New York City
Department of Environmental Protection

PROPOSED ENVIRONMENTAL DREDGING OF FLUSHING BAY

PER ADMINISTRASTIVE ORDER OF CONSENT (CO2-20110512-25)

ENVIRONMENTAL ASSESSMENT STATEMENT

December 2012

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Flushing Bay Enviromental Assessment Statement Full Form

Attachment A: Enviromental Assessment Statement

Attachments

List of Tables

City Environmental Quality Review
ENVIRONMENTAL ASSESSMENT STATEMENT FULL FORM
Please fill out, print and submit to the appropriate agency (see instructions)

PART I: GENERAL INFORMATION

PROJECT NAME

1. *Reference Numbers*

CEQR REFERENCE NUMBER (To Be Assigned by Lead Agency)	BSA REFERENCE NUMBER (If Applicable)
13DEP012Q	
ULURP REFERENCE NUMBER (If Applicable)	OTHER REFERENCE NUMBER(S) (If Applicable) (e.g., Legislative Intro, CAPA, etc.)

2a. *Lead Agency Information*

NAME OF LEAD AGENCY: **NYC Department of Environmental Protection**

NAME OF LEAD AGENCY CONTACT PERSON: **Ms. Angela Licata, Deputy Commissioner**

ADDRESS: **59-17 Junction Blvd, 11th Floor**

CITY: **Flushing** STATE: **NY** ZIP: **11373**

TELEPHONE: **(718) 595-4352** FAX: **(718) 595-4479**

EMAIL ADDRESS: **AngelaL@dep.nyc.gov**

2b. *Applicant Information*

NAME OF APPLICANT: **NYC Department of Environmental Protection**

NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON: **Ms. Kathryn Mallon, Deputy Commissioner**

ADDRESS: **96-05 Horace Harding Expwy, 4th Fl Low Rise**

CITY: **Corona** STATE: **NY** ZIP: **11373**

TELEPHONE: **(718) 595-6183** FAX: **(718) 595-5999**

EMAIL ADDRESS: **KMallon@dep.nyc.gov**

3. *Action Classification and Type*

SEQRA Classification

■ UNLISTED ☐ TYPE I; SPECIFY CATEGORY *(see 6 NYCRR 617.4 and NYC Executive Order 91 of 1977, as amended):*

Action Type *(refer to Chapter 2, "Establishing the Analysis Framework" for guidance)*

■ LOCALIZED ACTION, SITE SPECIFIC ☐ LOCALIZED ACTION, SMALL AREA ☐ GENERIC ACTION

4. *Project Description:*

The NYC Department of Environmental Protection (DEP) proposes to dredge and remove approximately 85,000-cubic yards (cy) of material along the southwest shore of Flushing Bay in the vicinity of the World's Fair Marina. No subaqueous capping is proposed within the Bay after the completion of dredging. The removal of the dredged material is required by a Consent Order with the New York State Department of Environmental Conservation (NYSDEC) that requires the DEP to remove accumulated sediment mounds deposited by combined sewer overflows (CSOs) in Flushing Bay. See EAS Section A for complete project description.

4a. *Project Location: Single Site* *(for a project at a single site, complete all the information below)*

ADDRESS: **Flushing Bay, in the vicinity of the World's Fair Marina south of the breakwater on the southern edge of the Bay**

NEIGHBORHOOD NAME: **Flushing**

TAX BLOCK AND LOT: **Not Applicable** BOROUGH: **Queens** COMMUNITY DISTRICT: **3 and 7**

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS

Within Flushing Bay, at the World's Fair Marina, bounded to the west and south by the bay shoreline and the Flushing Bay promenade of Flushing Meadows-Corona Park, to the northwest by LaGuardia Airport, and to the southeast by Pier 1 of the World's Fair Marina (see Figure B-1).

EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION, IF ANY: **R3-2** ZONING SECTIONAL MAP NO: **16c**

4b. *Project Location: Multiple Sites* *(Provide a description of the size of the project area in both City Blocks and Lots. If the project 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 of the project, including bounding streets, etc.)*

Not Applicable

5. *REQUIRED ACTIONS OR APPROVALS* *(check all that apply)*

City Planning Commission: YES ☐ NO ■

- ☐ CITY MAP AMENDMENT
- ☐ ZONING MAP AMENDMENT
- ☐ ZONING TEXT AMENDMENT
- ☐ UNIFORM LAND USE REVIEW PROCEDURE (ULURP)
- ☐ CONCESSION
- ☐ UDAAP
- ☐ REVOCABLE CONSENT
- ☐ ZONING CERTIFICATION
- ☐ ZONING AUTHORIZATION
- ☐ HOUSING PLAN & PROJECT
- ☐ SITE SELECTION—PUBLIC FACILITY
- ☐ FRANCHISE
- ☐ DISPOSITION—REAL PROPERTY

ZONING SPECIAL PERMIT, SPECIFY TYPE

- ☐ MODIFICATION OF
- ☐ RENEWAL OF

Board of Standards and Appeals: YES ☐ NO ■

- ☐ SPECIAL PERMIT

EXPIRATION DATE MONTH DAY YEAR

- ☐ VARIANCE (USE)
- ☐ VARIANCE (BULK)

SPECIFY AFFECTED SECTION(S) OF THE ZONING RESOLUTION

☐ OTHER

Department of Environmental Protection: YES ■ NO ☐

Other City Approvals: YES ■ NO ☐

☐ LEGISLATION	☐ RULEMAKING
■ FUNDING OF CONSTRUCTION; SPECIFY **DEP**	☐ CONSTRUCTION OF PUBLIC FACILITIES
☐ POLICY OR PLAN; SPECIFY	☐ FUNDING OR PROGRAMS; SPECIFY
☐ LANDMARKS PRESERVATION COMMISSION APPROVAL (not subject to CEQR)	■ PERMITS; SPECIFY **See Table A-2 of Section A.**
☐ 384(B)(4) APPROVAL	☐ OTHER; EXPLAIN
☐ PERMITS FROM DOT"S OFFICE OF CONSTRUCTION MITIGATION AND COORDINATION (OCMD) (*not subject to CEQR*)	

6. ***State or Federal Actions/Approvals/Funding:*** YES ■ NO ☐ IF "YES," IDENTIFY

See Table A-2 of Section A

7. ***Site Description:*** Except where otherwise indicated, provide the following information 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.

GRAPHICS *The following graphics must be attached and each box must be checked off before the EAS is complete. Each map must clearly depict the boundaries of the directly affected area or areas, and indicate a 400-foot radius drawn from the outer boundaries of the project site. Maps may not exceed 11x17 inches in size and must be folded to 8.5x11 inches for submission.*

■ Site location map ■ Zoning map ■ Photographs of the project site taken within 6 months of EAS submission and keyed to the site location map

■ Sanborn or other land use map ■ Tax map ■ For large areas or multiple sites, a GIS shape file that defines the project sites

PHYSICAL SETTING *(both developed and undeveloped areas)*

Total directly affected area (sq. ft.):	Type of waterbody and surface area (sq. ft.):	Roads, building and other paved surfaces (sq. ft.):
731,800 sf (16.8 acres)	**Tidal Embayment**	**N/A**

Other, describe (sq. ft.):

8. ***Physical Dimensions and Scale of Project*** *(if the project affects multiple sites, provide the total development below facilitated by the action)*

Size of project to be developed: **Not Applicable** (gross sq. ft.)

Does the proposed project involve changes in zoning on one or more sites? YES ☐ NO ■

If „Yes," identify the total square feet owned or controlled by the applicant: **N/A** Total square feet of non-applicant owned development: **N/A**

Does the proposed project involve in-ground excavation or subsurface disturbance, including but not limited to foundation work, pilings, utility lines, or grading? YES ■ NO ☐

If „Yes," indicate the estimated area and volume dimensions of subsurface disturbance (if known):

Area: **731,800 sf** sq. ft. (width x length) Volume: **2,295,000 (85,000 cy)** cubic feet (width x length x depth)

Does the proposed project increase the population of residents and/or on-site workers? YES ☐ NO ■ Number of additional residents? **0** Number of additional workers? **0**

Provide a brief explanation of how these numbers were determined:

Following completion of the proposed project, there will be no additional permanent residents or workers.

