sections along Shore Parkway) was sparse, although there were three roads along the shore connecting to and from Kings Highway and Gravesend Bay. Shore Road, mentioned as early as 1715, still exists northwest of the project area, beginning at 4th Avenue. On the 1781 Taylor and Skinner map, a redoubt, constructed by the British occupying forces, is shown west of Shore Road. The Cortelyou dock and the redoubt appear to have been on or adjacent to the project site. In 1776, during the Revolutionary War, 15,000 British troops approached New York City by the Narrows, invading New Utrecht Village and neighboring Gravesend. Colonial resistance was mounted on eastern slope of the Fort Hamilton Bluff, before its abandonment to the British.

In 1776, following the capture of the position, fortifications were built for the Hessian garrison, including a redoubt. After independence and in preparation for the War of 1812, an earthwork, named Fort Lewis was erected on the Fort Hamilton site. In 1814, a new, circular, masonry fort, Fort Diamond, was built. Construction of Fort Hamilton did not begin until 1824, and was strengthened in subsequent years during the 19th century.

As early as 1794, the beneficial atmosphere of the Gravesend Bay Shore was recognized and the Bath House erected by a group of New York City physicians for their invalid patients. It stood adjacent to the beach, slightly west of present 20th Avenue. Burned down, it was rebuilt, and in the latter decade of the 19th century, it was known as the Avon Beach Hotel. Bath Beach grew slowly because it was somewhat isolated, but it benefited from its proximity to Coney Island, which became a fashionable and increasingly popular recreational destination in the 1840s. Transportation links were continually improved, and they often passed through or near Bath Beach. During this period, Bath Beach developed as an affluent resort community. Inevitably, real estate developers recognized the potential profits to be had from the development of residential communities along Gravesend Bay, to the east of Bath Beach. By 1889, land had been leveled and two miles of streets had been completed along with 20 miles of fences and sidewalks. Arrangements for water were made with the Kings County Water Supply Company, and an elaborate system of sewerage installed, which discharged the sewage of Bensonhurst and Bath Beach in Gravesend Bay through two outlets at 15th and 22nd Avenues. By 1890, a long line of villas, houses, hotels, boating piers and yacht clubs along the bay shore from 15th Avenue to beyond 27th Avenue had been built. By 1905, the area had begun to decline, with lots near the shore subdivided into small, 20 foot or 25 foot by 100 foot building lots, and with more affluent patrons of the resorts having begun to move on to more exclusive areas. The declining popularity of Gravesend Bay as a resort destination may be attributed to a number of factors: pollution from the growing population, the advent of the automobile and the modern highway system, and perhaps competition from a revived Coney Island, after World War I.

To address the water pollution problems of Greater New York, beginning in 1903, the New York Bay Pollution Commission was formed to study existing conditions in New York Bay and to recommend proposals to improve water quality. The commission concluded that New York City, as well as many other municipalities on New York Harbor, were systematically discharging raw sewage, and the commission recommended ongoing and additional studies. This, in turn, led to the creation of a second commission in 1910—the Metropolitan Sewerage Commission, which

prepared a general plan for drainage, sewage collection, and disposal for the entire city. The methods of treatment proposed by the Metropolitan Sewerage Commission were used in the Avenue V Pumping Station and its four sister stations in Brooklyn. The two original Avenue V Pumping Station buildings, the main pump room along Avenue V (Main Building), and the pump well, screen, and grit chamber (Wet Well) to the south were built between 1911 and 1916 and designed by Albert L. Martin, employed by the Department of Public Works.

The Bensonhurst area became heavily populated soon after being linked to Manhattan in 1915 by the 4th Avenue subway, with brick houses for two to three families and four- to six-story apartment buildings erected in the 1920s, occupied mostly by Italians and Jews from the Lower East Side of Manhattan. In 1939, the WPA Guide to New York described the Bath Beach section of Bensonhurst as a cluster of small houses and rundown mansions and hotels leading to a deserted beach. The construction of the Bensonhurst/Bath Beach/ Fort Hamilton section of Shore Parkway in the late 1930s cut the waterfront communities from the water with which they had been originally associated. Massive filling, especially within the project site west of Bay 32nd Street, was undertaken to bring the area up to the required grade for construction of the road. Construction of the Verrazano-Narrows Bridge at the western end of the project site, completed in 1964, further required the construction of an extensive connector complex to integrate the parkway and bridge traffic. During the early 1960s, the pumping capacity of the station was increased, and the Switchboard Room and Pump Room B built at the Avenue V Pumping Station site.

In the 1980s, immigrants from Asia and the Soviet Union moved into the neighborhood, as did other ethnic groups, such as Greeks, Koreans, Israelis, Poles, and Arabs. The population of Bensonhurst is mostly lower middle class and tightly knit, with most Italians living along 18th Avenue between 63rd and 86th Streets and along 86th Street between 14th Avenue and Bay Parkway.

EXISTING CONDITIONS

ARCHAEOLOGICAL RESOURCES

Phase 1A Findings

To evaluate the possibility that archaeological resources may exist on the project site, HPI conducted a Phase 1A Archaeological Assessment of the Avenue V Pumping Station site and the route of the dry weather flow force main in December 1998. In May 2001, HPI prepared a Phase 1A Archaeological Assessment of the route of the wet weather flow force main that would not overlap with the route of the dry weather flow force main, namely Bay 16th Street between the Shore Parkway and Bath Avenue, and Bath Avenue between Bay 16th Street and 17th Avenue. The following discussion summarizes the findings of the research, focusing first on the potential for prehistoric (Native American) archaeological resources and then on the potential for historic period (beginning in the 17th century) resources. Prehistoric resources are typically shallowly buried, within 3 to 4 feet of the pre-development surface. It is also possible that the subsequent addition of deep fill layers may have served to protect these types of resources. Historic-period resources may consist of privy and well shafts, which are often filled with refuse related to the dwellings and their occupants, schools and their pupils and employees, or business and their workers. These shafts, 5 or more feet deep, usually survive all but the deepest post-depositional disturbance and frequently provide the best remains recovered on sites, including animal bone, seeds, glass, metal, stone, ceramics, and sometimes leather, cloth, wood, and even paper. By analyzing such artifacts, archaeologists can learn much about the diet, activities, and customs

and technology of the former occupants. Since the first recorded sewer lines were installed throughout the area in 1889, 1890 is considered the year after which such shaft features were not a necessity for inhabitants and workers in the project area.

Avenue V Pumping Station Site.

Potential Prehistoric Resources. The Avenue V Pumping Station location has been identified to have a strong potential for having hosted pre- and proto-historic settlements and camps. In its pre-development state, the project site was a well-drained, elevated land, which would have been attractive to and exploited by prehistoric Americans.

The only recorded major construction disturbance on the site is the construction of the Avenue V Pumping Station and the numerous mains and utilities that extend from the pumping station structures to the surrounding streets. These include 36- to 24-inch sanitary sewers, a 90-inch storm sewer, and 24- to 30-inch force mains, as well as meter and valve vaults and water lines. The depth of this disturbance is indicated from the soil boring on adjacent Avenue V (MR-1), which records a massive fill layer 25 feet thick. Prior to 19th- and 20th-century development, historical maps depict the area as dry land, but at present the water table extends approximately 14 feet into the fill layer. This indicates deep excavation disturbance, related to the construction of the Avenue V Pumping Station. Given the deep disturbance recorded by the soil boring at the site, any potential prehistoric resources, if they existed, would have been destroyed. Therefore, the site is not sensitive for prehistoric resources and no further study or testing for potential prehistoric resources is recommended. In a letter dated May 6, 1998, the New York City Landmarks Preservation Commission (LPC) indicated that the site has no archaeological significance.

Potential Historic-Period Resources. As described above, there is no record of any construction on the site prior to the Avenue V Pumping Station. In addition, the site has been extensively disturbed by construction of the pumping station building and associated utilities. Therefore, it is not sensitive for historic-period resources, and no further study or testing for potential prehistoric resources is recommended. In a letter dated May 6, 1998, LPC indicated that the site has no archaeological significance.

Dry Weather Flow Force Main.

Potential Prehistoric Resources. The area through which the portion of the proposed dry weather flow force main between the Avenue V Pumping Station and Shore Parkway at Bay 32nd Street would be built, was, in its pre-development state, a combination of well-drained, elevated lands, which would have been attractive to Native Americans, and marshland. Therefore, it would have a strong prehistoric potential for Native American occupation and moderate potential for having been utilized as middens.

However, soil borings taken along the route of the proposed dry weather flow force main from Avenue V to the Shore Parkway at Bay 32nd Street indicate low archaeological sensitivity. Borings show a deep fill overmantle ranging from seven to 18.5 feet in depth, beneath which there is no evidence of organic stratum representing a surviving, pre-fill surface, or extremely thin organic layers mixed with historic fill. No shell fragments indicative of potential shell middens were recorded, nor any other evidence of precontact occupation. Therefore, it is likely that prior to historical filling activities and construction, grading and soil replacement took place, eliminating the predevelopment surface, including strata potentially sensitive for precontact archaeological remains. Consequently, this portion of the project site possesses a low sensitivity for prehistoric archaeological resources.

The portion of the proposed dry weather flows force main along Shore Parkway between Bay 32nd Street and the Verrazano-Narrows Bridge was constructed on hydraulic fill removed from Gravesend Bay. However, it is possible that the inundated land was exposed during the Paleo-Indian period, creating the shallowly inundated areas which are conducive to the establishment of tidal marsh environments that was, therefore, attractive to Native Americans for food procurement. With the subsequent sea level rise, which slowed by about 4,000 to 2,000 B.P. (during the Archaic and/or Woodland periods), and has slowed even more to the present, prehistoric and even historic-period (post 17th century) Native American sites in these areas would lie beneath the current water table, as well as under historical fill and several feet of accumulated marsh mat. The land where shallows existed along the shoreline of Gravesend Bay before the 1930s, upon which most of the proposed force main would be laid, would have been ideal for historic exploitation prior to sea level rise. Due to the changing sea level, and the documented presence of prehistoric and early historic-period Native Americans in the vicinity of the project area, it is theoretically possible that the area in the path of the proposed force main was occupied at some time during the prehistoric era. Therefore, due to the possibility that the land on which the force main would be constructed may have once been utilized by Native Americans, the portion of the proposed force main along Shore Parkway between Bay 32nd Street and the Verrazano-Narrows Bridge has a low potential for finding prehistoric remains.

Therefore, no further study or testing for prehistoric resources is recommended along the route of the proposed dry weather flow force main.

Potential Historic-Period Resources. The locations of historic dwellings or commercial structures potentially within or in proximity to the project site indicate a high potential for the remains of outbuildings and shaft features (privies and wells) to be found in the area. On Avenue V and on 27th Avenue between Stillwell and Bath Avenues, deep disturbance recorded by soil borings indicates that any historic-period resources relating to 19th-century structures would have been destroyed.

23 areas of potential historic-period sensitivity were identified along the remainder of the route of the dry weather flow force main. They are described below:

- The presence of the African Methodist Episcopal Church was noted abutting the route of the proposed dry weather flow force main on 27th Avenue. Built in 1869, the 1890 map shows the rear of the sanctuary abutting the west side of 27th Avenue, between Bath and Harway (Cropsey) Avenues. The rear of the church lot extended approximately 40 feet into the unbuilt 27th Avenue roadbed, and, therefore, into the project site. Before the consolidation of this part of Kings County with the cities of Brooklyn and New York at the end of the 19th century, many churches tended to have their own cemeteries, which were often not, or poorly, recorded on the historical maps and documents.
- The Public School No. 3, established sometime between 1868 and 1873, when it first appears on maps, included the southern 50 feet of the present Cropsey Avenue roadbed at the southwest corner of Cropsey Avenue and Bay 41st Street.
- The James Cropsey Lumber Yard, as shown on the 1890 map, occupied the east and west sides of Cropsey Lane (Bay 35th Street). The project site includes part of the yard and lumber shed, office, and storage facilities for lime and cement. It is possible that some of the structures on this property as shown on the 1873 map were residences in the vicinity of the lumberyard.

- Nineteen home lots that may contain archaeological resources associated with historic-period occupation buried below the fill are located in locations on 27th Avenue, Cropsey Avenue, and Shore Parkway.

In addition, Denyses Wharf, called the Quartermaster's Wharf on the 1911 map and built of earth and stone, predates the establishment of the Fort Hamilton military reservation. Adjacent to present Fort Hamilton, Denyses Wharf extended from the shore into the project site, roughly in the area of the entrance to Fort Hamilton east of the Shore Parkway. The earliest detailed map depicting the wharf, from 1826, shows the outline of a portion of the wharf to be the same as in 1911. With the construction of Shore Parkway, the shore was extended, and as with other piers and wharves along the shore, Denyses Wharf was presumably left in place and surrounded by hydraulic fill pumped from the bay floor. Because of the early date of the wharf and the potential for the presence of 18th and early 19th century fill within the wharf, the project site section of Denyses Wharf has a strong historical archaeological potential.

Wet Weather Flow Force Main.

Potential Prehistoric Resources. One boring taken along the route of the wet weather flow force main, on Bay 16th Street, 145 feet south of 17th Court, showed the presence of a shell, at approximately the location where the high water mark was located in the late 19th and early 20th centuries. However, the presence of shell was too sparse to indicate a midden, indicating that it was likely a naturally occurring shell. In addition, there was no a peat layer that is usually associated with an inundated marshland. Historical and cartographic research indicates that the southern section of the route of the proposed wet weather flow force main was formerly along the shore of Gravesend Bay, both in the water and in locations regularly inundated by daily tides. However, widespread marsh areas are not recorded in the area, except in the vicinity of Dyker Beach Park, west of current Eighth Avenue. As described above, due to the changing sea level and the documented presence in the vicinity of prehistoric and early historical period Native Americans, it is possible that the land on which the wet weather flow force main would be laid was occupied at some time by Native Americans. However, since there were areas east and west of the proposed site of the wet weather flow force main that were occupied by Native American settlements, the route of the proposed wet weather flow force main has been determined to have a low prehistoric potential. Consequently, no further research or testing is recommended for prehistoric resources along the route of the proposed wet weather flow force main.

Potential Historic-Period Resources. Historic maps indicate that there were structures within the path of Bay 16th Street, between 17th Court (the original historic shoreline) and Bath Avenue, along the route of the proposed wet weather flow force main. Historic maps indicate that some of these structures were erected by 1873, and possibly even earlier, by 1852. Two areas of potential historic-period sensitivity are shown on Figure 16 and are described below:

- A private estate, belonging to the Voorhees family, was located overlooking Gravesend Bay. The building nearest the water, the Willowmere House, was shown as a moderate-sized house in 1852. By 1890, it had more than doubled in size, and by 1895, the historic map labeled the structure a hotel, with multiple bathing houses. It was enlarged again by 1906, and there was a N.Y. & N.J. Telephone Exchange on the property. Part of the west wing of the hotel structure, containing the kitchen, was in the eastern portion of future Bay 16th Street north of 17th Court, on the block between present 17th Court and Cropsey Avenue. Also partially in the path of future Bay 16th Street, on its western side, were the "helps quarters" associated with the Willowmere House; and adjacent to these buildings was the hotel.

- Almost the entire two blocks north of present Cropsey Avenue, between 17th Avenue and Bay 19th Street, except for the parcel belonging to the Voorhees family, described above, is shown on the 1873, 1877, 1889, and 1890 historic maps as belonging to Archibald Young. His residence was approximately 60 square feet. This structure was destroyed when New Utrecht Avenue (later Bay 16th Street), was constructed sometime before 1906. The structure was completely within the path of future Bay 16th Street. Also within the path of Bay 16th Street, to the north of the structure, was a well, as well as two small buildings. One was an ice house and a one-story unidentified structure, possibly a privy.

Due to the past presence of these historic structures and the well and possible privy in the path of the wet weather flow force main on Bay 16th Street, the identified sensitive areas of the roadbed have a high potential for archaeological resources. As described above, a sewer system was in place by 1889. Pipes ran along Cropsey Avenue, 17th Avenue and on Bath Avenue between 17th Avenue and Bay 16th Street (within the proposed route of the wet weather flow force main). There were no water pipes in the area until 1895, when a 4-foot main on Bath Avenue and a 6-foot main on Cropsey Avenue were installed. Therefore, these structures predate the installation of sewer and water services.

Soil borings indicate that there is fill to a depth of 4.5 feet to 9.5 feet in the potentially sensitive block between 17th Court and Cropsey Avenue, relating to the Voorhees property. However, the level of fill may be underestimated, because much of the fill was sand pumped from the bay in the 1930s, and may have been misinterpreted as natural. Therefore, it is possible that as much as 15 feet of fill was deposited in this area. If there is 9 to 15 feet of fill covering the original surface associated with the Willowmere structures on the block, archaeological remains that may be contained in shaft features, such as wells, privies, and cisterns, associated with the late 19th-century hotel that may have been protected from the disturbance caused by the installation of water and sewer pipes and other buried utilities, and may exist beneath the fill.

As described above, the block on Bay 16th Street between Cropsey and Bath Avenues is sensitive for archaeological remains relating to the Young structure. Both the well and the potential privy north of the Young house are shaft features that may contain valuable remains that may help archaeologists learn about the diet, activities, customs, and technology of the former occupants. Since the first recorded sewer lines were installed throughout the area in 1889, it is only after 1890 that shaft features were not a necessity for inhabitants and workers in the project area. Soil borings for the block indicate that fill layers range from 3 to 9.5 feet on Bay 16th Street near Cropsey Avenue and 9.5 feet near Bath Avenue. In the middle of the block on Bay 16th Street, fill was recorded at 6 feet. It is possible that the house was set on a rise, so less fill was need to the level the ground in this location. Based on the depth of the fill, the fill may have been barely sufficient to cover the original surface on which the house stood, but was certainly enough to protect the well. This is also the case with the icehouse and the potential privy, which may have shaft features buried beneath the fill.

Bath Avenue had been built by 1852. However, there were no structures directly fronting on the avenue until 1906. Therefore, there would be no potential for any archaeological remains to be located on Bath Avenue between Bay 16th Street and 17th Avenue, the proposed route of the wet weather flow force main. This portion of the proposed wet weather flow force main route is not archaeologically sensitive for historic-period resources.

Topic Intensive Study Findings

As described above, the two Phase 1A reports identified a total of 25 properties (23 within the route of the dry weather flow force main and two within the route of the wet weather flow force

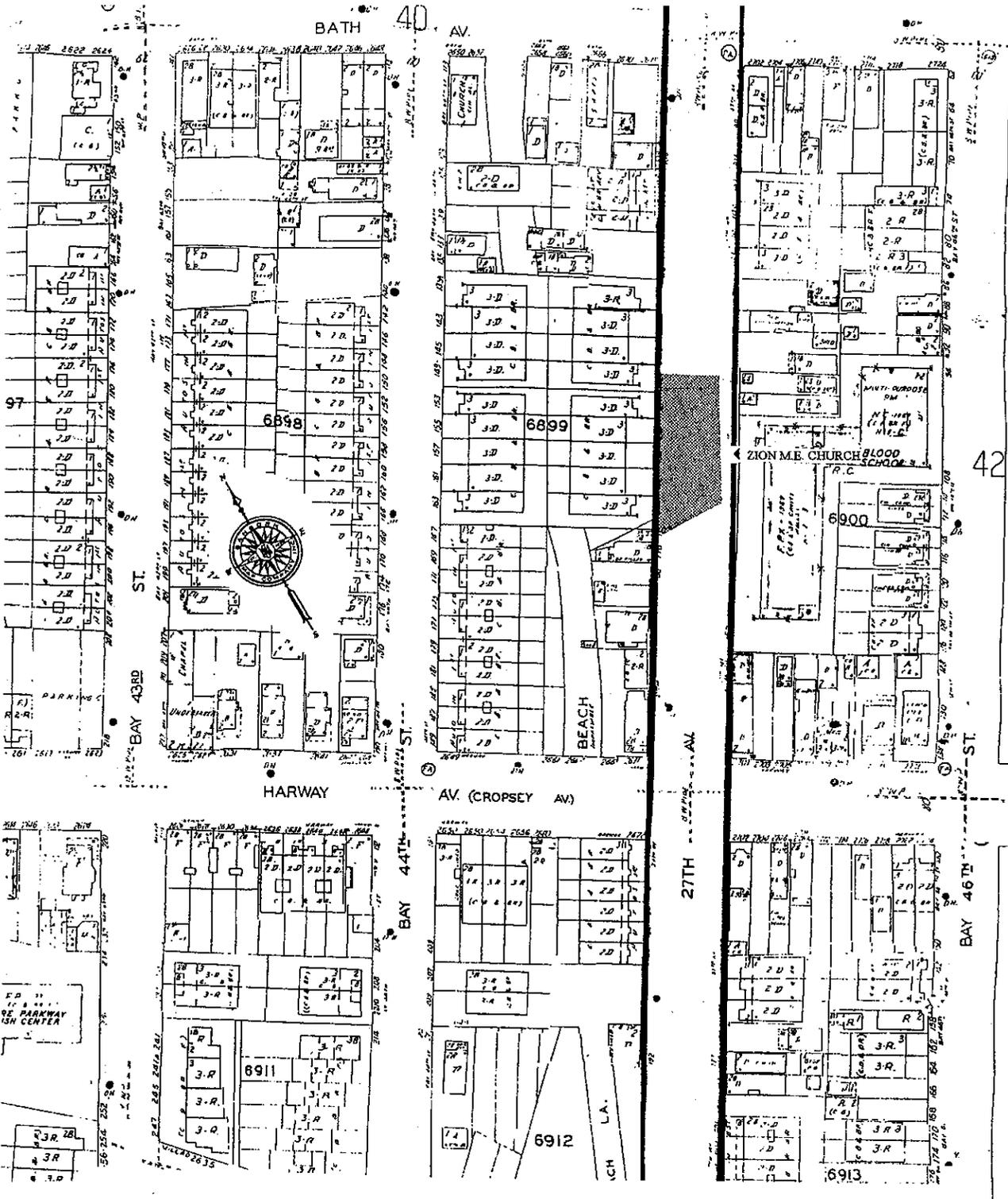
main) as having potential archaeological sensitivity. In comments dated June 14, 1999, LPC concurred with the findings of the Phase 1A report prepared for the dry weather flow force main and recommended the preparation of a Topic Intensive Study to provide a more intensive examination of the 22 properties sensitive for 19th century residential and commercial occupation of the project site, to include additional directory, census, real estate, tax, and deed research.* Since the Phase 1A report for the wet weather flow main identified two additional archaeologically sensitive areas, these two properties were included in the Topic Intensive Study, prepared by HPI in May 2001. The study attempts to focus future archaeological investigation on those properties that have the greatest potential for providing data that will address both general and specific research topics. The findings of this study are summarized below.

Dry Weather Flow Force Main.

The Topic Intensive Study found that nine of the properties identified in the Phase 1A study for the dry weather flow force main warrant further archaeological investigation should they be impacted by project construction (see Figures 10-13). The research potential of these properties is described below.

- *African Methodist Episcopal Zion Church of Gravesend:* Research does not record the presence of a cemetery within the church property; however, given the low probability that the churchyard was employed as a burial ground and the possibility that churchyard boundaries may have been indistinct, further archaeological testing is advised should construction impacts extend to the depth of potential historic burials. If any burials are present, they would be expected to be located within two- to 15- feet of the present surface. This area of sensitivity consists of the western $\frac{3}{4}$ of the 27th Avenue roadbed at a point roughly midblock between Bath and Harway Avenues (see Figure 10)
- *Robert Euin Property:* archeological study may provide comparative data for the study of consumer choices in the less affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage beyond the nuclear family level. Potential shaft features associated with this property could lie between three and 18.5 feet below the surface. This area of sensitivity is located on Cropsey Avenue south of 26th Avenue (see Figure 11).
- *B. McGetrick Property:* archeological study may provide comparative data for the study of consumer choices in the less affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage beyond the nuclear family level. Potential shaft features associated with this property could lie between three and 18.5 feet below the surface. This area of sensitivity is located on Cropsey Avenue at the intersection with 26th Avenue (see Figure 11).
- *James McBride Property:* archeological study may provide comparative data for the study of consumer choices in the less affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage beyond the nuclear family level. Potential shaft features associated with this property could lie between three and 18.5 feet below the surface. This area of sensitivity is located on Cropsey Avenue north of 26th Avenue (see Figure 11).

* Denyses Wharf was excluded from the Topic Intensive Study since additional research directed at finding out more information on residential and commercial occupants would not have applied to this resource.



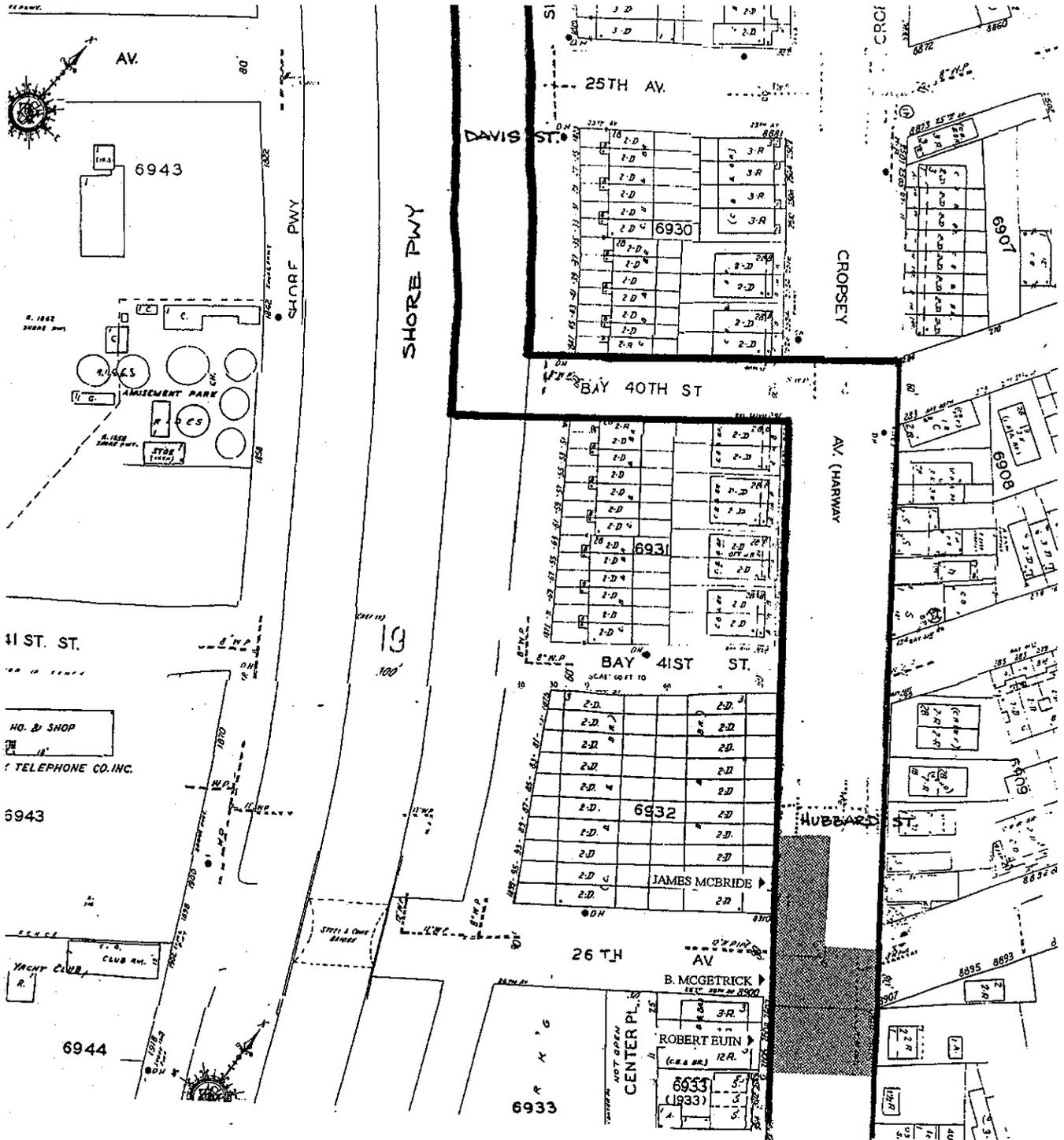
Areas of Final Archaeological Sensitivity – Current Sanborn Insurance Map
 27th Avenue from Bath Avenue to South of Harway Avenue
 (HEAVY OUTLINE INDICATES PROJECT SITE BOUNDARIES)

■ – Areas of Final Archaeological Sensitivity

**AVENUE V
 PUMPING
 STATION**

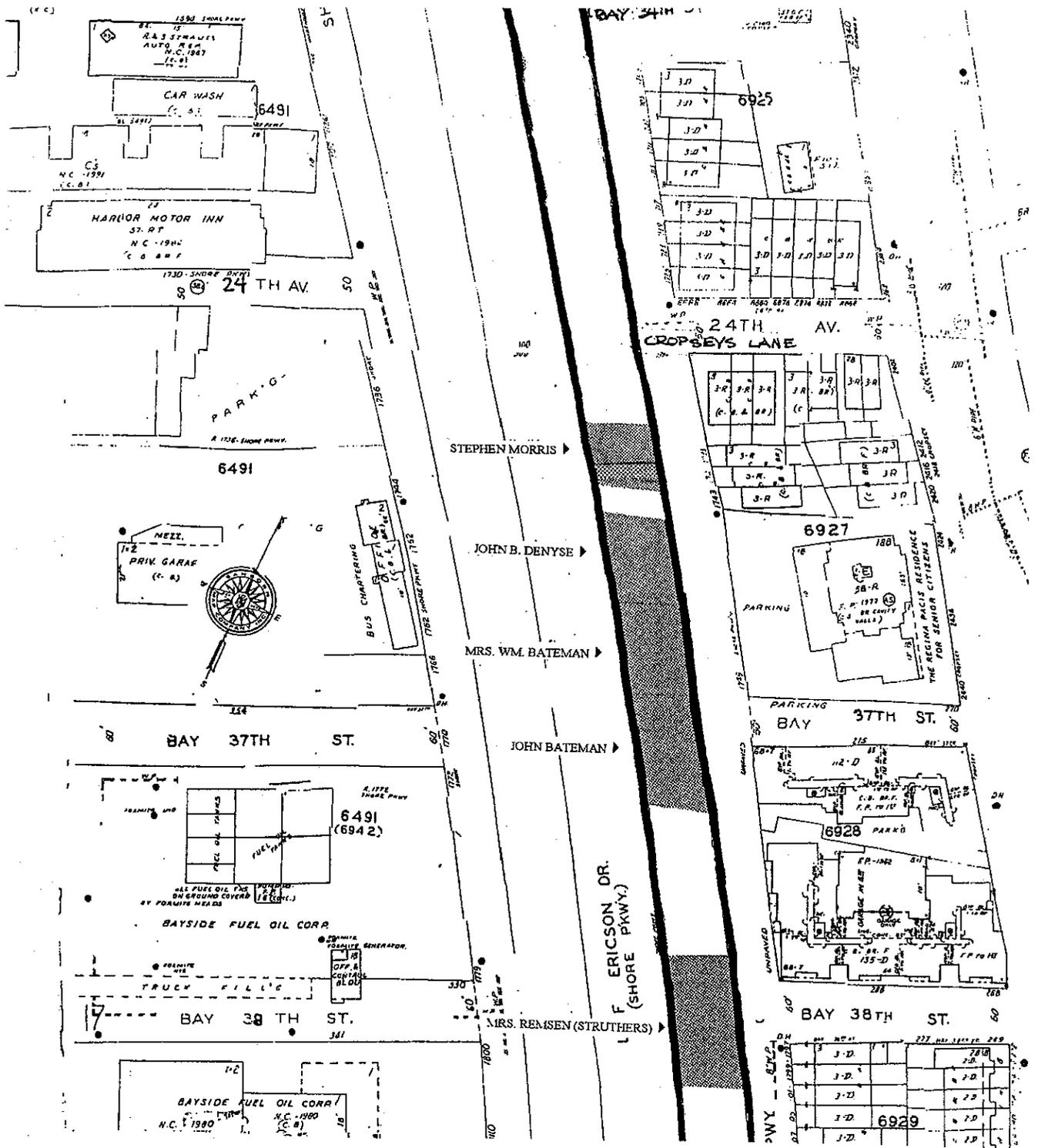
Areas of Potential Archaeological Sensitivity

Figure 10



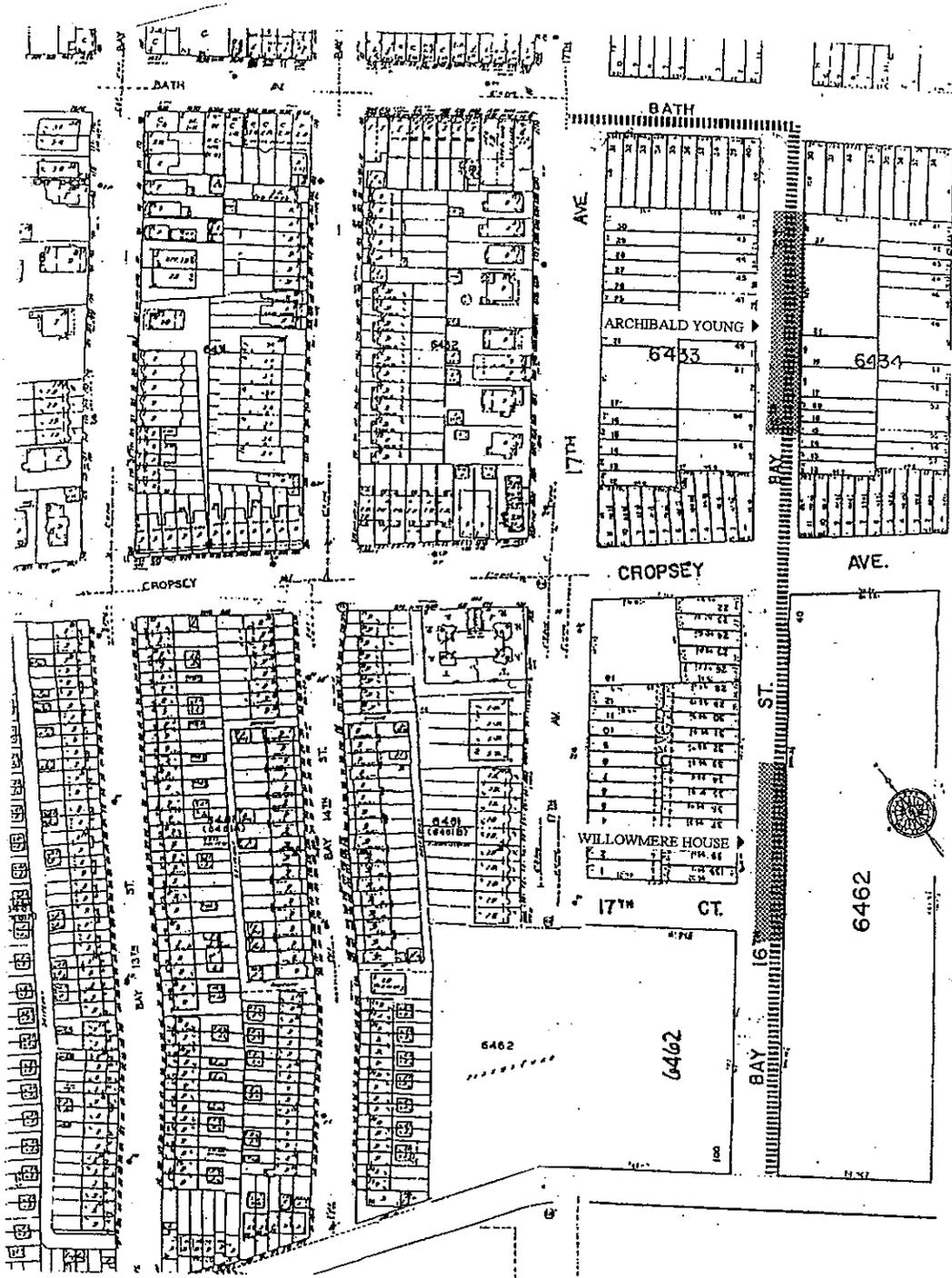
Areas of Final Archaeological Sensitivity – Current Sanborn Insurance Map
 Crocsey Avenue from 26th Avenue to Bay 40th Street, Bay 40th Street to the north
 shoulder of Shore Parkway, Shore Parkway to the line of 25th Avenue
 (HEAVY OUTLINE INDICATES PROJECT SITE BOUNDARIES)

■ – Areas of Final Archaeological Sensitivity



Areas of Final Archaeological Sensitivity – Current Sanborn Insurance Map
 Shore Parkway from the line of Bay 38th Street to Bay 34th Street
 (HEAVY OUTLINE INDICATES PROJECT SITE BOUNDARIES)

■ – Areas of Final Archaeological Sensitivity



Project Site 

Areas of Final Archaeological Sensitivity – Current Sanborn Insurance Map
Shore Parkway to Bath Avenue

 – Areas of Final Archaeological Sensitivity

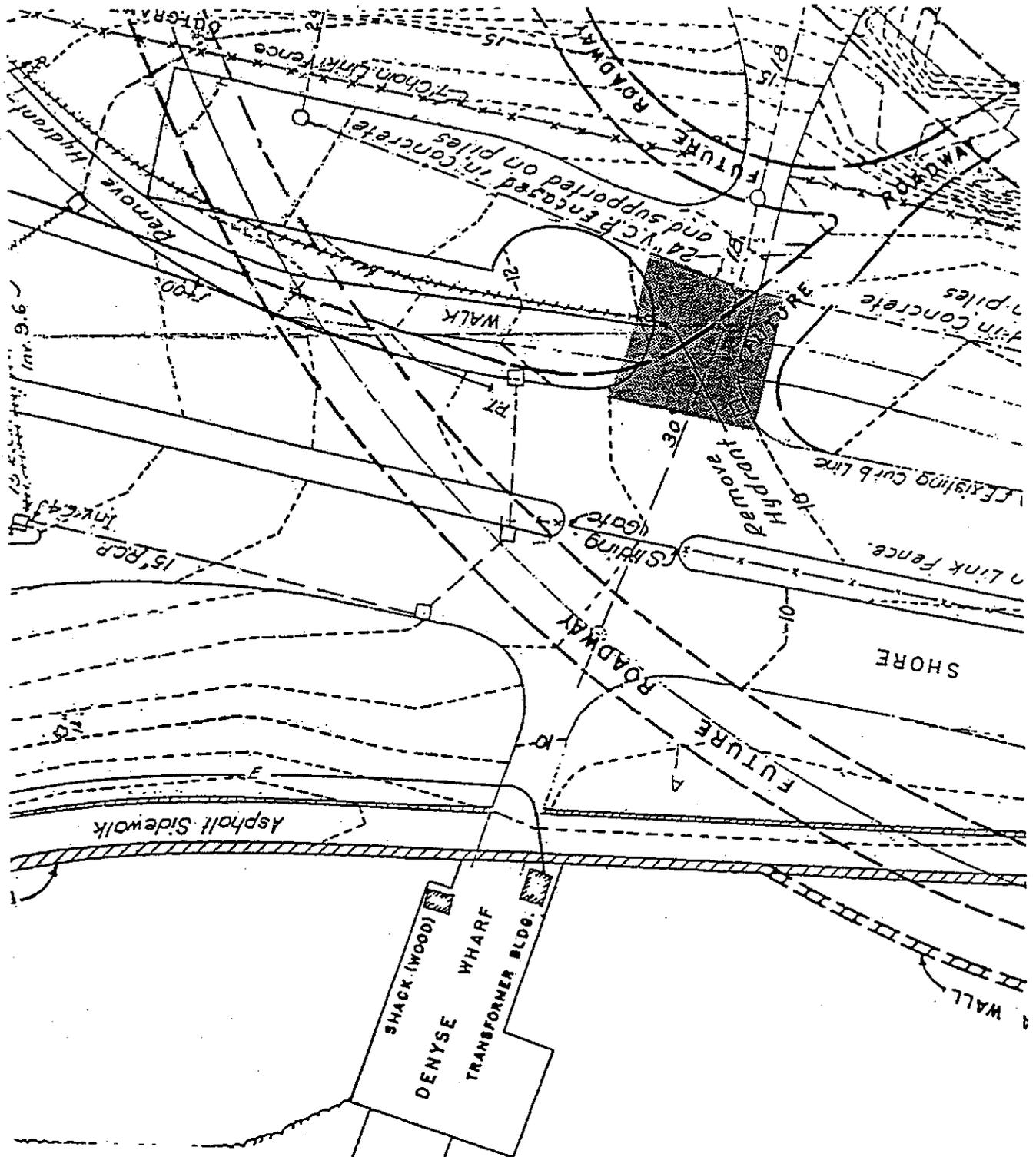
- *Mrs. Remsen Property*: archeological study of the area occupied by the Struthers home lot may provide comparative data for the study of consumer choices in the more affluent social class of area residents.¹ The property could also provide archaeological data related to changes in household developmental stage. Potential shaft features associated with this property could lie between three and 12 feet below the surface. This area of sensitivity is located on the shoulder of the Shore Parkway at Bay 38th Street (see Figure 12).
- *John Bateman Property*: archeological study may provide comparative data for the study of consumer choices in the more affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage. Potential shaft features associated with this property could lie between three and 12 feet below the surface. This area of sensitivity is located on the shoulder of the Shore Parkway at Bay 37th Street (see Figure 12).
- *Mrs. William Bateman Property*: archeological study may provide comparative data for the study of consumer choices in the more affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage. Potential shaft features associated with this property could lie between three and 12 feet below the surface. This area of sensitivity is located on the shoulder of the Shore Parkway north of Bay 37th Street (see Figure 12).
- *John B. Denyse Property*: archeological study may provide comparative data for the study of consumer choices in the more affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage. Potential shaft features associated with this property could lie between three and 12 feet below the surface. This area of sensitivity is located on the shoulder of the Shore Parkway at a point roughly midblock between Bay 37th Street and 24th Avenue (see Figure 12).
- *Stephen Morris Property*: archeological study may provide comparative data for the study of consumer choices in the more affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage beyond the nuclear family level. Potential shaft features associated with this property could lie between three and 12 feet below the surface. This area of sensitivity is located on the shoulder of the Shore Parkway south of 24th Avenue (see Figure 12).

In addition, the potential site of Denyses Wharf, located roughly in the roadbed of the Fort Hamilton entrance east of the Shore Parkway at a depth of between 0.5 and at least 18 feet below the surface, also remains archaeologically sensitive (see Figure 14). This potentially sensitive area warrants further investigation should the proposed project have the potential to impact this resource.

Due to limited research potential, no further archaeological investigation is recommended for the remaining thirteen properties identified in the Phase 1A report for the dry weather flow force main. These properties and the reasons for which they were determined not to warrant further investigations are discussed below.

- **Public School No. 3**: It is not likely that privies for the school would have been located in the front of the schoolyard property along a main street (Cropsey Avenue). A 1929 map shows the location of “water closets” along the rear lot line behind the school (east of and outside the project site) where it is likely that earlier privies prior to the installation of

¹ In 1873, Robert Struthers occupied a portion of a larger property that became owned and occupied by the Remsen family by 1890.



Grading and Drainage Plan, Brooklyn Anchorage, Narrows Bridge
1960

Contract No.NB-5B, Drawing 80, Triboro Bridge and Tunnel Authority,
Amman & Whitney Consulting Engineers, July 1 (Scale 1" = 40')

 - Area of Potential Archaeological Sensitivity for Denyses Wharf

sewers would have been located. Therefore, it is unlikely that shaft features related to school usage would be located on the project site and no further study of such resources is warranted.

- J. Carter Property: The only name that could be associated with the property through documentary research was J. Carter, who cannot be identified as residing on the site. Based on the lack of documentation of the residents, this property is not considered eligible for further archaeological investigations.
- Heirs of A. Voorhies Property: A one-story woodframe dwelling stood on the east side of 27th Avenue in the roadbed approximately 95 feet north of Cropsey Avenue. However, none of the census or directory information related to the several A. Voorhies's in Gravesend could be definitively linked to this property. Based on lack of documentation of the residents, this property is not considered eligible for further archaeological investigations.
- James Carter Property: The James Carter household underwent a transformation from a nuclear family in 1880 to a family with a 21-year-old son, his co-workers as boarders and a servant by 1900. Since water and sewer service was introduced in the project site circa 1889 (obviating the need for shaft features such as privies, wells, and cisterns), and the changes in the household would have occurred after 1890, it is not likely that further study of this property would provide relevant archaeological data.
- John Zimmermann Property: The John Zimmermann household underwent a transformation from a married couple in 1880, to adding children in 1883, to widowhood and death of the head of the household sometime after 1893. Since changes in the household beyond the nuclear family level would have occurred after 1890 after water and sewer service was introduced in the project site, it is unlikely whether further study of this property would yield relevant archaeological data.
- Joseph Stryker Property: Documentary research including census and directory research could not link the name Stryker to this homelot. Based on the lack of documentation of the residents of the property, no further investigation for historical period archaeological resources is recommended.
- A. Saeger Property: Though the name A. Saeger appeared for the first time on an 1873 map, no Saeger could be linked with the property through directory or later census records. Based on lack of documentation of residents at the property, no further investigation for historical period archaeological resources is recommended.
- C.G. Gunther Property: Due to inaccuracies in the mapping of this property, where maps after 1873 place the property outside the project site, it is recommended that time and resources for testing be allocated on other properties on the project site that possess a greater research potential.
- A. Voorhies Property: Though a number of Voorhies's lived in Gravesend, none can be linked definitively to the project site homelot. Based on the lack of documentation, the A. Voorhies property is not considered eligible for further archaeological investigations.
- James Cropsey Lumberyard: No residents could be identified in the lumberyard area. Though buildings associated with the lumberyard including a shed, office, and storage facilities, were identified it is not likely that traces/remains of structures associated with a commercial lumberyard would possess significant archaeological, technological, or

architectural significance. Therefore, this property is not considered eligible for further archaeological investigations.

- **H.W. Cropsey Property:** Historic maps indicated that the Cropsey house commanded a prime shoreline position. Therefore, it is unlikely that the residents would have placed shaft features such as privies on the beachfront portion of their property, in the area where the proposed force main would extend. Given that the probability of encountering shaft features on this portion of the project site is considerably lower than other properties that have been identified as sensitive for such features, no further archaeological investigations are recommended for the H.W. Cropsey property.
- **Mrs. L. Hegeman Property:** Though cartographic evidence indicates L. Hegeman owned the property, documentary evidence of the residents is very limited. This contrasts strongly with the more complete documentary data available for other affluent residents, which combined with the archaeological record would provide a much fuller understanding of the cultural lifeways in the project area. Therefore, it is recommended that time and resources for testing be allocated for other properties that possess a better research potential.
- **S. Fleet Speir Property:** Little documentary evidence could be found linking residents to this residential property. In addition, this house commanded a prime shoreline position, and it is unlikely that shaft features such as privies would have been placed between the home and Gravesend Bay. Therefore, based on the little documentary evidence of the residential occupation of the property and lower likelihood of encountering shaft features in this portion of the project area as opposed to others, no further archaeological investigations are recommended.

Wet Weather Flow Force Main.

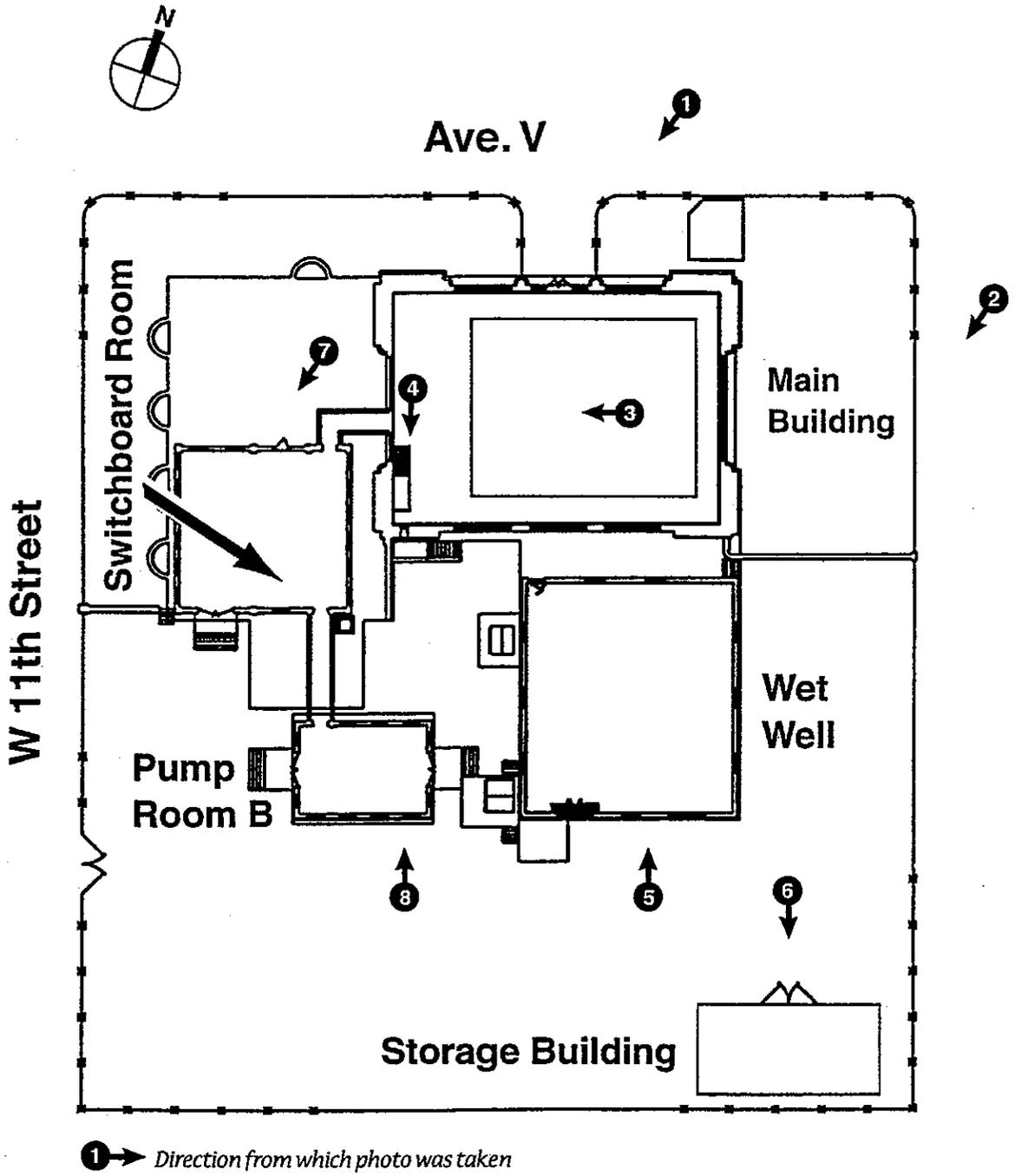
The Topic Intensive Study concluded that both properties identified in the Phase 1A study for the wet weather flow force main warrant further archaeological investigation. The research potential of these properties is described below.

- **A.V.B. Voorhees Property:** The site of the former Willowmere House, located on the A.V.B. Voorhees Property, has a high probability of containing shaft features that could furnish archaeological evidence regarding socioeconomic status and consumer choice issues of the staff and guests of the hotel. Potential shaft features associated with the 19th century occupation of the site as a hotel could lie between 4.5 and 18 feet below the surface. This area of sensitivity is located on Bay 16th Street at the intersection with 17th Court (see Figure 13).
- **A. Young Property:** archeological study may provide comparative data for the study of consumer choices in the more affluent social class of area residents. The property could also provide archaeological data related to changes in household developmental stage. Potential shaft features associated with this residential property could lie between three and 15.5 feet below grade. This area of sensitivity is located approximately midblock on Bay 16th Street between Cropsey and Bath Avenues (see Figure 13).

ARCHITECTURAL RESOURCES

Avenue V Pumping Station Site

The project site is occupied by five buildings built between 1911 and 1962 (see Figure 15). The Main Building (also known as the Dry Well, Pump Room A, and as Building No. 1) and the Wet Well (known as the Grit Chamber and as Building No. 2) are the original two pumping station



buildings on the site. The Switchboard Room (also known as the Guard Shack and as Building No. 3) and Pump Room B (known as Building No. 4) were both built in approximately 1962. The Garage, also known as the Storage Building and as Building No. 5, was built sometime between 1930 and 1950.

The original structures, the Main Building and the Wet Well, were built between 1911 and 1916. They were designed by Albert A. Martin, employed by the Department of Public Works, under the Brooklyn Borough President's office. Martin also designed at least four other pumping stations in a range of styles, of which three—the Gowanus Pumping Station, the Paerdegat Basin Pumping Station, and the Coney Island Pumping Station—still exist.