Does the project create new open space? YES ☐ NO ■ If Yes: (sq. ft)

Using Table 14-1, estimate the project"s projected operation solid waste generation, if applicable: **N/A** (pounds per week)

Using energy modeling or Table 15-1, estimate the project"s projected energy use: **N/A** (annual BTUs)

9. ***Analysis Year*** *CEQR Technical Manual, Chapter 2*

ANTICIPATED BUILD YEAR (DATE THE PROJECT WOULD BE COMPLETED AND OPERATIONAL):	ANTICIPATED PERIOD OF CONSTRUCTION IN MONTHS:
2018 (See Section A).	**Less than 24-months**

WOULD THE PROJECT BE IMPLEMENTED IN A SINGLE PHASE? YES ■ NO ☐ IF MULTIPLE PHASES, HOW MANY PHASES:

BRIEFLY DESCRIBE PHASES AND CONSTRUCTION SCHEDULE: **See Section A.**

10. ***What is the Predominant Land Use in Vicinity of Project?*** *(Check all that apply)*

■ RESIDENTIAL ☐ MANUFACTURING ■ COMMERCIAL ■ PARK/FOREST/OPEN SPACE ☐ OTHER, Describe: **See Figure B-9.**

DESCRIPTION OF EXISTING AND PROPOSED CONDITIONS

The information requested in this table applies to the directly affected area. The directly affected area consists of the project site and the area subject to any change in regulatory control. The increment is the difference between the No-Action and the With-Action conditions.

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Land Use				
Residential	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following				
No. of dwelling units				
No. of low- to moderate-income units				
No. of stories				
Gross Floor Area (sq. ft.)				
Describe Type of Residential Structures				
Commercial	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following:				
Describe type (retail, office, other)				
No. of bldgs				
GFA of each bldg (sq. ft.)				
Manufacturing/Industrial	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following:				
Type of use				
No. of bldgs				
GFA of each bldg (sq. ft.)				
No. of stories of each bldg.				
Height of each bldg				
Open storage area (sq. ft.)				
If any unenclosed activities, specify				
Community Facility	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following				
Type				
No. of bldgs				
GFA of each bldg (sq. ft.)				
No. of stories of each bldg				
Height of each bldg				
Vacant Land	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, describe				
Publicly Accessible Open Space	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify type (mapped City, State, or Federal Parkland, wetland—mapped or otherwise known, other)				
Other Land Use	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, describe				
Parking				
Garages	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Attended or non-attended				

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Parking *(continued)*				
Lots	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Other (includes street parking)	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, describe				
Storage Tanks				
Storage Tanks	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If yes, specify the following:				
Gas/Service stations:	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	
Oil storage facility:	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	
Other; identify:	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐	
If yes to any of the above, describe:				
Number of tanks				
Size of tanks				
Location of tanks				
Depth of tanks				
Most recent FDNY inspection date				
Population				
Residents	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If any, specify number				
Briefly explain how the number of residents was calculated				
Businesses	Yes ☐ No ■	Yes ☐ No ■	Yes ☐ No ■	
If any, specify the following:				
No. and type				
No. and type of workers by business				
No. and type of non-residents who are not workers				
Briefly explain how the number of businesses was calculated				
Zoning*				
Zoning classification	**R3-2**	**No Change**	**No Change**	
Maximum amount of floor area that can be developed (in terms of bulk)	**0.5 residential uses (0.6 with attic bonus)**	**No Change**	**No Change**	
Predominant land use and zoning classification within a 0.25-radius of proposed project	**Residential with Commercial Overlays and Open Space.**	**No Change**	**No Change**	

Attach any additional information as may be needed to describe the project.

If your project involves changes in regulatory controls that affect one or more sites not associated with a specific development, it is generally appropriate to include the total development projections in the above table and attach separate tables outlining the reasonable development scenarios for each site.

**This section should be completed for all projects, except for such projects that would apply to the entire city or to areas that are so extensive that site-specific zoning information is not appropriate or practicable.*

PART II: TECHNICAL ANALYSES

INSTRUCTIONS: For each of the analysis categories listed in this section, assess the proposed project"s impacts based on the thresholds and criteria presented in the *CEQR Technical Manual*. Check each box that applies.