The Main Building, oriented toward Avenue V, is the architectural and visual centerpiece of the pumping station complex (see Figure 16). It is designed in the Beaux-Arts style, with symmetrical facades and lavish use of terra cotta details. It is faced in brick, and capped by a red roof with three “eyebrow” windows on the north and south facades. The main facade, on the north side of the building, consists of three arched bays flanked on either end of the building by massive brick piers. The center bay forms the entrance from Avenue V, with a pair of doors topped by a pediment. The windows are cast iron with wired glass, and have in recent years been covered with expanded metal cages for security purposes. Between the window bays are engaged terra cotta Doric Roman columns. Above the windows, a terra cotta parapet wall and cornice encircle the building. The rear facade of the building is similar in design, except that there are no doors in the central bay and fewer terra cotta elements. The east and west facades are identical to each other, with a central arched opening flanked by brick piers. The terra cotta on the building appears to be in poor condition, with moisture infiltration having caused spalling and loss of some details. In some areas, repairs have been made with concrete.

The interior of the building consists of a double-height space, which extends below grade and with a ground-level mezzanine open to the lower level (see view 3 of Figure 17). The mezzanine is supported on metal columns with pressed designs, with a decorative metal railing. The walls are covered with glazed tiles in shades of green, red, brown, and brown, including a decorative band at approximately waist level and decorative banding around the windows (see view 4 of Figure 17). The tiles are of a utilitarian nature on the lower level. There are also original copper and bronze elements, such as doorways and railings, and an assortment of original switches, gauges, and meters associated with the original manual operation of the pumping station.

The Wet Well, although built at the same time as the Main Building, is much simpler in design (see view 5 of Figure 18). It is a smaller square structure, faced in the same brick as the Main Building, though absent the architectural detailing and ornament found at the Main Building. Brick arches above the ground-floor openings and brick corbelling at the parapet are the building's only ornament. This building is in near ruinous condition, with part of the roof collapsed. The Wet Well presently obscures most of the Main Building's south façade.

The Garage, tucked in the southeast corner of the site, is a one-story brick structure with a hipped roof (see view 6 of Figure 18). Plainly designed, ornament is confined to brick detailing including a belt course, chimney, and dentil-type cornice below the roof line.

The Switchboard Room and Pump Room B date to the early 1960s when the pumping capacity of the station was increased. The larger of the two structures is the Switchboard Room, which was built over the southern half of the below-grade Crew Quarters, just west of the Main Building, to which it is connected (see view 7 of Figure 19). Pump Room B is a smaller building that houses two pumps (see view 8 of Figure 19). It is located west of the Wet Well and is connected to the Switchboard Room by an enclosed passageway. The two one-story buildings

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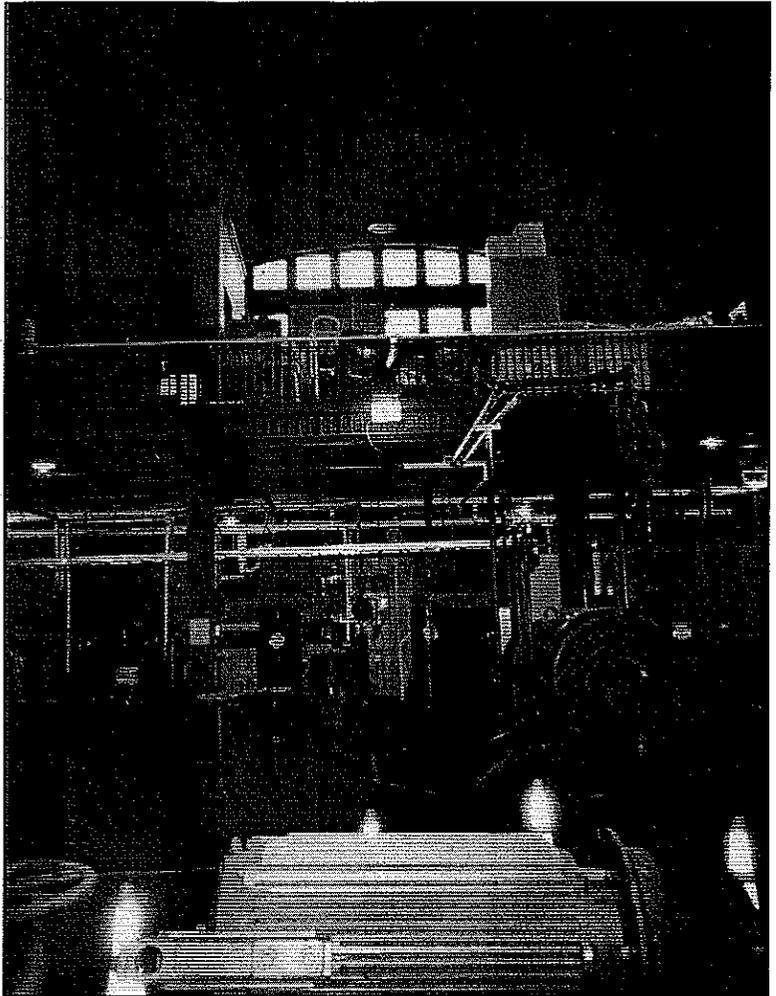


Main Building (Building 1): View looking south from Avenue V 1

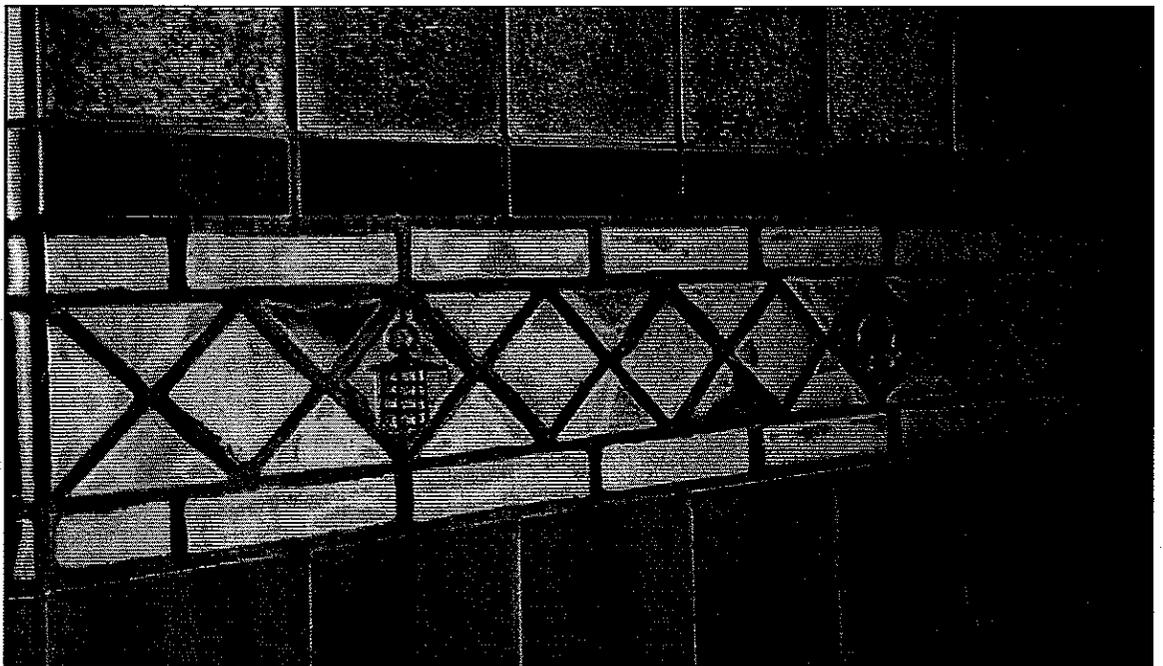


Main Building (Building 1): View looking west 2

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Main Building (Building 1):
Interior and gallery, looking west 3

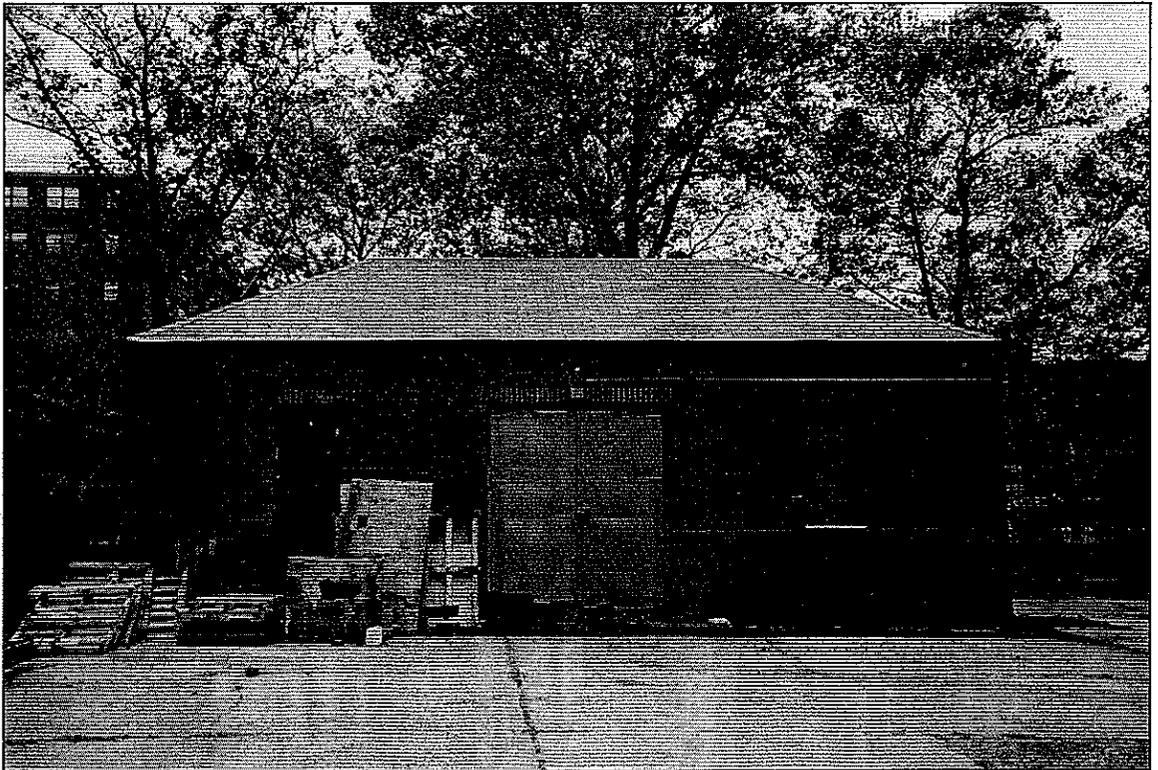


Main Building (Building 1): Interior tilework 4

6.15.05

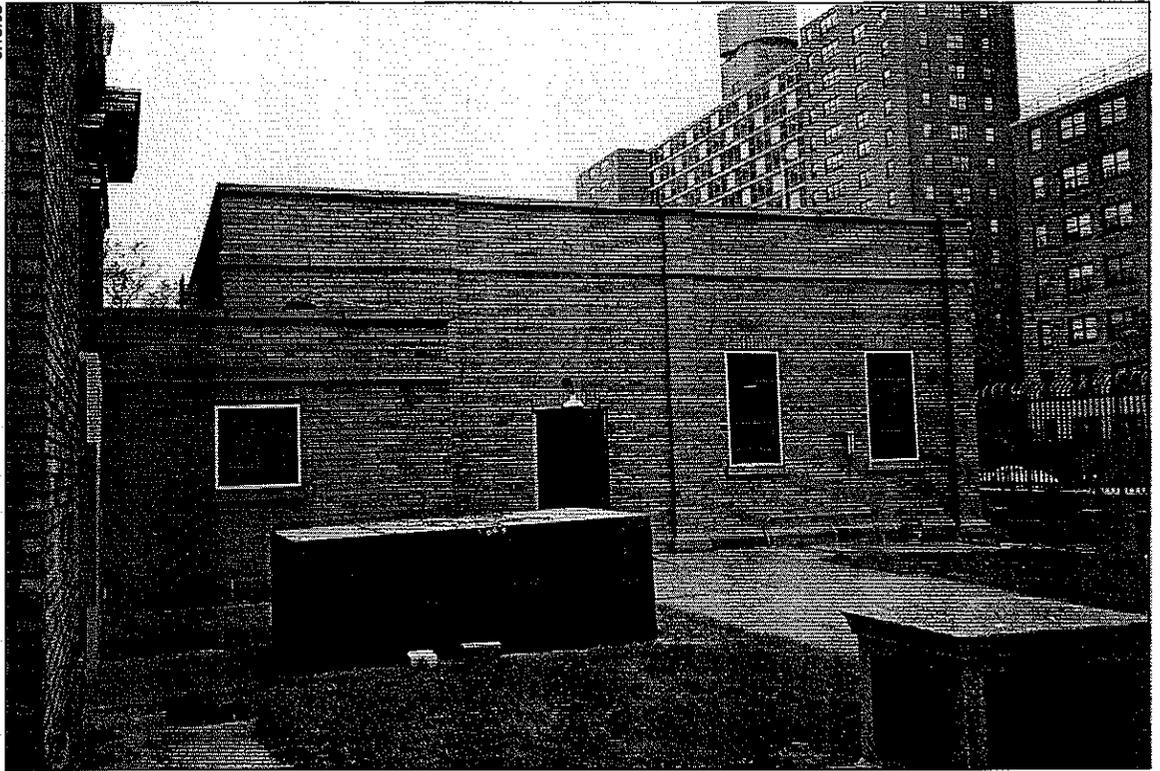


Wet Well (Building 2): View looking south 5



Garage (Storage Building, Building 5) 6

6.15.05



Switchboard Room (Building 3): View looking south 7



Pump Room B (Building 4): View looking north 8

are similar in design. They are plain, brick-clad structures with bluestone sills, coping, and cornice bands.

In June 1998, the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) determined that the Main Building is eligible for listing on the NR.* LPC determined that the Main Building is eligible for New York City Landmark designation in May 1998. OPRHP also determined that the Wet Well appears to contribute to the significance of the pumping station property. OPRHP further concluded that the Main Building appears to retain a high degree of integrity on the exterior and the interior, while the Wet Well appears to be in a deteriorated condition.

The three more recent buildings on the site, the Garage, Switchboard Room, and Pump Room B, are neither architecturally nor historically significant. OPRHP has determined that these structures are not eligible for listing on the NR.

DRY WEATHER FLOW FORCE MAIN

There are no architectural resources located on the project site, e.g., in the roadbeds on Avenue V, 27th Avenue, Cropsey Avenue, Bay 40th Street, or on the shoulder of Shore Parkway.

WET WEATHER FLOW FORCE MAIN

There are no architectural resources located on the project site, e.g., in the roadbeds on Bay 16th Street and Bath Avenue.

STUDY AREA

There are no designated architectural resources within 400 feet of the Avenue V Pumping Station.

There do not appear to be any architectural resources located within 60 feet of the proposed force main routes. However, the Fort Hamilton Officer's Club (Casement Fort) at Whiting Quadrangle in Fort Hamilton is a NYCL and is listed on the S/NR. It is a granite structure built between 1825 and 1831, and is an impressive example of 19th century military architecture. The Casement Fort is located at the northwesternmost corner of Fort Hamilton. As it is located across the westbound on-ramp for the Verrazano-Narrows Bridge from the northern shoulder of Shore Parkway where the force main would be located, it is farther than 60 feet from the proposed force main route, at approximately 350 feet away.

THE FUTURE WITHOUT THE PROPOSED PROJECT

ARCHAEOLOGICAL RESOURCES

In the future without the proposed project, it is expected that no major changes would occur on the project site. Therefore, it is anticipated that there would be no effects to any archaeological resources located on the project site. Potential archaeological resources will remain undisturbed.

* New York State Office of Parks, Recreation and Historic Preservation (OPRHP), *Resources Evaluation, Avenue V Pumping Station*, June 8, 1998 [Note: the date on the Resource Evaluation, 1997, is incorrect (typo), the correct year is 1998]. The resource evaluation is based on information provided to OPRHP in the form of a historic resources assessment memo prepared by AKRF, Inc. on March 12, 1998.

ARCHITECTURAL RESOURCES

In the future without the proposed project, it is expected that no major upgrades or renovation would take place at the Avenue V Pumping Station beyond standard maintenance and operational upkeep.

PROBABLE IMPACTS OF THE PROPOSED PROJECT

ARCHAEOLOGICAL RESOURCES

Avenue V Pumping Station Site

Potential Prehistoric Resources. As described under “Existing Conditions,” the Avenue V Pumping Station site is not sensitive for potential prehistoric resources. Therefore, the proposed project would have no potential for significant adverse impacts on prehistoric archaeological resources on the Avenue V Pumping Station site.

Potential Historic-Period Resources. As described under “Existing Conditions,” the Avenue V Pumping Station site is not sensitive for potential historic-period resources. Therefore, the proposed project would have no potential for significant adverse impacts on historic-period archaeological resources on the Avenue V Pumping Station site.

Dry Weather and Wet Weather Flow Force Mains

Potential Prehistoric Resources. As described above under “Existing Conditions,” the proposed routes of the dry weather and wet weather flow force mains are not sensitive for potential prehistoric resources. Consequently, the proposed project would have no potential for significant adverse impacts on prehistoric archaeological resources in the proposed routes of the dry weather and wet weather flow force mains.

Potential Historic-Period Resources. As described under “Existing Conditions,” twelve areas of potential historic-period sensitivity have been identified on the project sites for the dry weather and wet weather flow force mains. Ten areas of potential historic-period archaeological sensitivity have been identified on the project site for the dry weather flow force main. These include a historic wharf, a churchyard in use since 1869 and eight home lots dating from the second half of the 19th century. Two areas of potential historic-period archaeological sensitivity have been identified on Bay 16th Street in the path of the proposed wet weather flow force main. These consist of the potential archaeological resources associated with the A.V.B Voorhees property (which became the site of the Willomere Hotel) and the A. Young property.

Based on current engineering plans which propose trenching (open cut construction) and microtunneling, ten of the twelve potentially sensitive areas could be impacted by proposed force main installation. Microtunneling at a depth of +/- 15 feet on the inland streets and associated tunnel shafts of approximately 20 feet in depth and 10 feet in width for a single force main (and 20 feet by 20 feet for two force mains) that would be placed at the intersections could disturb five of the 12 potential historic-period resources:

- Robert Euin Property (see Figure 11): located on Cropsey Avenue south of 26th Avenue, proposed microtunneling at a depth of 15 feet below the surface could adversely impact potential residential shaft features that could lie between three and 18.5 feet below the surface.
- B. McGetrick Property (see Figure 11): located on Cropsey Avenue at the intersection of 26th Avenue, proposed microtunneling at a depth of 15 feet below the surface could

adversely impact potential residential shaft features that could lie between three and 18.5 feet below the surface.

- James McBride Property (see Figure 11): located on Cropsey Avenue north of 26th Avenue, proposed microtunneling commencing at a depth of 15 feet below the surface could adversely impact potential residential shaft features that could lie between three and 18.5 feet below the surface.
- A.V.B. Voorhees Property (see Figure 13): located on Bay 16th Street at the intersection of 17th Court, shaft features estimated at a depth of 4.5 to 18.5 feet below the surface associated with the former Willomere House (located on the A.V.B. Voorhees property) could be impacted by microtunneling at a depth of 14 feet below the surface.
- A.Young Property (see Figure 13): located on Bay 16th Street approximately midblock between Cropsey and Bath Avenues, microtunneling at a depth of 12 to 13 feet below the surface could adversely impact potential residential shaft features that could lie between three and 15.5 feet below the surface.

Cut and cover construction to install the force mains on the shoulder of the Shore Parkway at depths ranging up to 15 feet below the surface could impact an additional five properties identified as archaeologically sensitive (see Figure 12). These potentially sensitive areas, located from just south of Bay 38th Street to 24th Avenue, could contain residential shaft features located between three and 12 feet below the surface:

- Mrs. Remsen Property
- John Bateman Property
- Mrs. William Bateman Property
- John B. Denyse Property
- Stephen Morris Property

The potential site of Denyses Wharf would not be impacted by proposed project construction. As shown on Figure 14, this potentially sensitive area is located approximately in the roadbed of the entrance to Fort Hamilton, in the location of an existing sewer to which the new dry weather flow force main would be connected. The proposed new force main would be installed approximately 40 feet south of this potentially sensitive area, not disturbing this area of sensitivity.

The site of the former African Methodist Episcopal Zion Church of Gravesend would not be impacted. Potential burials, which could lie in the roadbed of 27th Avenue at a point approximately midblock between Harway and Bath Avenues (see Figure 10) at a depth of two to 15 feet below the surface would remain unaffected by microtunneling, which is proposed commencing at a depth of 22 feet below grade. The 22 foot depth for microtunneling at this location is deeper than the 15 foot depth along other route segments. This greater depth for microtunneling was designed by NYCDEP in order to avoid impacting potential burial sites. However, should project plans change and it is determined that microtunneling is not feasible at this location, NYCDEP may choose an alternative route (which would be subject to environmental review.) If neither microtunneling nor re-routing would be possible, the following alternative procedures would be followed due to the sensitivity of encountering human remains to ensure that no potential significant adverse impacts on historic resources would occur:

To avoid disturbing any potential burials that may be associated with the African Methodist Episcopal Church, it is recommended that a 15 feet buffer be created around the known church lot lines. Within this boundary, testing would be undertaken prior to construction by professional archaeologists, including a forensic archaeologist/physical anthropologist, to determine whether burials may be present following a protocol to be developed and approved by LPC and SHPO prior to testing. It is further recommended that monitoring during construction by a forensic archaeologist be undertaken to ensure that no potential significant adverse impacts on historic resources would occur. In consultation with LPC and SHPO, the project team would consult with the descendent church community prior to any subsurface testing or construction regarding the appropriate protocol for handling human remains, should any be encountered.

Stage 1B testing in advance of construction for the presence of archaeological resources relating to the ten sensitive sites on the project sites for the dry weather and wet weather flow force mains (and that would be impacted by project construction) is not recommended for the project due to the expected depth of the potential archaeological resources. Performing shovel (test) pits through deep fill layers and to depths estimated of up to 18.5 feet below the surface, to reach the potentially archaeologically sensitive areas, would be extremely difficult. In addition, testing would require the protracted closing of several residential streets. Therefore, it is recommended that an archaeologist monitor the ten sensitive areas during the excavation for the dry weather and wet weather flow force mains. Since installation of the force mains along the Shore Parkway would be accomplished through cut-and-cover excavation, the archaeologists would have the opportunity to monitor the removal of soils and identify and investigate any archaeological features if encountered in the five areas identified to possess archaeological sensitivity (see Figure 12). While installation of the force mains via microtunneling on the inland streets would involve the excavation of tunnel shafts at intersections, it is not fully clear at this time at which intersections these shafts may be constructed. Since microtunneling would not provide archaeologists the opportunity to monitor the removal of soils and it is possible that microtunneling on Cropsey Avenue and Bay 16th Street could occur through potentially sensitive strata (see Figures 11 and 13), to avoid potential adverse impacts, NYCDEP is committed to sinking shafts for the installation of the force mains in the areas of sensitivity so as to allow the archaeologists to monitor the removal of soils in these locations. The specific locations are as follows:

- Cropsey Avenue at 26th Avenue and just north and south of 26th Avenue: these locations are sensitive for residential shaft features associated with the Robert Euin, B. McGetrick, and James McBride properties (see Figure 11).
- Bay 16th Street at 17th Court: this location is sensitive for shaft features associated with the Willomere Hotel on the A.V.B. Voorhees property (see Figure 13).
- Bay 16th Street midway between Cropsey and Bath Avenues: this location is sensitive for residential shaft features associated with the A. Young property (see Figure 13).

A monitoring plan has been prepared following LPC's *Guidelines for Archaeological Work in New York City* (2002) and includes clear protocols for the professional archaeologist to monitor excavation activities in the archaeologically sensitive areas, including providing for the commencement and stoppage of work and for potential archaeological data recovery (removal of remains). This protocol will be submitted to OPRHP and LPC for review and is available at NYCDEP. The stipulations of the monitoring plan will be agreed upon by the archaeologist, NYCDEP, the contractor, and with approval by LPC and OPRHP prior to project construction.

For construction of both the dry weather and wet weather force mains, HPI has also developed an Unanticipated Discovery Plan in the event that any human remains or non-human cultural materials are encountered during project construction. This plan will also be submitted to ORPHP and LPC for review and is available at NYCDEP. It provides for the procedures to be undertaken in the event of an unanticipated discovery, including the provision for stopping work, evaluating the significance of a find, disinterment of human remains if encountered, and notification procedures.

To avoid adverse impacts on potential archaeological resources, NYCDEP will continue to consult with OPRHP and LPC, as appropriate, as project engineering proceeds and construction commences.

ARCHITECTURAL RESOURCES

Avenue V Pumping Station Site

The proposed project would involve the demolition of four of the five buildings on the site: the Wet Well, Switchboard Room, Pump Room B, and the Garage. The Main Building would be retained on the site but modified. Three new structures, a new Wet Well, a Generator Building, and a Network Protection Structure (NPS) would be built on the site. The Wet Well would be built fully underground and would replace the existing Wet Well structure. The Generator Building would be erected on the site at the location of the former Garage at the southeast corner of the site. The NPS would be built at the southwest corner of the site.

In February 2000, materials detailing the proposed project, including the proposed demolition of the four buildings on the site, construction of the Generator Building, restoration of the Main Building, and interior modifications to the Main Building, were provided to SHPO. On September 15, 2000, SHPO determined that the proposed project would have no adverse impacts on historic resources provided several conditions pertaining to the restoration of the façade were incorporated into the project. In comments dated September 25, 2000, LPC concurred with OPRHP's findings.

Main Building. The upgrading of the Main Building would involve the restoration of the exterior, the removal of all existing main sewage pumping equipment and installation of new sewage equipment, and alterations to the ground-floor mezzanine.

Exterior repairs would consist of repointing, replacement of deteriorated terra cotta, roofing, and coping materials, new window glazing and removal of the window security cages, and repair of cast-iron window frames. Work would be performed based on conditions outlined in ORPHP comments dated September 15, 2000 and described below, and the requirements of the Art Commission of New York City. This work would be carried out under the supervision of a licensed and professional restoration architect who has been retained by the project to guide the restoration.