- If the proposed project can be demonstrated not to meet or exceed the threshold, check the „NO" box.
- If the proposed project will meet or exceed the threshold, or if this cannot be determined, check the „YES" box.
- For each „Yes" response, answer the subsequent questions for that technical area and consult the relevant chapter of the *CEQR Technical Manual* for guidance on providing additional analyses (and attach supporting information, if needed) to determine whether the potential for significant impacts exists. Please note that a „Yes" answer does not mean that EIS must be prepared—it often only means that more information is required for the lead agency to make a determination of significance.
- The lead agency, upon reviewing Part II, may require an applicant to either provide additional information to support the Full EAS Form. For example, if a question is answered „No," an agency may request a short explanation for this response.

		YES	NO
1.	***LAND USE, ZONING AND PUBLIC POLICY:*** *CEQR Technical Manual, Chapter 4 21* ***(see Section B, "Land Use, Zoning and Public Policy.")***		
(a)	Would the proposed project result in a change in land use or zoning that is different from surrounding land uses and/or zoning? Is there the potential to affect an applicable public policy? If "Yes," complete a preliminary assessment and attach.		✓
(b)	Is the project a large, publicly sponsored project? If „Yes," complete a PlaNYC assessment and attach.		✓
(c)	Is any part of the directly affected area within the City"s Waterfront Revitalization Program boundaries? If „Yes," complete the Consistency Assessment Form.	✓	
2.	***SOCIOECONOMIC CONDITIONS:*** *CEQR Technical Manual, Chapter 5 21* ***(see Section C, "Socioeconomic Conditions.")***		
(a)	Would the proposed project:		
	• Generate a net increase of 200 or more residential units?		✓
	• Generate a net increase of 200,000 or more square feet of commercial space?		✓
	• Directly displace more than 500 residents?		✓
	• Directly displace more than 100 employees?		✓
	• Affect conditions in a specific industry?		✓
(b)	If „Yes" to any of the above, attach supporting information to answer the following questions, as appropriate. If „No" was checked for each category above, the remaining questions in this technical area do not need to be answered.		
(1)	***Direct Residential Displacement***		
	If more than 500 residents would be displaced, would these displaced represent more than 5% of the primary study area population?		
	If „Yes," is the average income of the directly displaced population markedly lower than the average income of the rest of the study area population?		
(2)	***Indirect Residential Displacement***		
	Would the expected average incomes of the new population exceed the average incomes of the study area populations?		
	If „Yes," would the population increase represent more than 5% of the primary study area population or otherwise potentially affect real estate market conditions?		
	If „Yes," would the study area have a significant number of unprotected rental units?		
	Would more than 10 percent of all the housing units be renter-occupied and unprotected?		
	Or, would more than 5 percent of all the housing units be renter-occupied and unprotected where no readily observable trend toward increasing rents and new market rate development exists within the study area?		

		YES	NO
(3)	***Direct Business Displacement***		
	Do any of the displaced businesses provide goods or service that otherwise could not be found within the trade area, either under existing conditions or in the future with the proposed project?		
	Do any of the displaced businesses provide goods or services that otherwise could not be found within the trade area, either under existing conditions or in the future with the proposed project?		
	Or is any category of business to be displaced the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it?		
(4)	***Indirect Business Displacement***		
	Would the project potentially introduce trends that make it difficult for businesses to remain in the area?		
	Would the project capture the retail sales in a particular category of goods to the extent that the market for such goods would become saturated as a result, potential resulting in vacancies and disinvestment on neighborhood commercial streets?		
(5)	***Effects on Industry***		
	Would the project significantly affect business conditions in any industry or any category of businesses within or outside the study area?		
	Would the project indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?		
3.	***COMMUNITY FACILITIES:*** *CEQR Technical Manual, Chapter 6 21* ***(see Section A-1, "Screening Analysis.")***		
(a)	Would the project 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?		✓
(b)	Would the project exceed any of the thresholds outlines in Table 6-1 in Chapter 6?		✓
(c)	If „No" was checked above, the remaining questions in this technical area do not need to be answered. If „Yes" was checked, attach supporting information to answer the following, if applicable.		✓
(1)	***Child Care Centers***		
	Would the project result in a collected utilization rate of the group child care/Head Start centers in the study area that is greater than 100 percent?		
	If „Yes," would the project increase the collective utilization rate by 5 percent from the No-Action scenario?		
(2)	***Libraries***		
	Would the project increase the study area population by 5 percent from the No-Action levels?		
	If „Yes," would the additional population impair the delivery of library services in the study area?		
(3)	***Public Schools***		
	Would the project result in a collective utilization rate of the elementary and/or intermediate schools in the study area that is equal to or greater than 105 percent?		
	If „Yes," would the project increase this collective utilization rate by 5 percent from the No-Action scenario?		
(4)	***Health Care Facilities***		
	Would the project affect the operation of health care facilities in the area?		
(5)	***Fire and Police Protection***		
	Would the project affect the operation of fire or police protection in the area?		
4.	***OPEN SPACE:*** *CEQR Technical Manual, Chapter 7 21* ***(see Section D, "Open Space.")***		
(a)	Would the project change or eliminate existing open space?		✓
(b)	Is the project located within an underserved area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?		✓
(c)	If „Yes," would the proposed project generate more than 50 additional residents or 125 additional employees?		
(d)	Is the project located within a well-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?		✓
(e)	If „Yes," would the project generate more than 350 additional residents or 750 additional employees?		
(f)	If the project is not located within an underserved or well-served area, would it generate more than 200 additional residents or 500 additional employees?		✓
(g)	If „Yes" to any of the above questions, attach supporting information to answer the following: • Does the project result in a decrease in the open space ratio of more than 5%?		
	• If the project site is within an underserved area, is the decrease in open space between 1% and 5%?		
	• If „Yes," are there qualitative considerations, such as the quality of open space, that need to be considered?		