- Repointing would only be undertaken in areas where the mortar is deteriorated. The deteriorated mortar, if it is powdery or sandy, would be removed using hand-held, non-power tools. Power tools would only be used if the mortar is of a hard variety, if it has cracked, or if it has separated from the masonry units. If power tools are used, they would be for the purpose of creating a "kerf" in the middle of the joint to relieve pressure, so that the masonry could then be removed by hand. Caution would be used if masonry saws are utilized, and they would not be used to completely remove existing mortar, as this tool has the potential to erode or cut the masonry units.

- Deteriorated terra cotta, including on the facade and the roof, would be removed and replaced in kind. In addition, terra cotta of a condition that would allow for its retention would be retained where feasible. The project team has consulted with a terra cotta expert regarding determining the color of the terra cotta and will ensure that replacement terra cotta matches the existing terra cotta.
- Replacement of the single pane wired glass with polycarbonate vandal-resistant glazing would be done in such a fashion as to not significantly alter the window profiles or the reflective quality of the windows. The expanded metal window security cages, a later addition to the building, would be removed.

Repointing and terra cotta replacement would overall improve the historic building's structure and appearance, which are in some locations somewhat deteriorated, while retaining the building's integrity. The removal of the window security cages would remove an historic feature of the building that currently detracts from the building's appearance. Since the proposed exterior work would be performed in the manner detailed by OPRHP and with which LPC has concurred, the proposed project would not have any adverse effect on the exterior of the Main Building. In addition, the restoration of the Main Building would include the restoration and rebuilding of the curved walls that projected from the building to the east and west. One of these walls, at the rear of the site, which is in a deteriorated condition, would be removed during project construction and rebuilt to its original appearance following completion of the rehabilitation of the Main Building. The matching wall, which extended west from the Main Building but which was demolished during the construction of the Switchboard Room, would be rebuilt to its original appearance. To accomplish this, brick salvaged from the demolition of the Wet Well (discussed below) would be utilized and matching terra cotta used.

The proposed conversion of the pumping station from a staffed to a non-staffed facility would also require a number of changes to the interior. These include the extension of an existing mezzanine, removal of original equipment to accommodate new equipment, and cleaning of the interior. OPRHP has indicated that this work would have no adverse impacts on historic resources.

The ground floor mezzanine would be extended in the southernmost portion of the building, and would be erected as a concrete slab supported on steel columns. The columns would be wrapped in cast iron to match the existing mezzanine support columns. The portion of the mezzanine fascia and railing components in the area of the proposed extension would be salvaged and reused on the new mezzanine extension to match the profile and appearance of the original mezzanine.

Defunct mechanical equipment would be removed to make way for new equipment that would allow the pumping station to become a non-staffed facility. NYCDEP has committed to keeping and storing selected elements. Removal of original equipment to bring the facility up to date, and allow the structure to still function in its original capacity as a pumping station instead of it being abandoned, would not constitute an adverse effect.

Subsequent structural and architectural analyses performed at the Main Building have necessitated that additional work be undertaken. An analysis performed of the Main Building's capacity to resist lateral forces due to a seismic event indicated that the present structure does not meet required criteria as stipulated by the New York City Seismic Code. To strengthen the facility, the building structure would be enhanced by a new ring of concrete columns that would

meet the International Code Council's Building Code (IBC).^{*} The columns would be placed within the walls of the existing structure at its corners and at intervals along the facades. The new columns would not be visible on the exterior of the building and in most cases would not be visible from within the interior.

In addition, it has been determined that the interior tile work is in poor condition and in most cases no longer securely affixed. The proposed project would retain the decorative tile work (glazed tiles) except in locations where its removal would be required for installation of new equipment and conduits and where it is in poor condition or unstable. Where original material needs to be removed but is in a condition that it may be reused, it would be reattached. Where the tiles cannot be salvaged they will be replaced in kind.

Other changes that would be made include the conversion of the existing below-grade Work Shop to a mechanical equipment room. The existing lockers, showers, laundry, and kitchen, associated with the pumping station's original manned capacity, would be removed, although the bathroom would be retained and renovated with new fixtures and piping. The bathroom on the ground floor would also be restored.

Overall, although numerous changes would be made, the major interior spaces of the Main Building would be retained and none of the proposed alterations would adversely affect the historic character of the building. The proposed restoration of the exterior of the main Building would have a positive effect on this historic resource. Alterations to modernize the interior would allow the structure to continue to fulfill its function as a pumping station while meeting applicable codes and the city's needs.

To avoid adverse impacts on the Main Building, NYCDEP will continue to consult with OPRHP, as appropriate, as project engineering proceeds and construction commences.

Wet Well. As detailed above, OPRHP determined in 1998 that the Wet Well appears to contribute to the significance of the pumping station property. However, OPRHP also noted that the structure is in a deteriorated condition. The structure has lost much of its roof integrity and its interior has been severely damaged. The structure is not architecturally significant by itself. Its significance lies in its association with the development of the pumping station, since it was built at the same time as the Main Building and designed by the same architect. However, the structure has lost its integrity. Its demolition would alter the context of the pumping station complex by removing one of the original structures. However, this context has changed over time with the construction of new buildings on the site which have been built in close proximity to the Main Building. Therefore, as indicated in OPRHP's September 2000 comments, its demolition would not result in adverse impacts to historic resources.

A new Wet Well would be built south of the Main Building, requiring the demolition of the existing Wet Well structure. It would be below grade and, therefore, not visible. The extension would be built on a concrete slab supported by piles. It would be at a lower elevation than the existing Wet Well floor, to provide better drainage of the surrounding contributing sewers. The construction of the new Wet Well would not require modifications to the Main Building, since access to the new Wet Well would be via hatches in the new structure's roof at ground level. New sewage pumps would be installed in the new Wet Well.

^{*} While the IBC has not yet adopted by the New York City Department of Building's Commissioner it has been adopted by New York State and is more stringent than the New York City Seismic Code.

Other Buildings on the Site. As described above, none of the other structures on the site built after the construction of the two original buildings—the Switchboard Room, Pump Room B, and the Garage—have been determined eligible for listing on the S/NR.

Construction of the new Generator Building, to house the pumping facility’s fixed emergency power generation equipment, would not be expected to adversely affect the Main Building since it would be located in roughly the same area as the Garage and would be of a comparable size. The architectural treatment of the new building would be designed to complement the Main Building but not overpower it. The new NPS structure would also be built at a distance from the Main Building, and would be a small structure. Similar to the Generator Building, it would be designed to complement the Main Building in architectural style and materials.

Force Mains

Dry Weather Flow Force Main Route. As described above, there are no historic resources located on the site of the proposed new force main.

Wet Weather Flow Force Main Route. As described above, there are no historic resources located on the site of the proposed new force main.

Study Area

There are no designated architectural resources within 400 feet of the Avenue V Pumping Station site.

As detailed above under “Existing Conditions,” there do not appear to be any architectural resources located within 60 feet of the proposed force main routes. Based on figures prepared by the American Society of Civil Engineers, the distance for potential damage to designated historic and eligible structures due to pavement breaking operations is 60 feet (see Table H-1). The closest resource, the Casement Fort, located across the westbound on-ramp for the Verrazano-Narrows Bridge from the northern shoulder of Shore Parkway where the dry weather flow force main would be located, is approximately 350 feet from the proposed construction.

**Table H-1
Vibration-Induced Risk Criteria for Buildings**

Activity	Perceptible Distance (feet)	Damage Potential Distance (feet)		
		Architectural		Structural
		Historic	Residential	
Pavement Breaking	150	60	40	8
Bulldozing	60	30	20	3
Heavy Truck Traffic	50	20	15	3
Jackhammers	30	15	10	2
Sources: Wiss, John F. Construction Vibrations: State-of-the-Art. Journal of the Geotechnical Engineering Division, Proceedings of the American Society of Civil Engineering Division, Proceedings of the American Society of Civil Engineers, Volume 107, No. GT2, February, 1981. Standard Recommended Practice for Evaluation of Transportation Related Earthborne Vibrations. ASSHTO Designation: R8-81(1986).				

I. URBAN DESIGN/VISUAL RESOURCES

The Main Building is the architectural and visual centerpiece of the pumping station complex. The building is in a classical Beaux-Arts style, with symmetrical facades and lavish use of terra cotta details. Under the proposed project, the Main Building would be rehabilitated and restored in a manner consistent with the architectural detail of the existing building. The Main Building would be renovated, as discussed above in Section H, “Historic and Archaeological Resources” and would retain its architectural details. By retaining and renovating this structure, the key urban design and visual resource elements of the site would be maintained.

The proposed project would not result in buildings substantially different in height, bulk, form, setbacks, size, scale, use or arrangement than currently exists. Streetscape elements—including block form, street hierarchy, streetwall, curb cuts, and pedestrian activity—would not be significantly affected. The proposed project would not result in new above-ground development, nor would it change the bulk of new above-ground development. The proposed project would be consistent with the existing urban design and visual resources of the surrounding area, and no significant adverse urban design/visual resources impacts are expected to result from the project.

J. NEIGHBORHOOD CHARACTER

The proposed project would not affect the context and feeling of the existing neighborhood. The surrounding neighborhoods are primarily apartment buildings and attached residences. Local commercial uses are found along the main avenues. The proposed project would maintain the existing use at the pumping station site; the central urban design and visual resource elements of the site would be maintained with the retention and rehabilitation of the Main Building; historic resources would not be significantly affected; socioeconomic conditions would not be significantly impacted by direct or indirect changes to population, housing stock, or economic activities; the amount of traffic and the type of vehicles would not be significantly changed; and ambient noise quality will not be significantly impacted.

Overall, no significant adverse effects to neighborhood character would result from the proposed actions.

K. NATURAL RESOURCES

No natural resources are found on the site of the Avenue V Pumping Station and those portions of the force main routes that are located under paved New York City streets. Trees, shrubs, and other vegetation used by animals for nesting and foraging are found along the shoulder of Shore Parkway, where a portion of the force main would be buried. Information on the natural resources of the proposed force main route was gathered through field surveys and a review of the literature of similar habitat types. As part of the design effort, a landscape architect mapped all trees along the route of the proposed force mains. The grassy shoulder on the north side of the Shore Parkway exhibits typical roadside vegetation, some of which is naturally occurring invasive weed and grass species as well as remnant upland and ornamental trees.

Along the residential extent of the proposed pipe route (i.e., 27th and Cropsey Avenues), street trees are the only vegetation near the road, primarily consisting of London planetree (*Platanus x acerifolia*) and oaks (*Quercus spp.*). The trees located along the sidewalk would be undisturbed, and no significant impacts on these resources are expected.

Most of the approximately 20- to 50-foot-wide highway shoulder is dominated by mowed roadside grasses (*Gramineae spp.*) interspersed with shrubs, young eastern red cedar (*Juniperus*

virginiana), and short, scrubby pine trees (pitch pine, *Pinus rigida*, or similar non-native pine). A chain-link fence separates the grassed highway roadside from residential streets to the north along most of the proposed route. This fence is bordered by privet (*Ligustrum vulgare*) up to 12 feet high and occasional clusters of young tree-of-heaven (*Ailanthus*) saplings. Remnant, mature black oak (*Quercus velutina*) and London planetree along the fence likely predate the construction of the Shore Parkway. Other woody species observed less frequently include honey locust (*Gleditsia triacanthos*), both saplings and mature trees; pin cherry (*Prunus pensylvanica*); smooth sumac (*Rhus glabra*); and pussy willow (*Salix discolor*).

Areas that do not experience frequent mowing exhibit a more diverse herbaceous and woody cover. Late goldenrod (*Solidago gigantea*), dandelion (*Taraxacum officinale*), common plantain (*Plantago major*), field garlic (*Allium vineale*), ragweed (*Ambrosia artemisiifolia*), clover (*Trifolium spp.*), and various invasive vines or trailing plants—including greenbriar (*Smilax rotundifolia*), sweetbriar (*Rosa eglanteria*), and Japanese honeysuckle (*Lonicera japonica*)—were noted along the borders of mowed areas and in the understory of the few more heavily vegetated areas along the fence line. In the vicinity of Fort Hamilton, an expanse of unmowed field exhibited orchard grass (*Dactylis glomerata*), redbtop (*Agrostis alba*), and crabgrass (*Digitaria sanguinalis*).

Certain portions of the force main route exhibited somewhat different plant constituents. These include the very narrow strip, approximately 6–10 feet wide, along the border of the highway and Fort Hamilton. Little other than mowed grass is present here. Just east of the Verrazano-Narrows Bridge, a long row of forsythia was present and not seen elsewhere. Lastly, the strip along the highway—west of the bridge and separating it from the park to the north—was too narrow to walk safely through. Privet (*Ligustrum vulgare*); oak, most likely scarlet oak (*Quercus coccinea*); and London planetree (*Platanus x acerifolia*) predominated here.

The shoulder adjacent to the Shore Parkway exhibits little unique or sensitive vegetation. All species are tolerant of disturbance and environmental stress, as indicated by their presence along the parkway. Installation of the proposed force main would not result in permanent alteration of the vegetative composition.

As part of the design effort, a landscape architect conducted a tree survey in the affected areas of the proposed project. Along the shoulder of Shore Parkway, a total of 774 trees and shrubs were surveyed and mapped. Of this total, about 23 percent are within the construction area. Trees and shrubs that would be affected by construction of the force main along the route of Shore Parkway have been slated to be either transplanted, removed, or protected. Of the roughly 180 trees and shrubs that would be impacted by the construction, about 76 would be protected and 30 would be transplanted. Sixty nine trees would have to be removed. This is a loss of about 39 percent of the trees in the direct construction area and about nine percent of the total number of trees along the construction corridor.

All trees that would be protected are considered healthy and viable. Additionally, they are located in areas outside of the construction zones. Trees marked for protection include the following species: Norway maple (*Acer platanoides*), London planetree (*Platanus x acerifolia*), rose of Sharon (*Hibiscus syriacus*), white mulberry (*Morus alba*), black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*), oak species (*Quercus phellos*, *Quercus palustris*, *Quercus rubra*, *Quercus coccinea*), hawthorn (*Crataegus crusgalli*), black locust (*Robinia pseudoacacia*), American elm (*Ulmus Americana*), honeylocust (*Gleditsia triacanthos*), crabapple (*Malus CV*), hackberry (*Celtis occidentalis*), and Ginkgo (*gingko biloba*).

Trees and shrubs that would be removed are located directly within the construction zone. They were determined to be dead, unhealthy, or too large for successful transplanting. The removed species would include: White mulberry, rose of Sharon, tree of Heaven (*Ailanthus altissima*), oaks, Black locust (*Robinia pseudoacacia*), Austrian pine (*Pinus nigra*), crabapple, Hedge maple (*Acer campestre*), Japanese black pine (*Pinus thunbergii*), American elm (*Ulmus americana*), redcedar (*Juniperus virginiana*), and Black cherry.

Whenever possible, trees and shrubs located within the construction zone would be transplanted if they are considered healthy and small enough for transplanting. Species that would be transplanted include: oaks, hedge maple, Allegheny serviceberry (*Amelanchier laevis*), pines, and red cedar.

All the trees scheduled for transplanting would be dug at the appropriate time for that particular species. For example, oak trees will tend to transplant better if done in the early spring rather than the fall. Also, as a precaution, all transplants shall be over-dug to ensure that a sufficient root system comes with them. Only damaged or dead wood would be removed prior to transplanting. Prior to any construction activities along a segment of the force main construction route along Shore Parkway (such as clearing or excavation), tree protection fencing would be installed. A minimum of six-foot-tall fencing would be installed at a distance of five feet past the dripline of the trees to provide protection. Signs would be attached to the fence stating that inside the fencing is a tree protection zone, which is not to be disturbed unless prior approval has been obtained from the NYCDEP. No application of chemicals, trenching, grading, root/branch pruning, or other activity would occur within the tree protection zone without the supervision of an on-site arborist and approved by NYCDEP. The fencing would not be removed until all construction activities are completed. The tree protection fence line would be used in conjunction with silt fences and hay bales outside the fence to prevent damage from erosion or the transport of construction materials.

NYCDEP will continue to work with the New York City Department of Parks and Recreation to reach an agreement on a tree replacement planting plan will be developed and implemented as part of the construction documents for the project. For at least 2 years after construction, a weekly watering schedule during the growing season (April to October) will be included as part of the transplant plan.

With the proposed replacements of trees and the development of a construction plan that minimizes potential adverse impacts on natural resources, no significant adverse impacts on natural resources are expected.

L. WATER QUALITY

INTRODUCTION

This section evaluates the water quality improvements anticipated from abatement of CSO discharges into Coney Island Creek. The potential impacts from relocating CSO to the Verrazano Narrows and surrounding waters are also addressed.

The 1998 *Final Facilities Planning Report for the Coney Island CSO Facility Planning Project*, prepared by Hazen and Sawyer and HydroQual, Inc. for NYCDEP as part of the Phase II City-Wide CSO study, identified and quantified existing water quality issues, at that time, in Coney Island Creek.

EXISTING CONDITIONS

Coney Island Creek is approximately 1.6 miles long. At its head end, Coney Island Creek is a narrow, shallow body of water approximately 50 yards wide and flows in a southwesterly direction. During periods of low tide, the head of the creek becomes an exposed mudflat. Approximately 1,500 feet from the head, the creek turns and flows in a northwest direction. Its width remains narrow while its depth increases slightly to 2-4 feet Mean Low Water (MLW). There is another bend in the creek beyond Stillwell Avenue. The creek begins to widen past Cropsey Avenue and the depth increases to approximately 7-8 feet MLW. At West 19th Street the creek takes a final turn and flows west by northwest. Here, the width increases to 500 yards and the depth increases to 13-14 feet MLW. The widest portion of Coney Island Creek occurs off the cement fishing pier in Kaiser Park where the creek is 1,100 yards wide. A large tidal mudflat lies on the north shore of the creek in Drier-Offerman Park. The mouth of the creek narrows beyond the fishing pier as a considerable amount of beach sand has accumulated along the south shore. The width of the creek here is 700 yards. Coney Island Creek empties into Gravesend Bay and depths here range from 14-26 feet MLW.

The lower portion of Coney Island Creek from the mouth to Cropsey Avenue is lined with numerous obstructions including wrecks, old barges, pilings, and construction debris. Upstream of the Cropsey Avenue bridge the creek becomes choked with abandoned cars and boats, pilings, and other urban refuse. Boat passage near the head of the creek is difficult except during periods of high tide.

Drainage Area

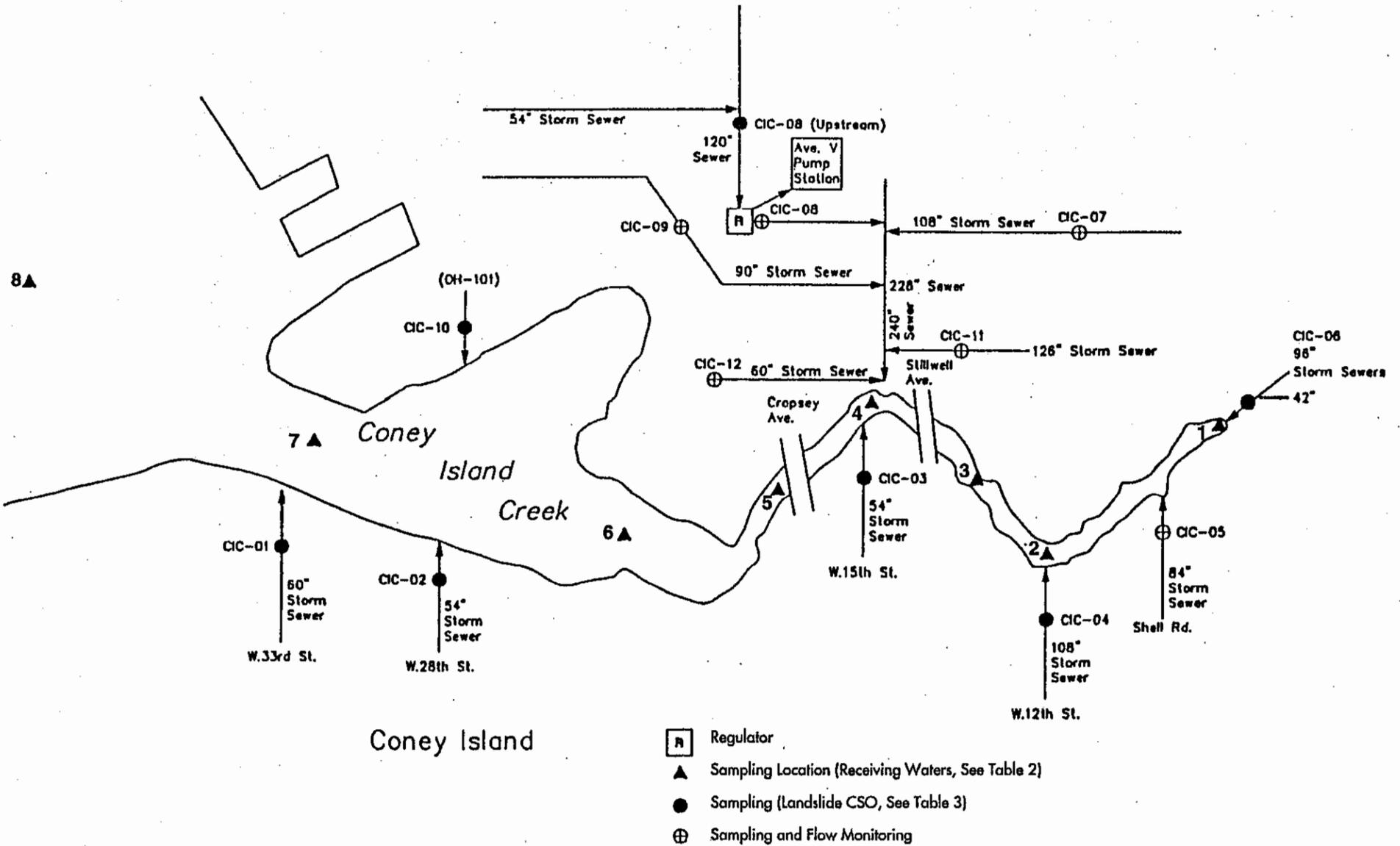
The Coney Island Creek drainage basin is defined by the topographic conditions in southwestern Brooklyn and by engineered sanitary and stormwater drainage systems. The total drainage area tributary to Coney Island Creek is approximately 4,700 acres. The drainage system for the creek study area is divided into three major sub-areas: a combined sanitary and stormwater sewer collection area draining to the Avenue V Pumping Station and Coney Island Creek (850 acres), a separate sanitary sewer area tributary to the Avenue V Pumping Station (2,050 acres), and a separate sanitary sewer area tributary to the Coney Island WPCP (1,800 acres).

Eight stormwater sewer lines discharge directly to Coney Island Creek. Figure 20 shows the sizes and locations of these stormwater lines. The 240-inch stormwater line located between Cropsey and Stillwell Avenues is a CSO line, which includes the outfall from the Avenue V Pumping Station.

Water Quality Summary

The waters of Coney Island Creek are classified "I" by NYSDEC. The NYSDEC classifications were established to determine the best usage of a water body based on concentrations of parameters such as dissolved oxygen and coliform bacteria.

Results of the 1998 Coney Island Creek water quality monitoring program indicated that CSOs, stormwater discharges, and dry weather sanitary flows had a detrimental effect on the creek's water quality. NYSDEC standards for the water quality indicators dissolved oxygen (DO) and coliform bacteria were consistently violated under both dry and wet weather conditions in the middle and upper portions of the creek (DO is the amount of dissolved oxygen in the water column, one of the most universal indicators of water quality in aquatic systems, while coliform bacteria inhabit the intestines of humans as well as other warm-blooded animals and are thus commonly used as indicators of unsanitary water conditions). The impacts were limited to the



Graphics provided by Hazen and Sawyer

**AVENUE V
PUMPING
STATION**

Coney Island Creek CSO Sampling Sites

Figure 20

creek itself and did not appear to affect the water quality of Gravesend Bay or Lower New York Harbor.

Due to the large amount of nutrient loading to Coney Island Creek from historical dry weather overflows (DWOs) and CSOs, photosynthesis caused large fluctuations of in the DO content. Photosynthesis is the production of organic material with nutrients and light energy by either rooted aquatic plants or free-floating, unicellular plants called phytoplankton. Oxygen is a byproduct of the photosynthetic process; when excessive amounts of phytoplankton are present in the water column (e.g., bloom conditions), DO levels may become supersaturated. The respiration of phytoplankton during dark periods, however, consumes oxygen for the oxidation of organic compounds to provide energy for metabolic needs. Under bloom conditions, phytoplankton respiration can produce hypoxic conditions, which can severely stress or kill aquatic organisms. Thus, when phytoplankton blooms exist, large diurnal fluctuations in DO concentrations can occur.

1998 water quality modeling performed to simulate conditions in Coney Island Creek at that time showed that on an average basis, in the upstream end of the creek, the DWOs had the largest impact on oxygen concentrations. Both the background sinks (boundary effects and background sediment oxygen demand) and the storm-related loads (from stormwater and combined sewer outfalls) contribute to the oxygen deficit to a lesser degree. Modeling showed that the largest contributor of total coliform bacteria is DWO. The modeling showed that with DWO the geometric mean value was in violation of the state standard, although with the DWO removed the geometric mean value would be in compliance with the standard. Independent of the proposed project, NYCDEP has implemented measures to eliminate dry weather sanitary overflows (DWOs) to Coney Island Creek.

FUTURE WITHOUT PROPOSED PROJECT

While the elimination of the DWOs into Coney Island Creek will improve the water quality in Coney Island Creek in the future without the proposed project, it will not be sufficient to bring the water quality up to meet all NYSDEC standards. Improvements to water quality, especially in DO levels and total and fecal coliform counts, are expected as a result of the elimination of the DWOs.

Nutrient loading is also expected to decrease with DWOs eliminated from the creek. Elimination of the sources of nitrogen, coliform, and biochemical oxygen demand (BOD) will reduce the impact of algal blooms on DO levels. However, the extent to which DO levels will improve is not known due to uncertainty with respect to algal response to reductions in nutrient levels and lowered BOD in the creek.

Gravesend Bay and the Outer Harbor area would be expected to continue to meet water quality standards. Upgrades to the WPCPs and other actions by NYCDEP are expected to contribute to better water quality throughout New York Harbor. However, reduction in CSO flows to Coney Island Creek would not occur, and the CSO discharges into Coney Island Creek would not comply with the U.S. Environmental Protection Agency's (EPA) Final CSO Policy

FUTURE WITH THE PROPOSED PROJECT

CONEY ISLAND CREEK WATER QUALITY

Reduction of CSO flows into Coney Island Creek resulting from the proposed improvements to and increased capacity of the Avenue V Pumping Station is expected to further improve water quality conditions beyond the expected improvement from elimination of DWOs. The proposed

improvements would result in a 40 percent reduction of CSO volume and a 90 percent reduction of pollutant loadings to the creek from current CSO conditions. The 80 mgd of re-conveyed flow out of Coney Island Creek with the proposed project represents 85 percent of the CSO flow into Coney Island Creek. By taking 85 percent of the CSO flow out of Coney Island Creek, the project would meet EPA's presumptive approach for satisfying combined sewer discharge reductions.

VERRAZANO NARROWS WATER QUALITY

The proposed project would increase the wet weather capacity of the Avenue V Pumping Station to 80 mgd. During dry weather, flows would be conveyed through one force main to an interceptor sewer leading to Owls Head Water Pollution Control Plant. During wet weather, flows would be conveyed via two force mains to a series of interceptor sewers and regulators. The additional flow is expected to result in additional CSO overflow from the regulators to one of the outfalls in the vicinity of the Verrazano Narrows.

Dissolved Oxygen

The *Outer Harbor CSO Facility Planning Project Final Facilities Planning Report, December 1994* (Outer Harbor CSO Study) reported that the water quality at the Narrows meets standards. The Outer Harbor CSO Study also utilized a three-dimensional hydrodynamic model and a water quality model to quantify the impact of pollutants introduced by combined sewer and stormwater runoffs to the Outer Harbor. The hydrodynamic model defined circulation patterns in the study area while the water quality model evaluated the distribution and fate of pollutants and their impact on water quality in receiving waters. In order to assess the impact of Outer Harbor CSOs on dissolved oxygen, a water quality simulation was performed with all Outer Harbor CSO contributions removed from the model. The results of this analysis indicated the contribution of Outer Harbor CSOs are small compared to other CSO loadings, and the computational results of dissolved oxygen improvement without Harbor CSOs is less than 0.1 mg/l. Therefore, the redirection of CSO under this proposed project, which only reflect a small percentage of all Outer Harbor CSOs, would not create significant adverse impacts on dissolved oxygen levels.

Heavy Metals

The CSO discharge would contain trace levels of heavy metals. Typical concentrations of heavy metals in CSO discharge are lower than the allowable concentration in the water column for Class I waters (see Table L-7). The CSO discharge would be diluted by the water flowing through the Narrows. During a normal tidal cycle, over 300 million gallons *per minute* pass through the Narrows. Based on the typical concentrations and this flow, the introduction of the CSO discharge would not lead to water quality violations.

Total Coliform

As part of the work under the *Coney Island Creek CSO Facility Planning Project*, potential impacts from the changes in total coliform discharges from the re-conveyance of CSO to the Verrazano Narrows was evaluated. The evaluations were performed using a modified version of the System-Wide Eutrophication Model (SWEM) which is a coupled hydrodynamic-water quality model developed for the Newtown Creek East River Water Quality Planning Project. The assessment was prepared for a one-in-five year storm event (4.53 inch storm event with a duration of 17 hours). The impact evaluation assessed comparisons of changes in coliform levels associated with the project, and evaluated such changes for determining conformance with

Table L-7

Metals Concentrations in CSO and Water Quality Standards

Constituent	Typical Concentration ($\mu\text{g/l}$)	Standard for Class I ($\mu\text{g/l}$)
Arsenic	1.0	36
Cadium	0.115	2.7
Copper	2.2	5.6
Lead	0.52	8.0
Mercury	0.0024	0.0026
Nickel	2.0	8.2
Zinc	10.3	66

Class I fishing classification total coliform standards. In addition, the potential impact on South Beach and Coney Island Beach from the re-conveyed CSO were also evaluated. The results of this mathematical modeling indicated that the predicted changes in total coliform levels at these beaches would be insignificant.

Conclusions

Based on the analyses described above, the proposed project is intended to provide localized benefits in water quality conditions, would meet EPA’s presumptive approach for satisfying combined sewer discharge reductions, and would not result in any significant adverse impacts on water quality.

M. HAZARDOUS MATERIALS

INTRODUCTION AND METHODOLOGY

The proposed project would entail the upgrade and rehabilitation of the existing Avenue V Pumping Station and the demolition of the remaining four structures on the site; installation of a dry weather flow force main along Avenue V, Stillwell Avenue, 27th Avenue, Cropsey Avenue, Bay 40th Street, and Shore Parkway; and installation of a wet weather flow force main paralleling the route of the dry weather flow force main to Shore Parkway then along Bay 16th Street and Bath Avenue (the “project site”) in Brooklyn; and disturbance and excavation of soils underlying those streets. If there are hazardous materials in the soil or groundwater on the project site, the disturbance of underlying soils during excavation and installation activities could expose workers and nearby residents to these materials. In addition, excavation activities could release harmful asbestos fibers or lead particles into the air if such building materials are present in the on-site structures that extend beneath the right-of-way of the street or abutting sidewalk. This chapter addresses the potential for the presence of hazardous materials resulting from previous and existing uses on the site and adjacent areas. All reports mentioned in this section are available for review at the offices of NYCDEP, Office of Environmental Planning and Assessment.

AVENUE V PUMPING STATION SITE

An assessment of existing conditions at the Avenue V Pumping Station is based on reports prepared by Warren & Panzer Engineers, P.C. (Warren & Panzer) for Hazen & Sawyer, P.C., the property consultant. Warren & Panzer's *Avenue V Pumping Station - Building Environmental Survey and Hazardous Materials Survey*, dated April 1998, included the following:

- An asbestos investigation including the collection and analysis of bulk samples and the estimating of the extent of asbestos-containing materials (ACM) present;
- A lead-based paint survey including testing representative interior components for lead-based paint by X-Ray Fluorescence analysis. In addition, paint chip samples were collected and analyzed by Atomic Absorption Spectrometry;
- The presence of lead jacketed cable and lead jointed pipe was investigated. The investigation involved reviewing drawing and specifications of original construction and subsequent renovations, a visual survey and the collection of samples from solder of suspect lead-jointed pipe; and
- Suspect Polychlorinated Biphenyls (PCBs) and mercury-containing materials were surveyed and sampled to obtain estimates for removal of these materials.

In addition, three geotechnical borings were performed at the pumping station site by Hazen & Sawyer and results reported in *Coney Island Creek - Avenue V Pumping Station, Task 3.2 Subsurface Investigations Geotechnical Boring Laboratory Analysis*, August 1998.

FORCE MAINS

Dry Weather Flow Force Main

The assessment of existing conditions of the subsurface soil and groundwater conditions along the proposed dry weather flow force main route is based on *Task 3.2 Subsurface Investigations Geotechnical Boring Laboratory Analysis*, dated August 1998, prepared by Hazen & Sawyer, *Sampling and Analysis Protocol - Avenue V Pumping Station Force Main Route*, dated July 1998 and *Avenue V Pumping Station Force Main Route, Site Assessment*, dated May 1999, prepared by AKRF, Inc. (AKRF). The 1999 assessment included the advancement of soil borings and the installation of groundwater monitoring wells; and collection and analysis of soil and groundwater samples.

Wet Weather Flow Force Main

An assessment of existing conditions along the proposed wet weather flow force main route is based on the *Avenue V Wet Weather Flow Force Main Route Phase I Environmental Site Assessment*. The Phase I Environmental Site Assessment (ESA) included the following:

- An inspection of the corridor and adjacent sidewalks and abutting properties to assess the current site conditions and determine whether there is evidence of potential site contamination;
- Examination of available historical maps (Sanborn insurance maps) to determine past land uses in and adjacent to the project site;
- Examination of New York State Department of Environmental Conservation (NYSDEC) and U.S. Environmental Protection Agency (EPA) records on releases or spills of toxic materials; known hazardous waste disposal sites; facilities that emit hazardous materials to the air or the sewer system; and facilities that generate, treat, or store hazardous wastes;

- Review of existing data on the geology and hydrogeology of the area; and
- Review of reports of past hazardous materials investigations and clean-up activities on the site and in the surrounding area.

EXISTING CONDITIONS

AVENUE V PUMPING STATION SITE

Warren & Panzer's *Building Environmental Survey and Hazardous Materials Survey* indicated that operations at the pumping station began in the early 1900's, after the Avenue V Pumping Station was built. A series of expansions and upgrades have taken place with one major construction project occurring in the early 1960's. In 1993-1994, the majority of the Pumping Station's asbestos-containing thermal system insulation was abated. Materials including pipe and pipe fitting insulation, boiler and breeching insulation and fireproofing were removed and replaced during the abatement. The April 1998 report included a site survey, sampling and analysis to confirm the presence or absence of asbestos, lead, PCBs and mercury. The report covered the Dry Well, Switchboard Room, Pump Room B, Garage and Crew Quarters.

Asbestos bulk sampling and analysis revealed the presence of several kinds of asbestos-containing materials including roofing materials, thermal systems insulation, caulking, and floor tiles located throughout the facility structures. It was estimated that abatement costs for the on-site asbestos-containing materials would be approximately \$50,000. Lead-based paint was observed in all facility structures inspected. It may be necessary to abate some of the lead-containing structures that are scheduled for renovation.

The facility was surveyed for lead-jacketed cable and lead-jointed pipe. No lead-jacketed cable was observed, however, approximately 300 linear feet of lead-jointed pipe was discovered in various on-site structures. No remedial action was recommended for the on-site lead-jointed pipe. No PCB-containing transformers or PCB-contaminated surfaces were detected at the site. Six PCB-containing fluorescent light ballasts were observed at the site. No remedial action was recommended for these ballasts. Lastly, analysis of wipe samples taken in the vicinity of mercury-containing instruments did not show significant concentrations compared to the concentrations found in background wipe samples.

Three geotechnical borings and subsurface soil analysis was performed by Hazen and Sawyer, P.C. in August 1998. Composite soil samples from the three borings were analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds, semivolatile organic compounds, pesticides, herbicides and metals. Additional analysis included ignitability, corrosivity, reactive cyanide and reactive sulfide by SW-846 methods. None of the samples exceeded the regulatory levels.

FORCE MAINS

Dry Weather Flow Force Main

Twenty-seven borings were performed by Hazen and Sawyer, P.C. along the dry weather flow force main route in August 1998. These borings were primarily intended to collect geotechnical data. However, composite soil samples from each of these borings were also analyzed for waste classification parameters, to determine whether any of the excavated soil would need to be handled and disposed of as a hazardous waste. The waste classification analyses included the Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds, semivolatile organic compounds, pesticides, herbicides and metals, and the tests for ignitability,

corrosivity, reactive cyanide and reactive sulfide by SW-846 methods. One sample from a boring location on 27th Avenue approximately 200 feet south of Harway Avenue exceeded the regulatory level for TCLP lead,

Based on these results, NYCDEP requested further characterization of soils and groundwater along the proposed Avenue V Pumping Station dry weather flow force main route. The *Sampling and Analysis Protocol - Avenue V Pumping Station Force Main Route* was developed by AKRF and submitted to the NYCDEP for approval in July 1998.

Subsequent to NYCDEP approval, a subsurface investigation was performed along the proposed dry weather flow force main route of the Avenue V Pumping Station. The *Avenue V Pumping Station Force Main Route, Site Assessment*, dated May 1999, included sampling and analysis of on-site soils to determine if hazardous materials were present in quantities high enough to pose a significant risk to construction workers and to people working or living in the neighborhoods during the installation of the pumping station and dry weather flow force main. The investigation included the installation of soil borings and monitoring wells and soil and groundwater sampling. The project site extends southwest along Avenue V from the Avenue V Pumping Station to Stillwell Avenue, across Stillwell Avenue to 27th Avenue, south on 27th Avenue to Cropsey Avenue, west along Cropsey Avenue to Bay 40th Street, south on Bay 40th Street to Shore Parkway and then west along the north shoulder of the Shore Parkway to the Verrazano Narrows Bridge in Fort Hamilton.

AKRF drilled ten soil borings along the proposed dry weather flow force main route and installed monitoring wells in seven of these borings. Sampling locations were based on the locations of past and present gasoline stations and other facilities which may be sources of contamination, as well as locations where petroleum-like odors were noted in the logs of the geotechnical borings. Soil samples were collected from each boring location and analyzed for volatile organic compounds (EPA Method 8260), semivolatile organic compounds (Method 8270), and priority pollutant metals (Method 6010 and 7471).

No significant levels of volatile organic compounds were detected in any of the samples. Semivolatile organic compounds were detected at levels exceeding New York State Department of Environmental Conservation recommended soil cleanup objectives in a number of samples. All the compounds detected at significant levels were polycyclic aromatic hydrocarbons (PAHs). PAHs are found in coal ash, incinerator ash, and other combustion products, as well as in asphalt and some petroleum products. Since these materials were commonly incorporated into fill material, it is not unusual to detect elevated levels of PAHs in historic fill material. The samples in which elevated levels of PAHs were detected were described in the boring logs as fill, containing fragments of brick, concrete, glass, coal, and cinders. These samples also contained levels of metals, including arsenic, lead, cadmium, mercury, zinc, copper, and selenium which exceed the levels commonly found in native soils.

Groundwater samples were collected from seven monitoring wells along the force main route, and were analyzed for volatile organic compounds and metals (both total and dissolved). No significant levels of volatile organic compounds were detected in any of the samples. The only metals detected at levels exceeding New York State Class GA standards were iron, magnesium, manganese, and sodium. These are all metals found in native soils and are not indicative of contamination. The elevated sodium levels reflect the salinity of groundwater in locations near the bay.

Wet Weather Flow Force Main

The proposed wet weather flow force main route parallels the dry weather flow force main to Shore Parkway and Bay 16th Street. It then extends east from Shore Parkway along Bay 16th Street to Bath Avenue and then north along Bath Avenue to 17th Avenue (Regulator 9A), a total distance of about 0.5 miles. No soil or groundwater testing was performed along this portion of the route. The potential for contamination was assessed based on the *Avenue V Wet Weather Flow Force Main Route Phase I Environmental Site Assessment*.

The entire length of Bay 16th Street east from Shore Parkway to Bath Avenue is lined with residential buildings. This area has been residential since 1906. The area along Bath Avenue from Bay 16th Street to 17th Avenue is lined with residential buildings with shops on the ground floor. The area has been developed in this way for over 100 years.

The only potential for contamination identified in the Phase I report was the presence of fuel oil tanks associated with the residential buildings along the route. However, there was no record of any spills with the potential to affect the soil or groundwater on the force main route.

THE FUTURE WITHOUT THE PROPOSED PROJECT

AVENUE V PUMPING STATION SITE

Since it is expected that without the proposed project, no asbestos-containing materials or lead-based paint would be disturbed, no significant adverse impacts related to hazardous materials would be expected to occur at the existing pumping station site.

FORCE MAINS

Dry Weather Flow Force Main

Since it is expected that without the project, soil would not be excavated and disposed of as hazardous waste, no significant adverse impacts related to hazardous materials would be expected to occur along the dry weather flow force main route.

Wet Weather Flow Force Main

Since it is expected that without the proposed project, soil would not be excavated and disposed of as hazardous waste, no significant adverse impacts related to hazardous materials would be expected to occur along the wet weather flow force main route.

PROBABLE IMPACTS OF THE PROPOSED PROJECT

AVENUE V PUMPING STATION SITE

Asbestos-containing materials and lead paint were located throughout the facility structures. Therefore, demolition or renovation of portions of these buildings would be undertaken in accordance with applicable City, State, and Federal regulations which require removal of asbestos-containing materials prior to demolition. Asbestos would be removed, transported, and disposed of in accordance with all regulations. With these procedures in place, no significant adverse impacts would occur as a result of the asbestos removal.

Proposed demolition and construction activities may involve disturbance of surfaces with lead-based paint. U.S. Occupational Safety and Health Administration (OSHA) regulations specify measures to protect workers from exposure to lead during such activities and these regulations

would be complied with. With the implementation of these measures, no significant adverse impacts related to hazardous materials are expected to occur as a result of the demolition and construction activities for the proposed project.

The existing 550-gallon diesel underground storage tank (UST) and two 1,200-gallon aboveground storage tanks (AST) would be emptied and removed in accordance with federal, state, and local regulations and procedures. Excavation of the tank and soils would involve inspection and testing if potential petroleum-contaminated soils are observed. A new 2,500-gallon diesel oil underground storage tank would be installed at the center of the site (approximately). The tank would be designed and installed to NYSDEC standards for petroleum storage tanks.

Any areas of the site not covered by buildings or pavement after construction will be covered by at least one foot of clean imported top soil/fill.

The handling, storage, and disposal of contaminated or hazardous materials encountered at the project site will be done in accordance with all applicable regulatory protocols. An environmental construction health and safety plan (CHASP) to assure that the construction workers, the surrounding community, and the environment are not adversely affected by the construction activities. The plan would specify the appropriate testing and/or monitoring by field personnel during construction and excavation activities and measures to control dust or fumes from excavation activities. The CHASP will be submitted to NYCDEP for review and approval prior to the start of construction.

FORCE MAINS

If soil excavated along the project corridor is taken off-site, it will be disposed of as either C & D waste, petroleum-contaminated waste or as an industrial waste. Excavated soil containing only soil, rock, brick, concrete, asphalt, wood, etc. is a C & D waste and must go to a registered C & D disposal facility. Fill material that also contains ash, slag, or other combustion products is an industrial waste and must be disposed of at a permitted industrial waste disposal facility.

Elevated levels of lead were detected in some samples of fill containing ash and other wastes. If this material is to be disposed of off-site, it must be tested to determine whether it meets the acceptance criteria of the disposal facility. If soil exceeds the TCLP standard for lead, it would be disposed of at licensed hazardous waste facility.

Excavation activities will increase potential exposure pathways to the metals and PAHs in the soil. In addition, although the testing on the sites detected no evidence of petroleum contamination, petroleum-contaminated soil from unreported or historical releases could potentially be exposed during excavation activities. Similar to the CHASP developed for the construction work at the Avenue V Pumping Station, in order to prevent impacts to workers and nearby residents, all excavation and construction work involving soil disturbance will be performed under a CHASP to assure that the construction workers, the surrounding community, and the environment are not adversely affected by the construction activities. The plan would specify the appropriate testing and/or monitoring by field personnel during construction and excavation activities and measures to control dust or fumes from excavation activities. The plan will also detail appropriate measures in the event that underground storage tanks, soil and groundwater contamination, or other unforeseen environmental conditions are encountered. The CHASP will be submitted to NYCDEP for review and approval prior to the start of construction. The handling, storage, and disposal of contaminated or hazardous materials encountered along

the construction of the force mains will be done in accordance with all applicable regulatory protocols.

CONCLUSIONS

With the implementation of all measures discussed above, no significant adverse impacts related to hazardous materials are expected to occur as a result of the excavation and construction activities for the proposed project.

N. WATERFRONT REVITALIZATION PROGRAM

WATERFRONT REVITALIZATION PROGRAM

The project site falls within the boundaries of New York City's Coastal Zone and therefore was assessed for its consistency with the City's Local Waterfront Revitalization Program (LWRP). The LWRP establishes the City's Coastal Zone and includes a set of 10 policy statements that addresses the waterfront's resources. The Consistency Assessment Form is attached.

The Avenue V Pumping Station is approximately 1 mile from Gravesend Bay, and the distance between the proposed force main route and the bay varies between 250 to 5,000 feet. Therefore, the policies of the Local Waterfront Revitalization Program are presented below. As presented in the discussions below, the Avenue V Pumping Station rehabilitation and Force Mains installation would be consistent with New York City's LWRP.

Policy 1: Support and facilitate commercial and residential redevelopment in appropriate coastal zone areas.

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

This policy is not applicable

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

The project is a water quality improvement project that is expected to result in water quality benefits, especially near the Coney Island Creek waterfront.

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

The proposed project would not discourage redevelopment within the service area.

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 project site is not located within a Significant Maritime and Industrial Area; therefore, this policy does not apply.

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

The project would not discourage working waterfront uses outside the Significant Maritime and Industrial Areas.

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

The proposed project, an infrastructure improvement project, will better serve and support working waterfront uses.

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.

This policy is not applicable.

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

This policy is not applicable.

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

This policy is not applicable.

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, nor is there any natural area located on the project site. Therefore, this policy does not apply.

Policy 4.2: Protect and restore tidal and freshwater wetlands.

The project would not adversely affect the tidal and freshwater wetlands.

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.

There are no vulnerable plant, fish, or wildlife species, or rare ecological communities on the project sites. Therefore, this policy does not apply.

Policy 4.4: Maintain and protect living aquatic resources.

The proposed project would not adversely affect living aquatic resources, and some benefits to such resources may result in Coney Island Creek from the re-conveyance of CSO from this water body.

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

Policy 5.1: Manage direct or indirect discharges to waterbodies.

Because the project involves the discharge of storm water and CSO, it requires a location near the waterfront and discharge points along the water's edge. By moving the CSO discharge

from Coney Island Creek to the Verrazano Narrows, the water quality in Coney Island Creek would improve, and mathematical modeling has demonstrated that water quality in Verrazano Narrows would not be adversely affected.

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

The proposed project is not expected to generate any significant nutrients or pollutants or contribute non-point source pollution.

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

The proposed project would not result in excavation or placing fill in such locations.

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

There are no streams or wetlands that have sources on the project site. Dewatering during construction is not expected to affect such sources.

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.

This policy is not applicable.

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

The proposed project would not affect flood prevention or erosion control measures.

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

There are no non-renewable sources of sand on 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.

As part of construction of the proposed action, the health and safety plan would protect workers and the public during the construction period. All hazardous materials would be handled and disposed of in accordance with all applicable regulations during demolition, renovation, construction of the proposed action.

Policy 7.2: Prevent and remediate discharge of petroleum products.

The proposed project would not affect petroleum products. Any petroleum contaminated soils that need to be removed from the site would be disposed of in accordance with all applicable regulations.

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.

The proposed action would not be expected to result in the degradation of coastal resources.

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 would not affect access to the waterfront.

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

The proposed project would not affect public access into new public and private development.

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

The proposed project would not affect visual access to coastal lands, waters, and open space.

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

The proposed project would involve the construction of force mains adjacent to Shore Parkway. The Shore Parkway is also owned by New York City and is mapped parkland. The placement of the force mains underground would not adversely affect the waterfront open space and recreation on publicly owned land.

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 would not affect lands and waters held in public trust by the State and City.

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 would not impair any scenic resource.

Policy 9.2: Protect scenic values associated with natural resources.

The proposed project is not located in a Special Natural Heritage Area District, Special Natural Waterfront Area, or Recognized Ecological Complex. The proposed project would replace trees that need to be cut down for the installation of force mains. NYCDEP will continue to work with the New York City Department of Parks and Recreation to reach an agreement how to replace such losses in habitat. Therefore, the project would protect scenic values associated with natural resources.

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 Avenue V Pumping Station is owned by New York City and its use would not change with the project. The historic characteristics of the Main Building would be preserved by its

rehabilitation, and the building would remain eligible for listing on the National or State Register of Historic Places. The rehabilitation would halt the deterioration that has taken place in the building's condition. The proposed project would not result in any indirect significant adverse impacts on any sites listed on the State and National Registers of Historic Places.

Policy 10.2: Protect and preserve archaeological resources and artifacts.

Potential archaeological resources that could be affected by the construction of the force mains have been identified. The selection of the force main routes and methods of construction have been developed to minimize such potential impacts on archaeological resources. Therefore, the subsurface disturbances that would result from construction would not have a significant adverse impact on archaeological resources.

O. INFRASTRUCTURE

The proposed pumping station upgrade and force main construction is an infrastructure project designed to improve the conveyance of wastewater in the Avenue V Pumping Station drainage area—a 2,900-acre parcel in the southeastern portion of the Owls Head WPCP's service area—and satisfy CSO abatement requirements to improve water quality conditions at Coney Island Creek. During design of the project and construction, coordination within NYCDEP and among other entities with underground utilities would be taken to avoid disturbing existing utility lines.

The proposed project would not increase water demand and would therefore not significantly affect the City's water supply system. There would be no significant difference in fresh water usage from the water supply system. Rather, there would be a nominal decrease in water usage and sewage generation due to the conversion of the pumping station from a staffed to an unstaffed facility. Hence, water usage and sewage generation would result from an occasional station visitor rather than daily staff use.

The changed of the CSO discharge point from Coney Island Creek to Verrazano Narrows would not lead to an increase in the actual flows to the Owls Head WPCP and would not interfere with its ability to properly treat sewage. No significant adverse impacts on infrastructure would occur with the proposed project.

P. SOLID WASTE AND SANITATION SERVICES

Based on operating experience at the pumping station, mechanically cleaned bar screens are not required to filter wastewater flows passing through the station; therefore, the proposed upgraded facility plan does not currently include screens. However, grinders would be installed to reduce the particle size of any incoming solids. These solids would be conveyed to the Owls Head WPCP for processing, and no noticeable increase in volume of screening materials at Owls Head WPCP is expected. The proposed project is not expected to generate an increased solid waste or service demand. The proposed unstaffed facility would not generate significant volumes of solid waste. No significant adverse impacts on infrastructure would occur with the proposed project.

Q. ENERGY

The upgraded pumping station would not affect the transmission or generation of energy. In addition, the proposed project would not generate substantial indirect consumption of energy. Energy during construction would be provided from existing Con Edison connections. New service would be brought in for operation of the upgraded pumping station, and the network protection structure will support reliable energy distribution to the site.

R. TRAFFIC AND TRANSPORTATION

Because the station would be unstaffed, vehicular trips to and from the pumping station would be limited to trips associated with station maintenance. The traffic estimate resulting from the proposed project would be two vehicular trips per day. In addition, parking would be provided on-site to accommodate NYCDEP vehicles. For information on project impacts to traffic and transportation during project construction, see Section V, “Construction Impacts,” below.

S. AIR QUALITY

INTRODUCTION

The proposed upgraded pump station would include the installation of one fixed reciprocating engine emergency generator (and one mobile backup emergency generator) to provide back-up power if utility service becomes unavailable (one operating and one spare). The operating emergency generators would have a nominal (standby) rating of 1,000 kilowatts (kW) and would be operated regularly for testing and exercising. A forced air heating system would be installed for comfort heating. Emissions from the emergency generator and heating system were modeled to assess the effects of maintenance testing and exercising. An analysis was performed to determine whether the upgrade may result in potential impacts from emissions for the criteria pollutants of concern (nitrogen oxides [NO_x], sulfur dioxide [SO₂], carbon monoxide [CO] and fine particulate matter [PM₁₀ and PM_{2.5}]).