		YES	NO
5.	***SHADOWS:*** *CEQR Technical Manual, Chapter 8. 21* ***(see Section A-1, "Screening Analysis.")***		
(a)	Would the proposed project result in a net height increase of any structure of 50 feet or more?		✓
(b)	Would the proposed project result in any increase in structure height and be located adjacent to or across the street from a sunlight-sensitive resource?		✓
(c)	If „Yes" to either of the above questions, attach supporting information explaining whether the project"s shadow reach any sunlight-sensitive resource at any time of the year.		
6.	***HISTORIC AND CULTURAL RESOURCES:*** *CEQR Technical Manual, Chapter 9 21* ***(see Section A-1, "Screening Analysis.")***		
(a)	Does the proposed project site or an adjacent site contain any architectural and/or archaeological resource that is eligible for, or has been designated (or is calendared for consideration) as a New York City Landmark, Interior Landmark or Scenic Landmark; is listed or eligible for listing on the New York State or National Register of Historic Places; or is within a designated or eligible New York City, New York State, or National Register Historic District? If "Yes," list the resources and attach supporting information on whether the proposed project would affect any of these resources.		✓
7.	***URBAN DESIGN AND VISUAL RESOURCES:*** *CEQR Technical Manual, Chapter 10 21* ***(see Section A-1, "Screening Analysis.")***		
(a)	Would the proposed project introduce a new building, a new building height, or result in any substantial physical alteration to the streetscape or public space in the vicinity of the proposed project that is not currently allowed by existing zoning?		✓
(b)	Would the proposed project result in obstruction of publicly accessible views to visual resources that is not currently allowed by existing zoning?		✓
(c)	If "Yes" to either of the questions above, please provide the information requested in Chapter 10.		
8.	***NATURAL RESOURCES:*** *CEQR Technical Manual, Chapter 11 21* ***(see Section E, "Natural Resources.")***		
(a)	Is any part of the directly affected area within the Jamaica Bay Watershed? If "Yes," complete the Jamaica Bay Watershed Form.		✓
(b)	Does the proposed project site or a site adjacent to the project contain natural resources as defined in Section 100 of Chapter 11? If "Yes," list the resources: Attach supporting information on whether the proposed project would affect any of these resources.	✓	
9.	***HAZARDOUS MATERIALS:*** *CEQR Technical Manual, Chapter 12 21* ***(see Section F, "Hazardous Materials.")***		
(a)	Would the proposed project allow commercial or residential use in an area that is currently, or was historically, a manufacturing area that involved hazardous materials?		✓
(b)	Does the proposed project site have existing institutional controls (e.g., (E) designations or a Restrictive Declaration) relating to hazardous materials that preclude the potential for significant adverse impacts?		✓
(c)	Does the project require soil disturbance in a manufacturing zone or any development on or near a manufacturing zone or existing/historic facilities listed in Appendix 1 (including nonconforming uses)?		✓
(d)	Does the project result in the development of a site where there is reason to suspect the presence of hazardous materials, contamination, illegal dumping or fill, or fill material or unknown origin?		✓
(e)	Does the project result in development where underground and/or aboveground storage tanks (e.g., gas stations) are or were on or near the site?		✓
(f)	Does the project result in renovation of interior existing space on a site with potential compromised air quality, vapor intrusion from on-site or off-site sources, asbestos, PCBs or lead-based paint?		✓
(g)	Does the project result in development on or near a government-listed voluntary cleanup/brownfield site, current or former power generation/transmission facilities, municipal incinerators, coal gasification or gas storage sites, or railroad tracks and rights-of-way?		✓
(h)	Has a Phase I Environmental Site Assessment been performed for the site? If „Yes," were RECs identified? Briefly identify: No. See Section F, "Hazardous Materials" for additional information.	✓	
(i)	Based on a Phase I Assessment, is a Phase II Assessment needed?		✓
10.	***WATER AND SEWER INFRASTRUCTURE:*** *CEQR Technical Manual, Chapter 13 21* ***(see Section A-1, "Screening Analysis.")***		
(a)	Would the project result in water demand of more than one million gallons per day?		✓
(b)	Is the proposed project located in a combined sewer area and result in at least 1,000 residential units or 250,000 sq. ft. or more of commercial space in Manhattan or at least 400 residential units or 150,000 sq. ft. or more of commercial space in the Bronx, Brooklyn, Staten Island or Queens?		✓
(c)	Is the proposed project located in a separately sewered area and result in the same or greater development than that listed in Table 13-1 in Chapter 13?		✓
(d)	Does the proposed project involve development on a site five acres or larger where the amount of impervious surface would increase?		✓
(e)	Would the proposed project involve development on a site one acre or larger where the amount of impervious surface would increase and is located within the Jamaica Bay Watershed or in certain specific drainage areas including: Bronx River, Coney Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newtown Creek, or Westchester Creek?		✓
(f)	Would the proposed project be located in an area that is partially sewered or currently unsewered?		✓
(g)	Is the project proposing an industrial facility or activity that would contribute industrial discharges to a WWTP and/or generate contaminated stormwater in a separate storm sewer system?		✓
(h)	Would the project involve construction of a new stormwater outfall that requires federal and/or state permits?		✓
(i)	If "Yes" to any of the above, conduct the appropriate preliminary analyses and attached supporting documentation.		