As discussed in Section R., “Traffic and Transportation”, the proposed upgraded pump station would generate an insignificant number of vehicle trips. Since the proposed project would result in fewer than *CEQR Technical Manual* threshold of 100 new peak hour vehicle trips at nearby intersections in the study area, a quantified assessment of on-street mobile source emissions is not warranted.

PROJECT SITE

The residential buildings of the Marlboro Houses are adjacent to the south of the site and across 11th Street. Smaller two and three story homes are across Avenue V to the north and east. Additional sensitive receptor locations—such as parks and playgrounds—are farther from the pumping station to the northwest and east.

EQUIPMENT OPERATION

The emergency generator would operate for a maximum of 30 minutes once per month for maintenance and testing purposes, and for a maximum of two hours once per year. Therefore, two operating scenarios were modeled; a short-term scenario for two hours, and an annual scenario reflecting up to eight hours of operation per year. Both scenarios assume that the emergency generator would operate at full standby load. The proposed future heating system was assumed to operate continuously at 100 percent load. The facility currently has a heating system that utilizes the same fuel type (natural gas), exhaust point and is slightly larger than the heating system proposed in the future. The heating unit will be slightly smaller under the proposed project, because the size of the facilities would decrease with the proposed project.

POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while

emissions from fixed facilities are referred to as stationary source emissions. Typically, ambient concentrations of CO are predominantly influenced by mobile source emissions. Volatile organic compounds (VOCs) and nitrogen oxides (NO and NO₂, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Emissions of SO₂ are associated mainly with stationary sources, and sources utilizing non-road diesel such as diesel trains, marine engines and non-road vehicles such as construction engines, but diesel-powered vehicles, primarily heavy duty trucks and buses, also currently contribute somewhat to these emissions; diesel fuel regulations which will begin to take affect in 2006 will reduce SO₂ emissions from mobile sources to extremely low levels. Particulate matter (PM) is emitted from both stationary and mobile sources. Fine particulate matter is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs, emitted mainly from industrial processes and mobile sources.

CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. Since CO is a reactive gas which does not persist in the atmosphere, CO concentrations can vary greatly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be predicted on a local, or microscale, basis. Potential impacts from the fuels to be burned for the proposed upgraded pump station emergency generator and heating system were evaluated.

NITROGEN OXIDES, VOCS, AND OZONE

NO_x are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions; the change in regional mobile source emissions of these pollutants would be related to the total vehicle miles traveled added or subtracted on various roadway types throughout the New York and New Jersey metropolitan area, which is designated as a severe non-attainment area for ozone by the U.S. Environmental Protection Agency (EPA).

In addition, there is a standard for average annual NO₂ concentrations, which is normally examined only for fossil fuel energy sources. Potential impacts from the fuels to be burned for the proposed upgraded pump station emergency generator and heating system were evaluated.

LEAD

Lead emissions in air are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor vehicle related lead emissions have decreased. As a result, ambient

concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one-quarter the level in 1975.

In 1985, EPA announced new rules drastically reducing the amount of lead permitted in leaded gasoline. The maximum allowable lead level in leaded gasoline was reduced from the previous limit of 1.1 to 0.5 grams per gallon effective July 1, 1985, and to 0.1 grams per gallon effective January 1, 1986. Monitoring results indicate that this action has been effective in significantly reducing atmospheric lead concentrations. Effective January 1, 1996, the Clean Air Act banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles, concluding the 25-year effort to phase out lead in gasoline. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the national standard of 1.5 micrograms per cubic meter (3-month average).

No significant sources of lead are associated with the proposed project, and, therefore, analysis was not warranted.

RESPIRABLE PARTICULATE MATTER—PM₁₀ AND PM_{2.5}

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of naturally occurring volatile organic compounds, salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires; naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines and home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. Particulate matter also acts as a substrate for the adsorption of other pollutants, often toxic and some likely carcinogenic compounds.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers, or PM_{2.5}, and particles with an aerodynamic diameter of less than or equal to 10 micrometers, or PM₁₀, which includes PM_{2.5}. PM_{2.5} has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorbed to the surfaces of the particles, and is also extremely persistent in the atmosphere. PM_{2.5} is mainly derived from combustion material that has volatilized and then condensed to form primary particulate matter (often soon after the release from an exhaust pipe or stack) or from precursor gases reacting in the atmosphere to form secondary PM.

An analysis was conducted to assess the worst case PM impacts due to the proposed upgraded pumping station's emergency generator and heating system.

SULFUR DIOXIDE

SO₂ emissions are primarily associated with the combustion of sulfur-containing fuels: oil and coal. Due to the federal restrictions on the sulfur content in diesel fuel for on-road vehicles, no significant quantities are emitted from vehicular sources. Monitored SO₂ concentrations in New York City are below the national standards. As part of the proposed project, oil with a maximum

sulfur content of 0.2 percent would be combusted in the emergency generator. Therefore, potential future levels of SO₂ from the proposed upgraded pumping station's emergency generator and heating system were examined.

AMBIENT AIR QUALITY REGULATIONS, STANDARDS AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act, primary and secondary NAAQS have been established for six major air pollutants: CO, NO₂, ozone, respirable PM (both PM_{2.5} and PM₁₀), SO₂, and lead. The primary standards protect public health and represent levels at which there are no known significant effects on human health. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. For NO₂, ozone, lead and PM, the primary and secondary standards are the same; there is no secondary standard for CO. EPA promulgated additional NAAQS which became effective September 16, 1997: a new 8-hour standard for ozone, which will replace the existing 1-hour standard, and in addition to retaining the PM₁₀ standards, EPA adopted 24-hour and annual standards for PM_{2.5}. The standards for these pollutants are presented in Table S-1. These standards have also been adopted as the ambient air quality standards for New York State.

NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS (SIP)

The Clean Air Act, as amended in 1990 (CAA) defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which is a state's plan on how it will meet the NAAQS under the deadlines established by the CAA.

EPA has re-designated New York City as in attainment for CO. The CAA 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 PM₁₀. 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 have 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 EPA models—the mobile source emissions model MOBILE6.2, and the non-road emissions model NONROAD—which have been recently 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

Table S-1
Ambient Air Quality Standards

Pollutant	Primary		Secondary	
	ppm	µg/m ³	ppm	µg/m ³
Carbon Monoxide (CO)				
Maximum 8–Hour Concentration ¹	9	10,000	None	
Maximum 1–Hour Concentration ¹	35	40,000		
Lead				
Maximum Arithmetic Mean Averaged Over 3 Consecutive Months	NA	1.5	NA	1.5
Nitrogen Dioxide (NO₂)				
Annual Arithmetic Average	0.053	100	0.053	100
Ozone (O₃)				
1–Hour Average ²	0.12	235	0.12	235
8–Hour Average ³	0.08	157	0.08	157
Total Suspended Particles (TSP)				
Annual Mean	NA		None	
Rural Open Space		45		
Rural Residential		55		
Urban Residential		65		
Urban Industrial	75			
Maximum 24–Hour Concentration	NA	250		
Respirable Particulate Matter (PM₁₀)				
Average of 3 Annual Arithmetic Means	NA	50	NA	50
24–Hour Concentration ¹	NA	150	NA	150
Fine Respirable Particulate Matter (PM_{2.5})				
Average of 3 Annual Arithmetic Means	NA	15	NA	15
24–Hour Concentration ⁴	NA	65	NA	65
Sulfur Dioxide (SO₂)				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24–Hour Concentration ¹	0.14	365	NA	NA
Maximum 3–Hour Concentration ¹	NA	NA	0.50	1,300
<p>Notes: ppm – parts per million µg/m³ – micrograms per cubic meter NA – not applicable</p> <p>Particulate matter concentrations are in µg/m³. Concentrations of all gaseous pollutants are defined in ppm — approximately equivalent concentrations in µg/m³ are presented.</p> <p>TSP levels are regulated by a New York State Standard only. All other standards are National Ambient Air Quality Standards (NAAQS).</p> <p>¹ Not to be exceeded more than once a year. ² Applies only to areas designated as Non Attainment. ³ Three–year average of the annual fourth highest daily maximum 8–hr average concentration. ⁴ Not to be exceeded by the 98th percentile averaged over 3 years.</p> <p>Sources: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards; 6 NYCRR Part 257: Air Quality Standards.</p>				

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 will be 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.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

Any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see Table S-1) would be deemed to have a potential significant adverse impact. In addition, in order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

Interim Guidance Criteria Regarding PM_{2.5} Impacts

The New York City Department of Environmental Protection (NYCDEP) is currently employing interim guidance criteria for evaluating potential PM_{2.5} impacts from NYCDEP projects subject to City Environmental Quality Review (CEQR). The interim guidance criteria currently employed by NYCDEP for determination of potential significant adverse impacts from PM_{2.5} are as follows:

- Predicted 24-hour (daily) average increase in PM_{2.5} concentrations greater than 5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) at a discrete location of public access, either at ground or elevated levels (microscale analysis); and
- Predicted annual average increase in ground-level PM_{2.5} concentrations greater than 0.1 $\mu\text{g}/\text{m}^3$ on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating background monitoring stations).
- In addition, NYSDEC considers incremental annual impacts of PM_{2.5} greater than 0.3 $\mu\text{g}/\text{m}^3$ from stationary sources, at any discrete ground-level or elevated location as having a potential for significant impact.

Actions under CEQR that would increase PM_{2.5} concentrations by more than the NYCDEP or NYSDEC interim guidance criteria above are considered to have potential significant adverse impacts. NYCDEP recommends that its actions subject to CEQR that fail the interim guidance criteria prepare an EIS and examine potential measures to reduce or eliminate such potential significant adverse impacts.

The above NYCDEP and NYSDEC interim guidance criteria have been used for the purpose of evaluating the significance of predicted impacts of the proposed project on PM_{2.5} concentrations from emission sources, and determine the need to minimize particulate matter emissions from the proposed project.

METHODOLOGY

DISPERSION MODELS

Potential impacts from the emergency generator and heating system were evaluated using the Industrial Source Complex Short Term (ISCST3) dispersion model developed by the U.S. Environmental Protection Agency (EPA) and described in the User's Guide for the Industrial Source Complex (ISCST3) Dispersion Models (EPA-454/B-95-003a). The ISCST3 model calculates pollutant concentrations from one or more point (e.g., exhaust stacks), area, or volume sources based on hourly meteorological data, and has the capability of calculating pollutant concentrations at locations where the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. Computations with the ISCST3 model to determine impacts from the Avenue V Pumping Station were made assuming stack tip downwash, buoyancy-induced dispersion, gradual plume rise, urban dispersion coefficients and wind profile exponents (with and without building downwash), and elimination of calms.

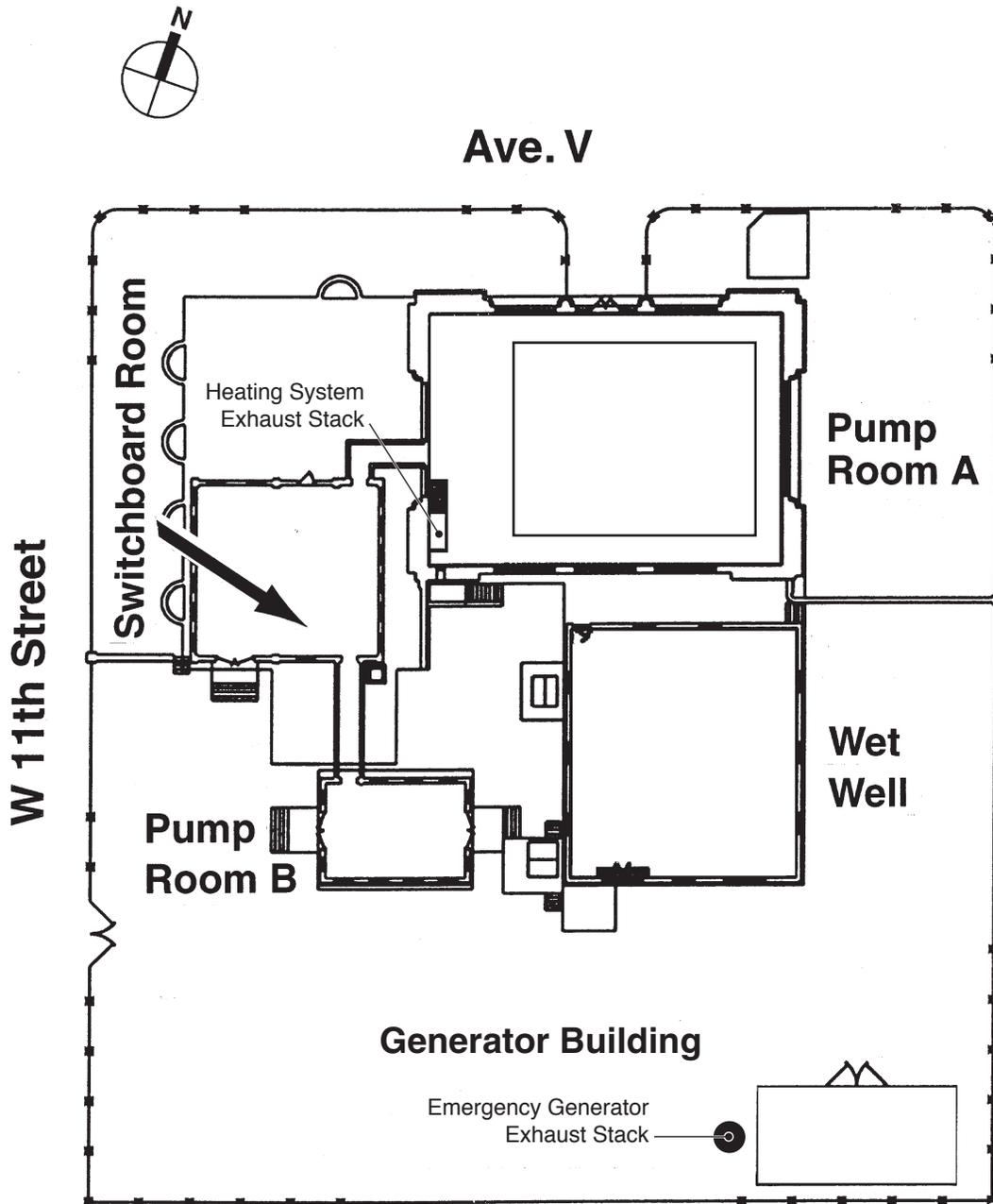
Since the ISCST3 model does not predict impacts within the cavity region that is created downwind of buildings and other structures, impacts within this area were estimated using the ISC Plume Rise Model Enhancements (ISCPRIME) model. The ISCPRIME model is a modification of the ISCST3 model that can predict impacts within the cavity wake region. The highest (worst-case) of the two model predicted impacts, ISCST3 or ISCPRIME, were used for comparison to the NAAQS and the NYCDEP PM_{2.5} interim guidance. The worst case assumptions for stack exhaust parameters used for ISCST3 modeling were also used for the ISCPRIME modeling.

EMISSION ESTIMATES AND STACK PARAMETERS

Table S-2 presents information on emission rates and stack exhaust characteristics used in the dispersion modeling analysis.

For this analysis, the emission rate of PM for the emergency generator was based on a performance level of 0.062 grams per brake horsepower per hour (including both filterable and condensable PM). Since the facility currently has a heating system that utilizes natural gas, has the same exhaust point and is slightly larger than the unit planned under the proposed project, the PM_{2.5} incremental analysis for the proposed project was based on the incremental emissions associated with the emergency generator. However, for the PM₁₀ analysis, both the proposed emergency generator and the heating systems were included in the analysis to compare with PM₁₀ standards.

The emergency generator stack was modeled towards the western side of the Generator Building (see Figure 21) and the heating system exhaust was modeled at the existing chimney location on the southwestern side of the pump station building. Equipment scenarios and stack parameters were developed based on information obtained from the project design, the technical specifications, vendor data, and EPA emission factors published in AP-42. The emergency generator brake horsepower rating was estimated based on vendor data on generator equipment with a similar use and capacity.



**Table S-2
Stack Parameter Data**

Parameter	Value	
	Emergency Generator	Heating System
Stack Diameter, Feet	1	0
Stack Exit Velocity, Feet/Second	55.2	0.00
Stack Exit Temperature, degrees Fahrenheit (° F)	744	68
Short Term Emission Rates (lb/hr)		
SO ₂	2.01 ⁽¹⁾	0.0008
PM	0.18 ⁽²⁾	0.011
CO	1.51 ⁽³⁾	0.19
Annual Emission Rates (lb/hr)⁽⁴⁾		
SO ₂	0.0018 ⁽¹⁾	0.0008
PM	0.000021 ⁽²⁾	0.011
NO ₂	0.022 ⁽³⁾	0.14
Notes: ⁽¹⁾ Emissions based on Section 3.1 of EPA AP-42, assuming a fuel higher heating value of 140,000 British Thermal Units per gallon and a fuel sulfur content of 0.2 percent. ⁽²⁾ Emissions based on an assumed emission factor of 0.062 grams per brake horsepower per hour. ⁽³⁾ Based on vendor data. ⁽⁴⁾ Based on eight hours of emergency generator operation per year for testing and maintenance.		

METEOROLOGY

The meteorological data set consisted of the latest five years of meteorological data that are available: surface data collected at JFK Airport (1999-2003) and concurrent upper air data collected at Brookhaven, New York. This meteorological data provides hour-by-hour wind speeds and directions over a five-year period. JFK airport data is most appropriate since the project site is located in the southern part of Brooklyn.

RECEPTOR LOCATIONS

A comprehensive set of receptors was developed for the modeling analysis. A polar grid was used and consisted of ground-level receptors at a 1.8 meter elevation located along 36 radial rings ranging from 40 meters to 2,000 meters, spaced at 30 meters intervals (approximately 100 feet). Along the property boundary of the Avenue V Pumping Station, receptors were placed at a 20 meter incremental spacing to determine impacts at the fenceline.

Discrete receptors (i.e., off-site locations) including nearby sensitive uses and elevated locations were also modeled to account for impacts on upper floors of the sensitive receptors. Sensitive

receptor locations included residential buildings such as the Marlboro Houses and smaller homes near the project site. These discrete receptor locations were determined from site visits and land use maps of the area.

The receptor grid and discrete receptor networks ensured that the maximum potential impacts from the sources at the Avenue V Pumping Station were identified.

BACKGROUND CONCENTRATIONS

Background concentrations were added to modeling results to obtain total pollutant concentrations at a receptor site (see Table S-3). Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis. The most representative monitoring site(s) were chosen and the highest concentration over the most recent five years of monitoring (1999 to 2003) was used for NO₂ and SO₂, and three years of monitoring (2001 to 2003) was used for other criteria pollutants, as per NYCDEP guidance.

**Table S-3
Maximum Background Pollutant Concentrations**

Pollutant	Averaging Period	Location	Concentration (µg/m³)	NAAQS (µg/m³)
PM ₁₀	24 Hour	JHS 126, Brooklyn	50	150
	Annual		20	50
SO ₂	3 hour	Queensboro Community College	165	1,300
	24 hour		86	365
	Annual		18	80
CO	1-hour	Queensboro Community College	4,008	40,000
	8-hour		2,863	10,000
NO ₂	Annual	Queensboro Community College	49	100

Sources: 1999-2003 Annual New York State Air Quality Report Ambient Air Monitoring System, NYSDEC.

PROBABLE IMPACTS OF THE PROPOSED PROJECT

DEP is working on the conclusion of the air modeling analysis. However, no potential for significant impact is anticipated. Finals results are forthcoming

T. ODOR ANALYSIS

INTRODUCTION

Related to the CSO concerns in Coney Island Creek, it is planned that the Avenue V Pumping Station be rehabilitated and upgraded from its current hydraulic capacity of approximately 30 mgd to 80 mgd. Included in this upgrade would be the installation of a manhole vent to allow free exchange of air between the covered Wet Well on-site and the outside air. Currently, the Avenue V Pumping Station has no odor control. Odor impact modeling was performed to

determine the impacts of hydrogen sulfide (H₂S). Generally H₂S is used as a trace indicator for odors in an odor impact analysis. H₂S is a good way to detect odor because:

- It has a very unique, unpleasant, and discernable odor character (similar to rotten eggs);
- It has a very low odor recognition threshold; and
- It can be monitored by hand-held and/or stationary instruments.

The analysis was performed to determine whether the upgrade may potentially result in potential impacts from emissions of H₂S. Impacts were compared to the 1 part per billion (ppb) NYCDEP H₂S odor impact threshold at sensitive receptor locations (e.g., residences, schools, hospitals, churches). This comparison to the 1 ppb H₂S threshold conservatively did not account for existing emissions from the facility. Impacts were also compared with the 1-hour average New York State Ambient Air Quality Standard (NYSAAQS) of 10 ppb for H₂S, which is applicable for all locations beyond the property line of Avenue V Pumping Station and is used to protect the health and quality of life for the surrounding community. Compliance with the 1 ppb H₂S threshold at sensitive receptors and 10 ppb H₂S levels at any off-site location from the proposed Avenue V Pumping Station sources are demonstrated through the use of air dispersion models.

PROJECT SITE

The residential buildings of the Marlboro Houses are adjacent to the site. Smaller two- and three- story homes are across Avenue V to the north and east. Additional sensitive receptor locations, such as parks and playgrounds, are farther from the pumping station to the northwest and east.

METHODOLOGY

DISPERSION MODELS

Potential odor impacts from stationary source emissions were evaluated using the Industrial Source Complex Short Term (ISCST3) dispersion model developed by EPA and described in *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models* (EPA-450/B-95-003a). The ISCST3 model calculates pollutant concentrations from one or more point (e.g., exhaust stacks), area, or volume sources based on hourly meteorological data, and has the capability of calculating pollutant concentrations at locations where the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. Computations with the ISCST3 model to determine impacts from the Avenue V Pumping Station were made assuming stack tip downwash, buoyancy-induced dispersion, gradual plume rise, urban dispersion coefficients and wind profile exponents (with and without building downwash), and elimination of calms.

Since the ISCST3 model will not predict impacts within the cavity region that is created downwind of buildings and other structures, impacts within this area were estimated using the ISC Plume Rise Model Enhancements (ISCPRIME) model. The ISCPRIME model is a modification of the ISCST3 model that can predict impacts within the cavity wake region. The highest (worst-case) of the two model predicted impacts, ISCST3 or ISCPRIME, were used for comparison to the H₂S NYSAAQS and the NYCDEP odor criteria. The worst case assumptions for stack exhaust parameters used for ISCST3 modeling were also used for the ISCPRIME modeling.

EMISSION ESTIMATES AND STACK PARAMETERS

Table T-1 presents information on the exhaust characteristics used in the dispersion modeling analysis.

Table T-1
Stack Parameter Data

Parameter	Value
Stack Height, Feet	3
Stack Diameter, Feet	0
Stack Exit Velocity, Feet/second	0.003
Stack Exit Temperature, °F	68
Note: Parameters based on <i>CEQR Technical Manual</i> guidance.	

The default conservative stack exhaust parameters recommended in the *City Environmental Quality Review (CEQR) Technical Manual* were used for the manhole vent emissions of the Avenue V Pumping Station (see Table T-1). The stack height was assumed to be three feet above local grade. These worst case assumptions were employed for the odor impact modeling analysis. Use of actual designed values for these parameters would not have a significant effect on the predicted off-site concentrations.

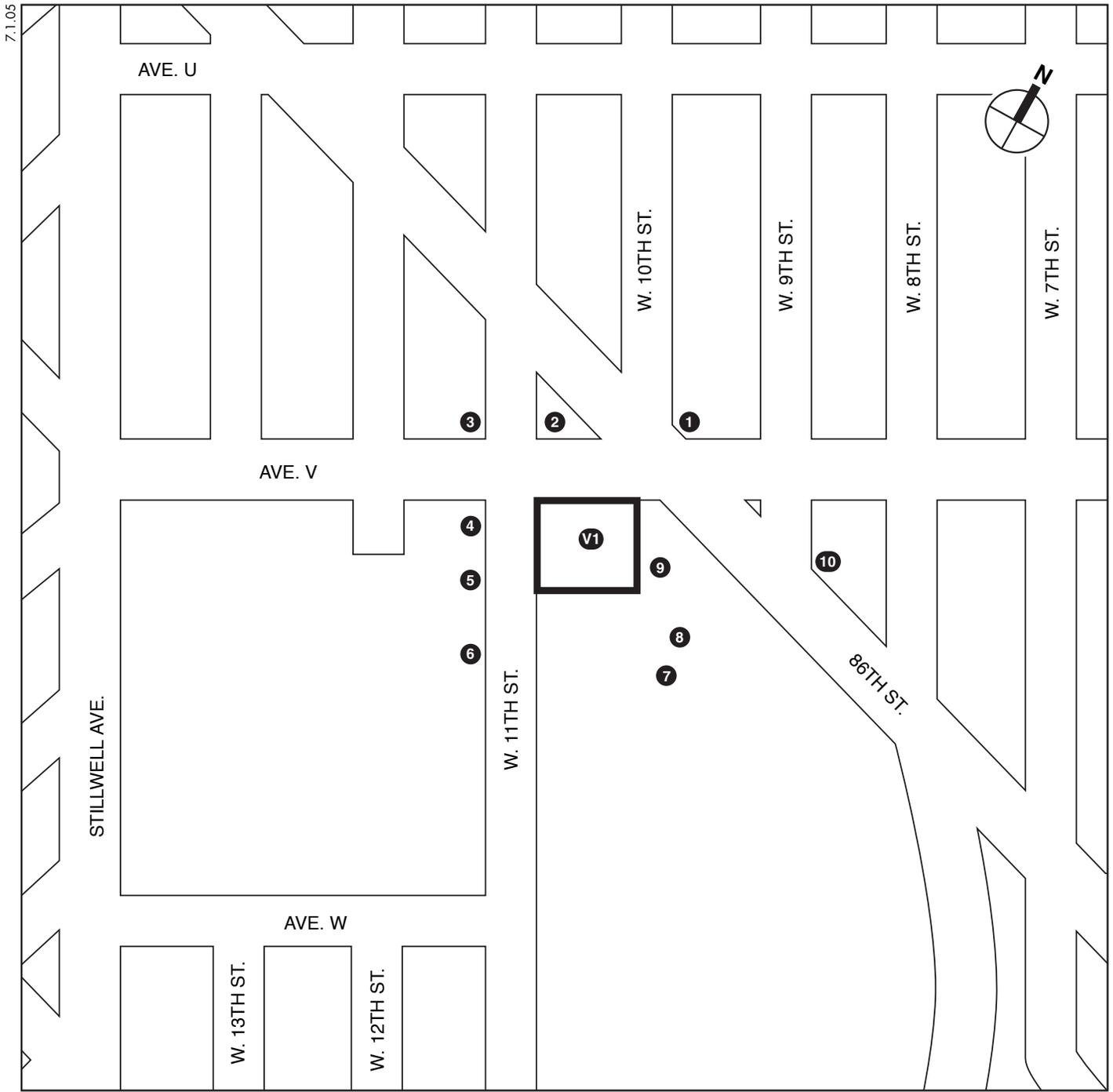
The manhole vent was modeled at the northwestern section of the Wet Well. Potential maximum 1-hour off-site impacts from the facility were determined based on direct measurement of H₂S concentrations at the Avenue V Pumping Station Wet Well.