		YES	NO
11. *SOLID WASTE AND SANITATION:* *CEQR Technical Manual, Chapter 14 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Would the proposed project have the potential to generate 100,000 pounds (50 tons) or more of solid waste per week?		✓
(b)	Would the proposed project involve a reduction in capacity at a solid waste management facility used for refuse or recyclables generated within the City?		✓
12. *ENERGY:* *CEQR Technical Manual, Chapter 15 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Would the proposed project affect the transmission or generation of energy?		✓
13. *TRANSPORTATION:* *CEQR Technical Manual, Chapter 16 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Would the proposed project exceed any threshold identified in Table 16-1 in Chapter 16?		✓
(b)	If "Yes," conduct the screening analyses, attach appropriate back up data as needed for each stage, and answer the following questions:		
	(1) Would the proposed project result in 50 or more Passenger Car Equivalents (PCEs) per project peak hour? If "Yes," would the proposed project result in 50 or more vehicle trips per project peak hour at any given intersection? **It should be noted that the lead agency may require further analysis of intersections of concern even when a project generates fewer than 50 vehicles in the peak hour. See Subsection 313 in Chapter 16 for more information.		
	(2) Would the proposed project result in more than 200 subway/rail or bus trips per project peak hour? If "Yes," would the proposed project result per project peak hour, in 50 or more bus trips on a single line (in one direction) or 200 subway trips per station or line?		
	(3) Would the proposed project result in more than 200 pedestrian trips per project peak hour? If "Yes," would the proposed project result in more than 200 pedestrian trips per project peak hour to any given pedestrian or transit element, crosswalk, subway stair, or bus stop?		
14. *AIR QUALITY:* *CEQR Technical Manual, Chapter 17 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	*Mobile Sources:* Would the proposed project result in the conditions outlined in Section 210 in Chapter 17?		✓
(b)	*Stationary Sources:* Would the proposed project result in the conditions outlined in Section 220 in Chapter 17? If „Yes," would the proposed project exceed the thresholds in the Figure 17-3, Stationary Source Screen Graph? (attach graph as needed)		✓
(c)	Does the proposed project involve multiple buildings on the project site?		✓
(d)	Does the proposed project require Federal approvals, support, licensing, or permits subject to conformity requirements?		✓
(e)	Does the proposed project site have existing institutional controls (e.g., (E) designations or a Restrictive Declaration) relating to air quality that preclude the potential for significant adverse impacts?		✓
(f)	If "Yes," conduct the appropriate analyses and attach any supporting documentation.		
15. *GREENHOUSE GAS EMISSIONS:* *CEQR Technical Manual, Chapter 18 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Is the proposed project a city capital project, a power plant, or would fundamentally change the City"s solid waste management system?		✓
(b)	If "Yes," would the proposed project require a GHG emissions assessment based on the guidance in Chapter 18?		
(c)	If "Yes," attach supporting documentation to answer the following; Would the project be consistent with the City"s GHG reduction goal?		
16. *NOISE:* *CEQR Technical Manual, Chapter 19 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Would the proposed project generate or reroute the vehicular traffic?		✓
(b)	Would the proposed project introduce new or additional receptors (see Section 124 in Chapter 19) near heavily trafficked roadways, within one horizontal mile of an existing or proposed flight path, or within 1,500 feet of an existing or proposed rail line with a direct line of sight to that rail line?		✓
(c)	Would the proposed project cause a stationary noise source to operate within 1,500 feet of a receptor with a direct line of sight to that receptor or introduce receptors into an area with high ambient stationary noise?		✓
(d)	Does the proposed project site have existing institutional controls (e.g., E-designations or a Restrictive Declaration) relating to noise that preclude the potential for significant adverse impacts?		✓
(e)	If "Yes," conduct the appropriate analyses and attach any supporting documentation.		
17. *PUBLIC HEALTH:* *CEQR Technical Manual, Chapter 20 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Would the proposed project warrant a public health assessment based upon the guidance in Chapter 20?		✓
18. *NEIGHBORHOOD CHARACTER:* *CEQR Technical Manual, Chapter 21* ***(see Section A-1, "Screening Analysis.")***			
(a)	Based upon the analyses conducted for the following technical areas, check „Yes" if any of the following technical areas required a detailed analysis: Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Open Space; Historic and Cultural Resources; Urban Design and Visual Resources; Shadows; Transportation; Noise.		✓
(b)	If "Yes," explain here why or why not an assessment of neighborhood character is warranted based on the guidance in Chapter 21, "Neighborhood Character." Attach a preliminary analysis, if necessary.		