METEOROLOGY

The meteorological data set consisted of the latest five years of meteorological data that are available: surface data collected at JFK Airport (1999-2003) and upper air data collected at Brookhaven, New York. This meteorological data provides hour-by-hour wind speeds and directions over a five-year period. JFK airport data were selected, since the project site is located in the southern part of Brooklyn.

RECEPTOR LOCATIONS

A generalized polar receptor grid (i.e., radial rings of receptors placed at multiple distances from the site boundary to a 300-foot radius from the site) was developed for the modeling analysis. The base receptor grid consisted of ground-level receptors at 1.8 meters located along 36 radial rings at distances ranging from the property line of the Avenue V Pumping Station to 300 feet. A property boundary grid was established with receptor spacing at 50 foot intervals. These grids ensured that the maximum potential impacts from the sources at the Avenue V Pumping Station were identified. Discrete receptors (i.e., off-site locations) including nearby sensitive uses and elevated locations were also modeled. Sensitive receptor locations included in the modeling are residential buildings including the Marlboro Houses and smaller homes near the project site (see Figure 22). Other discrete receptor locations included surrounding commercial buildings that may be affected by any odor impacts. These discrete receptor locations were determined from land use maps of the area. Where appropriate, elevated, or flagpole receptors were also included to account for the upper stories of the sensitive receptors. These flagpole receptors represent windows or balconies at the multi-story locations.



Proposed Avenue V Pumping Station



SOURCE LOCATIONS

V1 Vent 1 Location

RECEPTOR LOCATIONS

- 1** Automotive Use
- 2** Automotive Use
- 3** Residential - 2-Story
- 4** Residential - 2-Story
- 5** Residential Marlboro Houses
- 6** Residential Marlboro Houses
- 7** Residential Marlboro Houses
- 8** Residential Marlboro Houses
- 9** Vacant Industrial Building - 1-story
- 10** Residential with Ground Floor Dentist Office

BACKGROUND CONCENTRATIONS

Typically, background concentrations must be added to modeling results to obtain total pollutant concentrations at a prediction site. Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis. Since this odor impact analysis focuses on maximum short-term H₂S levels, background concentrations of H₂S were assumed to be zero.

PROBABLE IMPACTS OF THE PROPOSED PROJECT

DEP is working on the conclusion of the odor modeling analysis. However, no potential for significant impact is anticipated. Final results are forthcoming.

U. NOISE

INTRODUCTION AND METHODOLOGY

Noise pollution in an urban area comes from many sources. Some are activities essential to the health, safety, and welfare of the City's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, stem from the movement of people and goods, activities that are essential to the viability of the City as a place to live and do business. Although these and other noise-producing activities are necessary to a city, the noise they produce is undesirable. Urban noise detracts from the quality of the living environment and there is increasing evidence that excessive noise represents a threat to public health.

Under the Avenue V Pumping Station and Force Mains project, there is the potential for increased ambient noise levels near the Avenue V Pumping Station from the operation of mechanical equipment. Since the station would be unmanned, there would be no regular employee traffic to the site in the future (which is a net reduction in on-street traffic since the facility currently has staff). Consequently, the noise analysis focuses on examining noise levels near the Avenue V Pumping Station due to operation of mechanical equipment.

Noise impacts associated with construction activities are discussed in Section V, "Construction." No assessment is performed for the force mains since it would be entirely underground and, therefore, would not result in any potential significant adverse noise impacts during operations.

NOISE FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may adversely affect people in several ways. For example, noise may interfere with human activities, such as sleep, speech communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. Although it is possible to study these effects on people on an average or statistical basis, it must be remembered that all the stated effects of noise on people vary greatly with the individual. Several noise scales and rating methods are used to quantify the effects of noise on people. These scales and methods consider such factors as loudness, duration, time of occurrence, and changes in noise level with time.

NOISE MEASUREMENT

A number of factors affect sound, as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and

changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels. Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to correspond to human hearing. A measurement system that simulates the response of the human ear, the "A-weighted sound level" or "dBA," is used in view of its widespread recognition and its close correlation with human judgment of loudness and annoyance. In the current study, all measured levels are reported as A-weighted decibels or dBAs. Sound levels for typical daily activities are shown in Table U-1.

**Table U-1
Common Noise Levels**

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	80
Busy city street, loud shout	80
Busy traffic intersection	70
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas or residential areas close to industry	50
Background noise in an office	50
Suburban areas with medium density transportation	40
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0
<p>Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.</p> <p>Source: Cowan, James P. Handbook of Environmental Acoustics. Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.</p>	

Although sound levels from a sound level meter are generally given in dBA, measurements are sometimes made in octave band format. An octave band is one of a series of bands that cover the normal range of frequencies included in sound measurements. Such octave bands serve to define the sound in term of its pitch components. Octave band levels are "unweighted" levels corresponding to the overall acoustical energy in the corresponding octave band.

RESPONSE TO CHANGES IN NOISE LEVELS

The average ability of an individual to perceive changes in noise levels is well documented (see Table U-2). Generally, changes in noise levels less than 3 dBA are barely perceptible to most listeners, whereas 10 dBA changes are normally perceived as doublings (or halvings) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels. Noise affects people in terms of individual reactions to specific effects, such as interference with speech, sleep, and other activities.

Table U-2
Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A "dramatic change"
40	Difference between a faintly audible sound and a very loud sound
Source: Bolt Beranek and Neuman, Inc., <i>Fundamentals and Abatement of Highway Traffic Noise</i> , Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.	

STATISTICAL NOISE LEVELS

Since dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods are needed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period, as if it had been a steady, unchanging sound. For this condition, a descriptor called the equivalent sound level, L_{eq} can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, $L_{eq(1)}$, or 24 hours, $L_{eq(24)}$, conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1 , L_{10} , L_{50} , L_{90} , and L_x are sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90 and x percent of the time, respectively. Discrete event peak levels are given as L_{01} levels. L_{eq} is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50} . The relationship between L_{eq} and exceedance levels has been used in the current studies to characterize the noise sources and to determine the nature and extent of their impact at all receptor locations.

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

For the purposes of this project, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in the noise impact evaluation. $L_{eq(1)}$ is the noise

descriptor used in the City Environmental Quality Review (CEQR) standards for vehicular traffic noise and cumulative impact evaluation. Hourly statistical noise levels were used to characterize the relevant noise sources and their relative importance at each receptor location.

NOISE STANDARDS AND CRITERIA

NEW YORK CITY NOISE CODE

The New York City Noise Control Code promulgates sound-level standards for motor vehicles, air compressors, and paving breakers, requires that all exhausts be muffled, and prohibits all unnecessary noise adjacent to schools, hospitals, or courts. The code further limits construction activities to weekdays between 7 AM and 6 PM. This Code contains ambient noise quality criteria and standards based on existing land use zoning designations. Table U-3 summarizes the ambient noise quality criteria contained in the Noise Code. Conformance with the noise level values contained in the Code is determined by considering noise emitted directly from stationary activities within the boundaries of a project. Construction activities and noise sources outside the boundaries of a project are not included within the provisions of this law.

Table U-3
City of New York Ambient Noise Quality Zone Criteria (dBA)

Ambient Noise Quality Zone (ANQZ)	Daytime Standards* (7 AM-10PM)	Nighttime Standards* (10 PM-7AM)
Noise quality zone N-1 (Low density residential R _L ; land-use zones R-1 to R-3)	60	50
Noise quality zone N-2 (High density residential R _H ; land-use zones R4 to R10)	65	55
Noise quality zone N-3 (All commercial and manufacturing land-use zones)	70	70
Note: * L _{eq} (1 hour).		
Source: City of New York Local Law No. 64.		

NEW YORK CEQR NOISE STANDARDS

The New York City Department of Environmental Protection (NYCDEP) has set external noise exposure standards. These standards are shown in Table U-4. Noise Exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The standards shown are based on maintaining an interior noise level for the worst-case hour L₁₀ less than or equal to 45 dBA. Mitigation requirements are shown in Table U-5.

ANALYSIS YEAR

The future analysis year for purposes of determining operational noise is 2012, the year construction would be completed.

IMPACT DEFINITION

For purposes of impact assessment, the proposed project will have a significant noise impact if the *CEQR Technical Manual* relative noise criteria is exceeded due to project operation (i.e., the total noise generated by all mechanical equipment). The *CEQR Technical Manual* impact criteria are listed below.

Table U-4
Noise Exposure Guidelines
For Use in City Environmental Impact Review

Receptor Type	Time Period	Acceptable General External Exposure	Airport ³ Exposure	Marginally Acceptable General External Exposure	Airport ³ Exposure	Marginally Unacceptable General External Exposure	Airport ³ Exposure	Clearly Unacceptable General External Exposure	Airport ³ Exposure
1. Outdoor area requiring serenity and quiet ²		$L_{10} \leq 55$ dBA	$L_{dn} \leq 60$ dBA ----- $L_{dn} \leq 75$ dBA						
2. Hospital, Nursing Home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA	$65 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA		
3. Residence, residential hotel or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$(1) 65 < L_{dn} \leq 70$ dBA, (II) $70 \leq L_{dn}$	$L_{10} > 80$ dBA		
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA		
4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		
		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		
5. Commercial or office		Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)				
		Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)				
6. Industrial, public areas only ⁴	Note 4	Note 4	Note 4	Note 4	Note 4				

Notes:

(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more.

¹ Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.

² Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheatres, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.

³ One may use the FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.

⁴ External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Source: New York City Department of Environmental Protection (adopted policy 1983).

Table U-5

Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Acceptable	Marginally Unacceptable		Clearly Unacceptable		
Noise Level With Proposed Action	$65 < L_{10} \leq 70$	$70 < L_{10} \leq 75$	$75 < L_{10} \leq 80$	$80 < L_{10} \leq 85$	$85 < L_{10} \leq 90$	$90 < L_{10} \leq 95$
Attenuation*	25 dB(A)	(I) 30 dB(A)	(II) 35 dB(A)	(I) 40 dB(A)	(II) 45 dB(A)	(III) 50 dB(A)
Note:	* The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All the above categories require a closed window situation and hence an alternate means of ventilation.					
Source:	New York City Department of Environmental Protection					

- An increase of 5 dBA in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the baseline, if the 2012 baseline levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the 2012 baseline condition, if the 2012 baseline levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the 2012 baseline condition, if the 2012 baseline noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR standards as being between 10 PM and 7 AM.)

Since this assessment addresses the potential maximum impacts on adjacent uses for operations, and the facility would be operating 24 hours per day, analyses were performed during the quietest hours (between 10 PM and 7 AM), and the significant impact threshold applied is 3 dBA $L_{eq(1)}$.

NOISE PREDICTION METHODOLOGY

To determine potential noise impacts from stationary sources at the Avenue V Pumping Station, the analysis included the following procedure:

- Determine receptor locations at the closest sensitive land uses within the adjacent study area where the maximum project noise levels would be likely to occur;
- Measure the existing ambient noise levels at the closest sensitive land uses within the adjacent study area;
- Determine individual equipment sound power noise levels based on available data and published material;
- Determine the location of individual equipment on the project sites;
- Estimate noise attenuation due to building structures and enclosures, contract specifications and other factors;
- Calculate noise levels at the sensitive receptor locations using attenuation correction terms; and
- Compare calculated noise levels with standards and existing ambient noise levels.

For the Avenue V Pumping Station, the closest sensitive receptor locations are the Marlboro Houses and private houses across the street from the project site. Figure 23 depicts the location of nearby sensitive noise receptor locations.

Plant equipment lists were prepared for the Avenue V Pumping Station. These lists included the number of operating units and the sound power levels generated by each piece of equipment. Equipment considered to generate significant noise levels included the emergency generator, emergency generator inlets and exhaust stacks, pumps, exhaust fans and transformers. This equipment was then located in a three-dimensional coordinate system relative to the planned facility layout and location of nearby, off-site sensitive receptor locations.

Octave band sound pressure levels, L_p , at receptor sites were calculated based on sound power levels using the following formula:

$$L_p = L_w - A_{div} - A_{atm} - A_{ground} - A_{screen} - A_{TL} - A_D - 0.6$$

where:

L_w is the point source sound power level, in dB re 1 picowatt;

A_{div} is the attenuation due to geometrical divergence;

A_{atm} is the attenuation due to atmospheric absorption;

A_{ground} is the attenuation due to the ground effects;

A_{screen} is the attenuation due to screening;

A_{TL} is the attenuation due to sound transmission loss due to building partition (for equipment located inside a structure only); and

A_D is the attenuation due to acoustical design features.

Sound power levels were determined based on data from manufacturers, published material, and professional experience with similar equipment. Where sufficient information was available regarding potential equipment, manufacturers were contacted and information on expected sound pressure levels was requested. In many cases the data were available. In cases where either the manufacturer could not provide specific information, or sufficient detailed information regarding the equipment were not available, data from the literature^{**} and other sources for similar equipment were used. The analysis conservatively depicted the sound pressure levels for several of the project components including the generator and transformers.

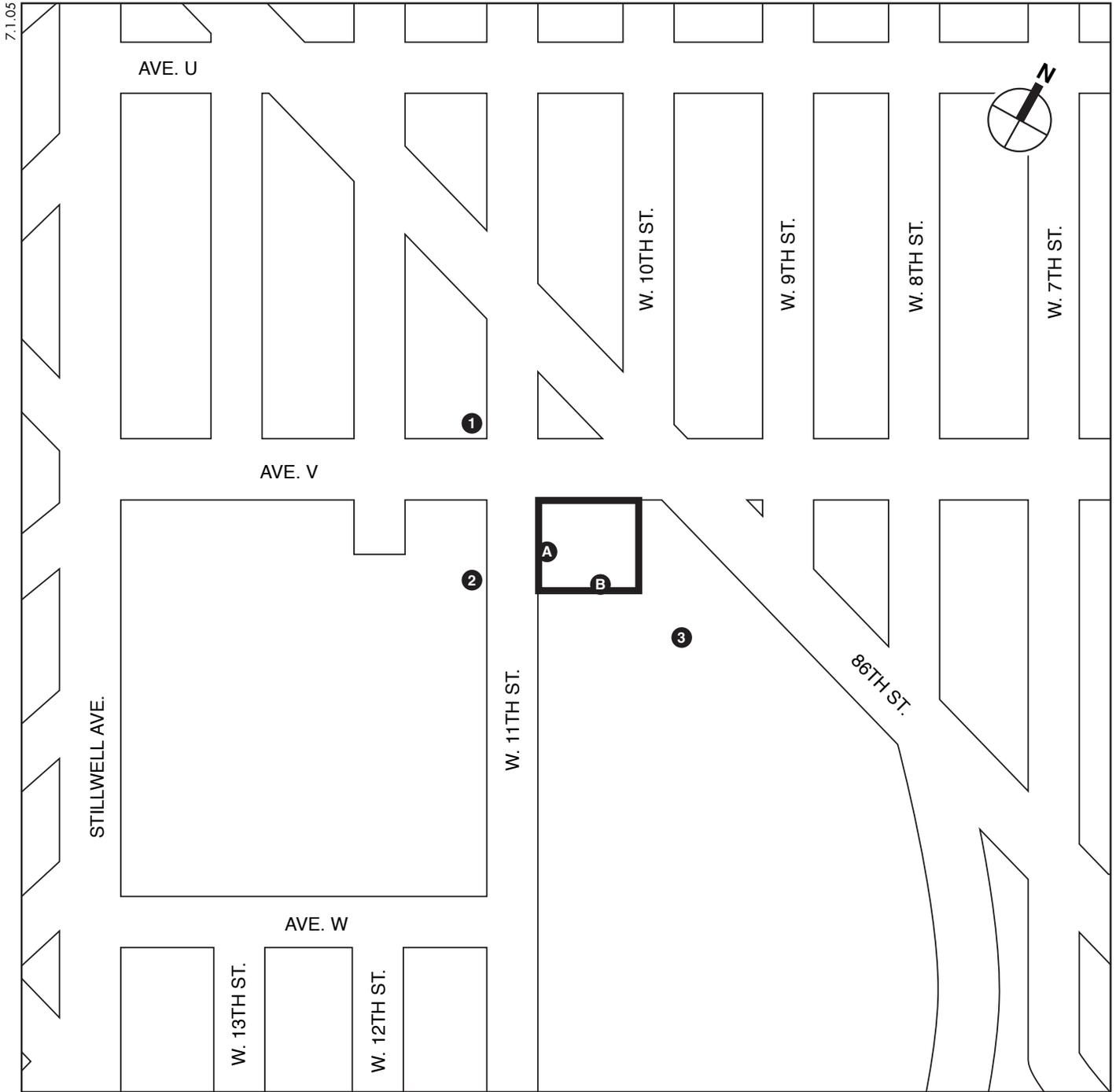
The analysis included the following: attenuation due to geometrical divergence, attenuation due to absorption in the air, attenuation due to ground effects (i.e., for hard ground absorption), attenuation due to shielding or obstructions, and attenuation due to sound transmission loss due to building partitions, and attenuation due to acoustical design features, such as silencers.

Attenuation levels from acoustical devices (silencers) that would be included on the emergency generator inlet and exhaust stacks at the Avenue V Pumping Station were based on attenuation levels included in the contract specifications.

To account for the loss in sound power for equipment located within enclosed structures, noise attenuation factors were applied. For units enclosed within fixed structures (such as an

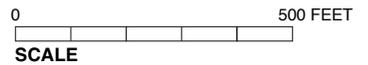
* Electric Power Plant Environmental Noise Guide, Edison Electric Institute, 1984

** Noise and Vibration Control for Mechanical and Electrical Sources in Buildings, Laymon Miller, 1974



Proposed Avenue V Pumping Station

- A** 24 Hour Monitoring
- 1** Sensitive Receptor Monitoring



LOCATIONS

- 1** Residential - 2-Story
- 2** Residential Marlboro Houses
- 3** Residential Marlboro Houses

emergency generator or sewage pumps), attenuation factors less than those expected from the enclosure were employed in the analysis. Noise attenuation equivalent to a 4" solid lightweight masonry units reported in Noise Control Manual for Residential Buildings (David A. Harris, 1997) were employed for internal equipment. For the mobile emergency generator, the attenuation from noise control in the contract specifications (i.e., acoustical panels that require minimal transmission losses by octave band) were employed in this analysis.

For any other equipment, either in the open or within a structure but with an opening to the outside (e.g., vents) a factor of "zero" was employed. Reductions in sound power due to the "loss of line of sight" to the receptor were also included in the analysis.

The noise levels at receptor locations were calculated using distance correction terms and attenuation. Total stationary source noise levels at each receptor site were determined by adding the contribution from each piece of equipment and comparing the projected increase in the noise levels at sensitive receptor locations to the applicable impact criteria. For this analysis, the contributions of noise levels at off-site receptor locations from existing operations at the Avenue V Pumping Station were not included, and thus, the incremental noise levels projected are conservatively high.

EXISTING CONDITIONS

SITE DESCRIPTION

The predominant land use in the vicinity of the Avenue V Pumping Station is residential. The pumping station is adjacent to the Marlboro Houses, and nearby there are also low density residential structures. Other land uses in the vicinity of the pumping station include commercial and retail, automotive uses, and open space. The site is zoned R5, and is within an N2 Ambient Noise Quality Zone (ANQZ). $L_{eq(1)}$ noise level limits for this type of zone are 65 dBA for daytime (7 AM to 10 PM) and 55 dBA for nighttime (10 PM to 7 AM) hours. Traffic is the dominant noise source, but the adjacent and nearby streets have relatively low traffic volumes.

SELECTION OF NOISE RECEPTOR LOCATIONS

Three noise receptor sites were selected for stationary noise analysis. The selected receptor sites are residences either immediately adjacent or across the street from the project site (see Figure 23). These sites were chosen for noise analysis because they are the nearest sensitive receptors to the project site and have the highest potential for significant impacts. (No receptor sites were selected for traffic analysis, because there would be no significant changes in traffic due to the project.)

NOISE MONITORING

Noise monitoring was performed on-site for 24-hour periods (in order to provide information on relative noise levels in the study area throughout the day), and during overnight/early morning and mid-afternoon timeframes at the nearby sensitive receptors. The 24-hour monitoring was conducted over two full days at sites A and B (on Figure 22) on June 14th through June 16th, 2005. At the sensitive receptor sites (sites 1 through 3 in Figure 22), twenty-minute measurements were made on June 16th, during two time periods—the overnight/early morning period AM (5:00 to 6:00 AM), and midday (12:00 Noon to 1:00 PM), time periods.

EQUIPMENT USED

Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq} , $L_{eq(1)}$, L_{10} , L_{50} , L_{90} , L_{min} , and L_{max} . A windscreen was used during all sound measurements except for calibration. This procedure was used in all noise monitoring, and valid acoustical data were obtained under acceptable weather and street surface conditions.

The instrumentation used for the continuous 24-hour noise measurements was a Brüel & Kjær Noise Level Analyzer Type 4427, a Brüel & Kjær Sound Level Calibrator Type 4231, a Brüel & Kjær ½-inch microphone Type 4189, and a Brüel & Kjær microphone preamplifier Type 2669. The Analyzer was calibrated before and after readings with a Brüel & Kjær Type 4231 sound-level calibrator using the appropriate adaptor. Measurements at the location were made on the A-scale (dBA). The data were digitally recorded by the Analyzer and displayed at the end of the measurement period (i.e., 60 minutes) in units of dBA. Measured quantities included L_{eq} , L_1 , L_{10} , L_{50} , and L_{90} . A windscreen was used during all sound measurements, except for calibration. Acoustical data were obtained under acceptable weather and street surface conditions. For the 24-hour measurements, the instrumentation was placed in an auto parked at the Avenue V pump station and the microphone was placed on the car antenna, extending into the air. For each 24-hour measurement period, the car was placed near one of the property lines.

The instrumentation used for the 20-minute measurements at sensitive receptor sites was a Larson David Labs (LDL) Model MK224 microphone connected to an LDL preamplifier attached to an LDL Model 700 Type 1 (according to ANSI Standard S1.4-1983) sound level meter. The instrument was mounted at a height of 4 feet above the ground on a tripod. The meter was calibrated before and after readings with a Brüel & Kjær Type 4230 sound level calibrator using the appropriate adaptor. The data were digitally recorded by the noise analyzer and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq} , L_1 , L_{10} , L_{50} , and L_{90} . A windscreen was used during all sound measurements except for calibration. Only traffic related noise was measured at the sensitive receptor sites; noise from other sources (e.g. emergency sirens, aircraft flyovers, etc.) was excluded from the measured noise levels at the sensitive receptor sites. However, since the 24-hour monitoring was done unattended, it could have included the effect of such sources.

Weather conditions for the recordings at sensitive receptors were noted to ensure a true reading as followed: wind speed under 12 mph; relative humidity under 90 percent; and temperature above 14°F and below 122°F. All measurement procedures conformed with the requirements of ANSI Standard S1.13-1971 (R1976).

RESULTS OF MEASUREMENTS

Baseline 24-hour measurements at the two on-site monitoring locations are presented in Tables U-6 and U-7. The lowest L_{eq} noise levels (recorded during the overnight/early morning hours) were 55.9 dBA at Site 1, 56.3 dBA at Site 2, and 53.0 dBA at Site 3. In terms of CEQR guidance levels, the noise levels at both sites are considered to be in the “marginally acceptable” range.

THE FUTURE WITHOUT THE PROPOSED ACTION

No significant changes in operations equipment or traffic are expected to occur at the Avenue V Pumping Station No Action conditions. Consequently, conditions without the proposed action would be comparable to existing conditions.

Table U-6
24-Hour Measured Noise Levels
Site A
(in dBA) Avenue V Pumping Station

Hour Starting	L _{eq(1)}	L ₁	L ₁₀	L ₅₀	L ₉₀
9:00:00 AM	63.6	71.7	66.0	62.0	59.2
10:00:00 AM	63.9	71.4	65.7	62.5	59.8
11:00:00 AM	64.5	71.5	66.9	63.3	60.1
12:00:00 PM	64.9	73.1	67.0	63.5	60.4
1:00:00 PM	68.6	79.1	69.0	65.8	61.3
2:00:00 PM	68.5	75.6	69.8	67.9	65.4
3:00:00 PM	62.6	72.7	64.3	59.6	57.5
4:00:00 PM	60.1	68.2	61.9	58.8	56.5
5:00:00 PM	61.5	67.8	61.8	59.2	57.3
6:00:00 PM	60.0	64.6	61.6	59.4	57.7
7:00:00 PM	59.8	65.3	61.3	58.8	56.8
8:00:00 PM	59.6	65.3	61.1	58.8	57.2
9:00:00 PM	60.1	66.3	61.5	59.2	57.5
10:00:00 PM	59.4	63.8	60.7	59.0	57.6
11:00:00 PM	60.3	63.7	61.9	60.0	58.0
12:00:00 AM	59.3	63.8	61.3	58.5	56.9
1:00:00 AM	58.4	63.1	59.6	57.9	56.4
2:00:00 AM	58.1	61.5	59.1	57.4	55.9
3:00:00 AM	58.7	61.1	59.8	58.4	56.8
4:00:00 AM	58.7	62.5	59.9	58.5	56.9
5:00:00 AM	58.9	65.4	60.0	58.2	56.5
6:00:00 AM	61.7	69.7	63.7	60.0	57.9
7:00:00 AM	66.0	72.7	67.8	65.1	60.9
8:00:00 AM	67.8	76.0	69.3	66.6	64.4
Note: Field measurements were performed on June 14th/15th 2005.					

PROBABLE IMPACTS OF THE PROPOSED ACTION

DEP is working on the conclusion of the noise modeling analysis. However, no potential for significant impact is anticipated. Finals results are forthcoming.