19. *CONSTRUCTION IMPACTS:* *CEQR Technical Manual, Chapter 22* Would the project's construction activities involve (check all that apply): **See Section G, "Construction."**	YES	NO
• Construction activities lasting longer than two years;		✓
• Construction activities within a Central Business District or along an arterial or major thoroughfare;		✓
• Require closing, narrowing, or otherwise impeding traffic, transit or pedestrian elements (roadways, parking spaces, bicycle routes, sidewalks, crosswalks, corners, etc);		✓
• Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out;		✓
• The operation of several pieces of diesel equipment in a single location at peak construction;	✓	
• Closure of community facilities or disruption in its service;		✓
• Activities within 400 feet of a historic or cultural resource; or		✓
• Disturbance of a site containing natural resources.	✓	

If any boxes are checked, explain why or why not a preliminary construction assessment is warranted based on the guidance of in Chapter 22, "Construction." It should be noted that the nature and extent or any commitment to use the Best Available Technology for construction equipment or Best Management Practices for construction activities should be considered when making this determination.

See Section G, "Construction."

20. *APPLICANT'S CERTIFICATION*

I swear or affirm under oath and subject to the penalties for perjury that the information provided in this Environmental Assessment Statement (EAS) is true and accurate to the best of my knowledge and belief, based upon my personal knowledge and familiarity with the information described herein and after examination of pertinent books and records and/or after inquiry of persons who have personal knowledge or such information or who have examined pertinent books and records.