CONCLUSION

The proposed Avenue V Pumping Station and Force Mains project would not result in any potential significant noise impacts.

V. CONSTRUCTION IMPACTS

Outlined below is a summary of the overall construction schedule, a description of the major construction work elements and the evaluation of potential construction impacts.

Table U-7
24-Hour Measured Noise Levels
Site B
(in dBA) Avenue V Pumping Station

Start time	LA _{eq}	L ₁	L ₁₀	L ₅₀	L ₉₀
3:00:00 PM	58.8	64.9	59.9	58.0	56.4
4:00:00 PM	58.0	63.6	59.4	57.4	55.9
5:00:00 PM	58.2	64.3	59.5	57.5	56.0
6:00:00 PM	57.1	60.8	58.4	56.8	55.5
7:00:00 PM	57.1	61.8	58.4	56.7	55.4
8:00:00 PM	58.6	66.4	59.2	56.7	55.1
9:00:00 PM	56.7	61.9	58.1	56.1	54.7
10:00:00 PM	56.4	61.6	57.5	55.6	54.5
11:00:00 PM	55.5	59.7	56.8	55.0	53.4
12:00:00 AM	55.2	59.5	56.7	54.8	53.3
1:00:00 AM	55.8	62.4	56.2	54.5	53.2
2:00:00 AM	54.4	58.1	55.6	54.0	53.0
3:00:00 AM	53.4	56.6	54.3	52.9	52.3
4:00:00 AM	53.3	59.5	54.0	52.6	51.9
5:00:00 AM	53.6	58.1	54.6	53.2	52.2
6:00:00 AM	56.9	64.9	58.4	55.6	53.9
7:00:00 AM	58.0	66.0	59.8	56.4	55.0
8:00:00 AM	59.5	67.5	60.4	57.2	55.3
9:00:00 AM	62.3	70.5	64.6	57.9	56.0
10:00:00 AM	57.1	66.5	57.5	55.5	54.3
11:00:00 AM	59.7	68.4	63.1	56.9	55.2
12:00:00 PM	57.6	64.0	59.1	56.6	55.2
1:00:00 PM	58.7	65.9	60.2	57.5	55.9
2:00:00 PM	56.8	58.4	57.8	56.9	55.4
Note:	Field measurements were performed on June 15th/16th 2005.				

CONSTRUCTION SCHEDULE

Construction activity for the proposed project would be divided into two components: pumping station construction and force main construction. The proposed project's construction phases would be conducted to permit project completion in a timely manner. Project construction is estimated to occur over a 6-year period. The Avenue V Pumping Station reconstruction is estimated to take 54 months, beginning in the third quarter of 2005 and finishing in the fourth quarter of 2009. Almost all of the work would be contained within the boundaries of the pumping station. The only work outside of the station would be the connection in the bed of Avenue V. Force main construction is expected to occur over a 54-month period, scheduled to begin in the third quarter of 2007 and end in the fourth quarter of 2011. As discussed further below, this construction would move continuously as the force mains are installed. No one area of the force main routes would be subject to construction for an extensive period of time.

MAJOR CONSTRUCTION WORK ELEMENTS

AVENUE V PUMPING STATION RECONSTRUCTION

During the reconstruction of the Avenue V Pumping Station, the contractor would be required to maintain operation of the pumping station, which would involve the installation of some temporary facilities and pumps. Therefore, any new pipelines, pumps or other equipment would have to be installed and tested before the old equipment could be taken out of service.

The exterior construction work at the site would occur during the first 15 months of construction. However, the bulk of the work would be underground and involve the disconnecting and reconnecting of piping. The two work items that could be the most noticeable to the surrounding community would be the construction of the wet well extension and the deepening of the wet well by 3.5 feet.

The construction steps and the maintenance of operation of the sewers within the property and in Avenue V are described below. The construction of the wet well extension would occur in step two, and the pouring of the concrete could last one to two months. The deepening of the wet well would occur in step four and could take up to three months for both the demolition and the reconstruction.

Exterior Construction Elements (Initial 15 months)

First Stage (approximately 1 ½ months)

- remove tanks,
- install and test temporary pumps (system A) in regulator AV-1,
- disconnect and plug various sewer lines, and
- install dewatering wells and pumps

Second Stage (approximately 5 months)

- construct bypasses,
- remove existing interceptor sewer,
- construct an extension to the wet well and install bypasses,
- disconnect and plug various sewer lines,
- install and test temporary pumps (systems B and C), and
- demolish storage building

Third Stage (approximately 1 ½ months)

- install new bypasses and retain walls,
- divert flows from wet well and into wet well extension,

Fourth Stage (approximately 3 ⅓ months)

- Remove plugs and reconnect certain sewer lines,
- remove temporary system A, and
- Demolish pump room, wet well building and switchboard room

Fifth Stage (approximately 3 ⅓ months)

- Demolish and equipment room removal in Main Building,
- Remove bulkheads to new wet well,

- install new equipment,
- remove all temporary pumps

After approximately 15 months, all exterior work would be completed, and almost all of the remaining work related to the Avenue V Pumping Station Reconstruction would be inside the Main Building, except for landscaping at the very end of the construction phase for the Avenue V facility. Work would occur during normal working hours defined in New York City's noise code. A maximum of 20 construction workers on-site during would be expected for any extended time period. In addition, measures to reduce short-term odor impacts during construction, such as, manholes would be covered during construction before sewage is released into them.

During the entire 15 month period, the temporary pumping systems would be in operation. Temporary submersible pumps would be in operation, and the potential impacts of such units (such as on ambient noise levels) and the construction components of the project are described in the *Evaluation of Construction Impacts* discussion below.

FORCE MAINS INSTALLATION

Two methods of installing the force mains methods would be used. In order to minimize potential environmental impacts, approximately 6,800 linear feet of force mains under City streets would be installed using microtunneling technology. Along Shore Parkway, generally open trenching and direct burial of the force main would be employed except at the entrance ramps where microtunneling would be used to minimize disruption to traffic.

MICROTUNNELING

The microtunneling technique involves excavating jacking or receiving pits up to 900 feet apart or wherever the force mains make turns. For the two side-by-side force mains, the pits would be about 20 feet by 20 feet. For the approximately 1,800 feet along Bay 16th Street to regulator 9A, where only the wet weather force main would be installed, the pits would be about 10 foot wide by 20 foot long. For a pit spacing with 900 feet, excavation and preparation for a period of about 2 to 5 weeks would occur at any one pit location used to jack pipe. Types of equipment to be utilized would include backhoes, track excavator, concrete truck, control booth, settling tanks, crane, pump chamber, slurry pumper, generator, hydraulic pump and ram, pipe and sheeting delivery trucks, and tunnel boring machine (TBM). The duration of time for the installation of microtunnelled pipe along a 900 foot segment would be approximately 2 weeks. As the TBM goes, slurry pumps would pump water around the head of the TBM, and pump away the excavated soil to the settling chamber for removal or the soil would be removed by a conveyor screw and buckets. As the force main pipes are installed, polymer and bentonite lubrication would be pumped around the spaces between the pipes and the soils to lubricate the hydraulic pushing process. Manholes or closure pieces would be installed in the pit to complete the installation. This would take approximately 7 weeks for a 900 foot segment of microtunnelled pipe to be completed before backfilling. After the pipe is installed, it would take approximately 2 weeks to fill the pit, and replace the asphalt street surface.

When a force main would cross the ramps to and from Shore Parkway (e.g., Bay Parkway, Bay 8th Street,) and the Verrazano Narrows Bridge, microtunneling would be employed.

The disadvantage of microtunneling is that it is often more expensive than open trenching and requires more sophisticated construction techniques. The advantages of microtunneling include

less disruption to the surrounding areas and the force main could be installed deeper, avoiding sensitive areas and potential contamination.

OPEN TRENCHING

Open trenching (aka cut and cover) involves excavating an open trench about 4 feet wider than the size of the force mains plus the distance between them. After the trench is excavated, a geotechnical fabric is placed to provide soil stability. A bedding layer of gravel is put in the bottom of the trench and the force mains would be laid. Gravel is then placed around the force mains, and finally the soil is replaced and compacted to the original grade. There would be a minimum of 4 feet of cover above the top of the force mains. At locations where open trenching construction techniques are envisioned, no long term disruptions to traffic flow along the Belt Parkway are expected.

EVALUATION OF CONSTRUCTION IMPACTS

Short-term adverse environmental impacts could occur during the construction period (of both the Avenue V Pumping Station Reconstruction and force mains installation). These potential impacts, discussed below, would not occur after completion of the construction and operation of the project.

NEIGHBORHOOD CHARACTER

An assessment of the potential for construction-related impacts on neighborhood character focuses on the nature and duration of the construction activity. Construction activity would be expected to temporarily disrupt the residential neighborhood character of the surrounding area. Temporary adverse impacts on neighborhood character would result from construction-related activity, particularly with respect to construction traffic, air quality, and noise, but would be of limited duration. Construction activities would generate a small amount of vehicular traffic. In terms of air quality, methods for dust containment and erosion control, described below under “Air Quality,” would minimize localized fugitive dust impacts. Noise impacts would be from typical construction activity (no blasting is proposed). Hours of activity would be restricted as per the City code to reduce the daily duration of impact. Due to the temporary nature of construction activities on neighborhood character, this impact would not be considered significant.

Construction activity—including construction-related noise from trucks and the operation of equipment—would not be expected to occur on any one local street block for a period of more than a week or two. At locations where microtunnel pits are located, construction activities may last at such for locations for 1 to 2 months. Locating most of the force main routes along the Shore Parkway would minimize the project’s construction impacts on neighborhood character. At no time would access to a neighborhood be completely cut off during construction on local streets, although limitations in lane openings, on-street parking, and access to small streets for other than local traffic could occur for brief periods in conjunction with construction on a given block.

SOCIOECONOMIC CONDITIONS

With the employment of microtunneling techniques, the proposed project would not entail construction of a long duration that would affect the access to, and therefore the viability of, nearby businesses. Therefore, there would be no significant adverse socioeconomic impacts from the construction of the project.

COMMUNITY FACILITIES

Construction of the proposed project would not disrupt services of community facilities, change facility entrances, or result in the temporary closure of any community facilities. Three community facilities are located along the proposed force main route: Lafayette High School at 2630 Benson Avenue, a vocational trade school at 2214 Stillwell Avenue, and Precious Blood Parochial School at 133 27th Avenue. Access to Lafayette High School and the vocational trade school would not be affected, as their primary entrances are on Benson and Stillwell Avenues, respectively. The primary entrance to the Precious Blood Parochial School is located on 27th Avenue; however, because force main construction would require only a lane or a partial street closing of 27th Avenue, access to the school would only be somewhat limited during the short duration of construction on that block. It is expected that the construction period at each of these facilities would only be approximately 1 to 2 weeks.

OPEN SPACE

Open spaces in the vicinity of the construction of the proposed project would not be used for construction-related activities (e.g., construction staging), nor would access to open space in the area be impeded as a result of the proposed project. Measures for replacements of trees after construction are discussed above under “Natural Resources”. Construction activities may have a temporary impact on the quality of the recreational experience at open spaces in the area due to increased noise associated with construction activity. At each of the affected open spaces, the construction activity would be about 1 week.

HISTORIC AND ARCHAEOLOGICAL RESOURCES

The potential construction activity impacts measures to minimize impacts on historic and archaeological resources and are discussed above under “Historic and Archaeological Resources.” The vibrations from the construction activity are not expected to be strong enough to have a significant effect on any historic structures along the force main routes.

The Fort Hamilton Officers’ Club (Casemate Fort) at Whiting Quadrangle in Fort Hamilton has been designated as a landmark by LPC and is listed on the S/NR. The Casemate Fort is a granite structure built between 1825 and 1831, and is an impressive example of 19th century military architecture. The Casemate Fort is located at the northwesternmost corner of Fort Hamilton. The installation of the proposed force main would border Fort Hamilton in this area, but would not be located on the property of the fort itself. The proposed force main route would be located along the northern shoulder of the Shore Parkway. A westbound on-ramp to the Verrazano-Narrows Bridge, and a 24-inch gravity sewer servicing Fort Hamilton would be located between the proposed force main trench and the Casemate Fort. The proposed force main would not be proximate to the Casemate Fort (350 feet, which is much greater than the 60 foot guideline risk criteria). With the proposed measures incorporated into the design and construction elements of the project, no significant adverse impacts on historic and archaeological resources are expected.

TRAFFIC AND TRANSPORTATION

Construction activities would generate a small amount of traffic during the peak hours. A maximum of 20 construction workers on-site during would be expected for any extended time period.. Based on observations of the area in the immediate vicinity of the pumping station, there is sufficient capacity on the local streets to accommodate this small and temporary increase in traffic. In addition, most of the trips would not coincide with the traditional commuter peak travel hours, because workers usually arrive at the construction site between 7:00 and 7:30 AM

and leave between 3:00 and 3:30 PM, and truck trips occur at intervals throughout the day. This would further diminish the likelihood of any noticeable increase in traffic congestion during the construction period as residents travel to and from work. In addition, the project study area is served locally by mass transit, which will reduce the number of construction workers that arrive by auto.

As described above under *Major Construction Work Elements*, construction of the force mains would not occur at the same location for extended periods of time. While the design of the construction documents for the force mains are not finalized, short-term lane closings could occur on Shore Parkway. Force main construction would have short-term adverse effects on local traffic associated with lane or partial street closings on local street blocks directly affected by construction activity, temporary suspension of parking on directly affected local street blocks, detours at several (as yet undetermined) intersections, and a possible lane closing on the Shore Parkway in the immediate vicinity of construction activity. Along Shore Parkway, lane closures would be limited to 10:00 AM to 2:00 PM during normal work days. Lane closures on Shore Parkway would not be allowed on the work days preceding and following a holiday weekend.

Microtunneling techniques would be applied at entrance and exit ramps to and from the Shore Parkway and for ramps to the Verrazano Narrows Bridge that may be encountered on the force main paths. Under the current design, a temporary ramp would be employed at the westbound entrance to the Verrazano-Narrows Bridge from the Shore Parkway. As the design progresses, consultations will be held with NYCDOT to address potential short-term disruptions to traffic flow, and attempts will continue to be made to reduce the need (if any) for short-term closure of travel lanes.

AIR QUALITY

Mobile Source and Heavy Equipment Emissions

Potential construction impacts on local air quality include mobile source emissions (including hydrocarbons, nitrogen oxide, and carbon monoxide) from three sources: additional construction vehicle trips in the area, local traffic diversions near construction sites, and heavy equipment operations at the construction site. Impacts from carbon monoxide emission tend to be localized. Due to the limited number of additional construction-generated vehicles, emissions from these sources are not expected to add significant pollutant concentrations that would impact local air quality. Heavy equipment construction vehicles would also not be a major source of carbon monoxide, since most construction equipment is diesel-powered and emits relatively low amounts of carbon monoxide. Larger sized diesel equipment will need to abide by the recently enacted New York City local law 77, which will require the use of ultra low sulfur fuel and Best Available Technology for diesel equipment greater than 50 horsepower on-site. Likewise, local increases in hydrocarbons and nitrogen oxide due to construction activities are not expected to be significant.

Fugitive Dust

Fugitive dust emissions can occur from excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. The volume of fugitive dust is dependent on the extent and nature of the clearing operations, the kind of equipment employed, the physical characteristics of the underlying soil, the speed at which construction vehicles are operated, and the type of fugitive dust-control methods employed. The proposed project would require excavation, site grading, and repaving or re-landscaping. Most of this activity would occur in or adjacent to residential areas. However, much of the fugitive dust generated by

construction activities consists of relatively large-size particles that settle to the ground a short distance from the activity itself.

Because fugitive dust is a common impact of construction, it is regulated under the City's code. During construction, all appropriate fugitive dust-control measures—including watering exposed areas and using dust covers for trucks—must be used to satisfy Section 1402.2-9.11 of the New York City Air Pollution Code. To prevent fugitive dust from becoming airborne, the measures include:

- Use of water or surfactant to control dust in the construction operations and during the clearing and grading of land;
- Application of water to dirt paths, materials, stockpiles, and other surfaces that can generate airborne dust over extended periods. Construction of temporary roads would be built with properly sized stone or concrete equivalent over filtering material;
- Covering of open-body trucks transporting materials likely to generate airborne dust at all times when in motion; and
- Prompt removal of earth or other material from paved streets where earth or other material has been deposited by trucking or earth-moving equipment, erosion by water, or other means.

NOISE

Construction activity generates noise and vibration from construction equipment, construction vehicles, worker traffic, and delivery vehicles traveling to and from the construction sites. With regard to noise impacts during construction, construction operations for the proposed project would be limited to the City's imposed time restrictions, and all equipment used for construction of the proposed project would meet the sound-level standards contained in the New York City Local Law No. 64 noise code. If any special construction activities fall outside the provisions of this restriction due to reasons of safety, special variances would be required and the contractor would be responsible for attaining any variances needed. There are no historic structures that would be at risk of vibration-induced damage in the area of pavement breaking operations associated with this project.

As described above under *Major Construction Work Elements*, much of the construction work for the Avenue V Pumping Station will occur indoors. In addition, during the first 15 months of construction for the Avenue V Pumping station, much of the work will be underground. The temporary pumps utilized while construction of the new wet well is underway would be electric, and are not expected to be significant sources of noise. Mini-piles that are installed on-site will be augured, and this activity would occur for about one month. With such measures in place, no significant adverse construction noise impacts from the Avenue V Pumping Station reconstruction would occur.

For the installation of the force mains, the location of construction will change over time as the construction along the route progresses. Construction activity on the force main would be sequenced so that no one area would be affected for a long period of time. Construction of the force main is estimated to progress at an estimated average rate of 100 feet per day, or 500 feet per week. Actual progress would be affected by a number of factors, including subsurface obstructions, soils encountered, and weather conditions. Homes or schools could be disturbed by construction noise for approximately 1 week (Monday through Friday), but could be affected for a slightly longer time period at the microtunneling locations. Noise would not be continuous but intermittent throughout the work day.

Based on the above, no significant adverse noise impacts would occur during construction of the project.

NATURAL RESOURCES

The force main would be within various streets and roadways until it reaches the northern shoulder of the Shore Parkway. Street trees, including large London planetrees (*Platanus acerifolia*) and black oaks (*Quercus velutina*), would largely be unaffected. The proposed width of the trench along the Shore Parkway would range from 9 to 15 feet and extend for approximately 18,310 feet. However, the majority of this expanse is composed of mowed lawn area (*Gramineae sp.*), most likely Kentucky bluegrass (*Poa pratenses*) and other grasses identified as orchard grass (*Dactylis glomerata*) and redtop (*Agrostis alba*). Woody vegetation occurs only sporadically within the grassed area, primarily along the fence farthest from the highway, and would be unaffected.

In addition, much of the expanse east and south of Fort Hamilton contains an asphalt pathway. Shrubs and trees would need to be removed to facilitate placement of the force main. These would most likely include privet (*Ligustrum vulgare*), pitch pine (*Pinus rigida*), tree-of-heaven (*Ailanthus*), and mature black oaks or London planetrees. Other herbaceous and woody species listed in the vegetation survey, notably non-native invasive vines, such as greenbriar (*Smilax rotundifolia*), could also be removed with the project. However, no species noted in the survey are listed as protected by State or Federal law. All are quite common examples of roadside vegetation as well as remnant upland and ornamental trees.

The “Natural Resources” discussion provides more details on the expected number of trees and vegetation that would be lost during construction. NYCDEP will continue to work with the New York City Department of Parks and Recreation to reach an agreement on a tree replacement planting plan that will be developed and implemented as part of the construction documents for the project. For at least 2 years after construction, a weekly watering schedule during the growing season (April to October) will be included as part of the transplant plan.

INFRASTRUCTURE

According to the *CEQR Technical Manual*, construction-related infrastructure impacts would occur if project construction would disrupt infrastructure service for extended or intermittent periods over a long period of time. The proposed project would not interrupt wastewater conveyance and treatment service. During the period that the pumping station would be upgraded, interim pumping would be provided by a general construction contractor at a design capacity of 30 mgd, equal to the capacity of the existing pumping station. In addition, efforts will be made to minimize impacts on existing utilities in the construction area.

HAZARDOUS MATERIALS

The proposed project would entail the demolition of four structures and reconstruction of an existing building on the Avenue V Pumping Station, and the disturbance and excavation of soils along the proposed force main route. The proposed demolition and construction at the Avenue V Pumping Station would disturb confirmed asbestos-containing materials, lead-based paint, and lead-jointed pipes. There is also the possibility of contamination from soils associated with a neighboring facility with a history of releases. During construction activities, any contaminated soils or groundwater, asbestos-containing materials, or lead-based paint compounds would be handled in accordance with all applicable State and Federal regulations.

The construction of the force main would require the excavation of soil, which would increase the exposure pathways for any chemical constituents that may be found in the soils and groundwater along the proposed route. One sample taken during the borings had lead levels that have the characteristics of hazardous waste. Further testing found not additional evidence of the presence of hazardous waste. All excavated material would be removed and disposed of by a specialty contractor in accordance with all applicable laws and regulations. The removal would be completed prior to the general contractor working in that area. To prevent impacts to workers and nearby residents, all excavation and construction work involving soil disturbance will be performed under an environmental construction health and safety plan (CHASP) to assure that the construction workers, the surrounding community, and the environment are not adversely affected by the construction activities.

For additional information, see “Hazardous Materials,” above.

DEWATERING

Avenue V Pumping station

The elevation of the new wet well would be about 3.5 feet lower than the existing wet well so that the additional wet weather flow could be accommodated and pumped into the new wet weather force main. In order to construct the new wet well, the excavation would have to be dewatered. The site has an existing ground water elevation about 2 feet above Brooklyn Borough Datum, which approximates the mean high tide, and the bottom of the concrete slab for new wet well would be about 26 feet below Brooklyn Borough Datum. Therefore, the groundwater in the vicinity of wet well would be drawn down about 30 feet. Based on the construction, this draw down of the groundwater table could last for about two years.

As part of the construction contract, NYCDEP would specify measures to reduce dewatering flow and the time required for dewatering. These measures would include dewatering to the full extent only when deep excavation is taking place, rather than full dewatering over the complete construction period. Another measure would be limiting the area being dewatered to those areas undergoing active construction.

In order to dewater, NYCDEP would have to obtain a Long Island well permit from NYSDEC because the flow rate would be greater than 45 gpm, the threshold for needing a permit. NYSDEC would review the need for the well and its potential impact on other wells in the area used for drinking water. In order to provide more complete data to NYSDEC, NYCDEP would have the construction contractor operate a test well for about a week. The test well would allow the contractor to detail the number and location of the dewatering wells and to refine the estimate of flow.

A detailed hydrogeological analysis has been undertaken to determine how to accomplish the dewatering and what potential impacts it may have. The area of the pumping station had been shoreline and marsh that was filled in the beginning of the 20th century. Therefore the top layers of the underlying soils are fill over organic materials, often referred to as meadow mat. Below those layers are sandy glacial outwash sediments. This layer is over one hundred feet thick and allows groundwater to flow freely. The direction of the groundwater flow is generally towards Gravesend Bay and the Atlantic Ocean.

Based on the soil conditions, the analysis determined that the pumping rate needed to accomplish the dewatering would be about 2,000 gallons per minute (gpm). The draw down of the groundwater forms an inverted cone shape with the deepest point at the extraction wells and radiating out conically in three dimensions as the groundwater is draw into the well. The furthest

extent of the draw down cone is estimated at about 2,500 feet. Beyond that distance, the dewatering would have no effect. When the groundwater is extracted, the ground above it can subside. Within the cone, the maximum ground subsidence is estimated to be 2 to 3 inches. The nearby Marlboro Houses buildings are supported on piles, which are designed to resist settlement. Within the area of subsidence, the subsidence on streets, sidewalks and areas with light buildings would be uniform and would not be noticeable to most people. This type of subsidence would not damage buildings, utilities or roadways. NYCDEP would have the contractor repair any damaged connection.

The groundwater in the area is not used for drinking water. Some non-potable users of the groundwater, such as car washes, may exist. Outside of the cone of influence, these users would be unaffected. If a non-potable water user is located within the cone of influence, the well may be affected if it is very shallow. The well depth would have to be less than 30 feet right next to the Avenue V Pumping Station and even shallower further away from the site. Because of natural fluctuations in the groundwater levels, it is highly unlikely that any production well would be located that shallow. In addition, the groundwater level would return quickly to its original levels after the dewatering operation ceases.

This groundwater would be discharged into the sewer pipes downstream of the pumping station and would be conveyed into Coney Island Creek. Investigations into nearby sources of pollution have not found any unremediated spills that would contaminate the groundwater. Therefore, the groundwater in this area is not considered to be contaminated and would not have an adverse impact on the surface waters of Coney Island Creek.

Force Main Dewatering

The installation of the force mains would also require dewatering. Under the City streets, the force mains would be installed using microtunneling techniques. Microtunneling requires dewatering only small areas, primarily the jacking and receiving pits. Any one area would be dewatered for only a short period of time. This water would be pumped into City sewers and conveyed to the Owls Head WPCP. Because of the small area being dewatering, the cone of influence is small, and no subsidence is expected from the dewatering.

Along Shore Parkway, the construction technique would be open cut and cover, where a trench is dug, bedding materials placed in the trench, the pipelines installed, and closing the trench. Because of the proximity to Gravesend Bay and the depth of the force mains, the groundwater level would have to be lowered by up to 15 feet. This would involve extensive dewatering that could be discharged to local sewers.

CONCLUSIONS

Based on the analysis above and the measures that already have been or will be incorporated into future construction documents, no significant adverse impacts from construction of the project are expected.

W. PUBLIC HEALTH

The project is a proposed water quality improvement project, which would re-convey CSO from Coney Island Creek to the Verrazano Narrows. Water quality assessments indicated that the proposed project would result in water quality improvements in Coney Island Creek and not result in significant adverse impacts on water quality or coliform levels at the nearest public beaches. Therefore, no significant adverse public health impacts are expected from the proposed project.

As described in Section M, “Hazardous Materials”, to prevent impacts to workers and nearby residents, all excavation and construction work at the Avenue V Pumping Station and along the force main routes involving soil disturbance will be performed under an environmental construction health and safety plan (CHASP) to assure that the construction workers, the surrounding community, and the environment are not adversely affected by the construction activities. Therefore, no significant adverse public health impacts are expected from the construction or operation of the proposed project. *