Still under oath, I further swear or affirm that I make this statement in my capacity as the

Deputy Commissioner (APPLICANT/SPONSOR) of **NYC Department of Environmental Protection** (NAME OF THE ENTITY OR OWNER)

the entity which seeks the permits, approvals, funding or other governmental action described in this EAS.

Check if prepared by: ☐ APPLICANT/REPRESENTATIVE or ☐ LEAD AGENCY REPRESENTATIVE (FOR CITY-SPONSORED PROJECTS)

Angela Licata
APPLICANT/SPONSOR NAME:

LEAD AGENCY REPRESENTATIVE NAME:

for A. Licata
SIGNATURE:

12/27/12
DATE:

PLEASE NOTE THAT APPLICANT MAY BE REQUIRED TO SUBSTANTIATE RESPONSES IN THIS FORM AT THE DISCRETION OF THE LEAD AGENCY SO THAT IT MAY SUPPORT ITS DETERMINATION OF SIGNIFICANCE.

PART III: DETERMINATION OF SIGNIFICANCE (To Be Completed by Lead Agency)

INSTRUCTIONS:

In completing Part III, the lead agency should consult 6 NYCRR 617.7 and 43 RCNY §6-06 (Executive Order 91 of 1977, as amended) which contain the State and City criteria for determining significance.

1. For each of the impact categories listed below, consider whether the project may have a significant effect on the environment. For each of the impact categories listed below, consider whether the project may have a significant adverse effect on the environment, taking into account its (a) location; (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude

IMPACT CATEGORY	Potential Significant Adverse Impact: YES	NO
Land Use, Zoning, and Public Policy		✓
Socioeconomic Conditions		✓
Community Facilities and Services		✓
Open Space		✓
Shadows		✓
Historic and Cultural Resources		✓
Urban Design/Visual Resources		✓
Natural Resources		✓
Hazardous Materials		✓
Water and Sewer Infrastructure		✓
Solid Waste and Sanitation Services		✓
Energy		✓
Transportation		✓
Air Quality		✓
Greenhouse Gas Emissions		✓
Noise		✓
Public Health		✓
Neighborhood Character		✓
Construction Impacts		✓

2. Are there any aspects of the project relevant to the determination whether the project may have a significant impact on the environment, such as combined or cumulative impacts, that were not fully covered by other responses and supporting materials? If there are such impacts, explain them and state where, as a result of them, the project may have a significant impact on the environment. — NO ✓

3. LEAD AGENCY'S CERTIFICATION

Deputy Commissioner
TITLE

Angela Licata
NAME

NYC Department of Environmental Protection
LEAD AGENCY

for A. Licata
SIGNATURE

☐ **Check this box if the lead agency has identified one or more potentially significant adverse impacts that MAY occur.**

☐ **Issue *Conditional Negative Declaration***

A ***Conditional Negative Declaration*** (CND) may be appropriate if there is a private applicant for an Unlisted action AND when conditions imposed by the lead agency will modify the proposed project so that no significant adverse environmental impacts would result. The CND is prepared as a separate document and is subject to the requirements in 6 NYCRR Part 617.

☐ **Issue *Positive Declaration* and proceed to a draft scope of work for the Environmental Impact Statement.**

If the lead agency has determined that the project may have a significant impact on the environment, and if a conditional negative declaration is not appropriate, then the lead agency issues a Positive Declaration.

NEGATIVE DECLARATION (To Be Completed By Lead Agency)

Statement of No Significant Effect

Pursuant to Executive Order 91 of 1977, as amended, and the Rules of Procedure for City Environmental Quality Review, found at Title 62, Chapter 5 of the Rules of the City of New York and 6NYCRR, Part 617, State Environmental Quality Review, the **[ ]** assumed the role of lead agency for the environmental review of the proposed project. Based on a review of information about the project contained in this environmental assessment statement and any attachments hereto, which are incorporated by reference herein, the **[ ]** has determined that the proposed project would not have a significant adverse impact on the environment.

Reasons Supporting this Determination

The above determination is based on information contained in this EAS that finds, because the proposed project:

No other significant effects upon the environment that would require the preparation of a Draft Environmental Impact Statement are foreseeable. This Negative Declaration has been prepared in accordance with Article 8 of the New York State Environmental Conservation Law (SEQRA).

TITLE	LEAD AGENCY
NAME	SIGNATURE

ATTACHMENT A

ENVIRONMENTAL ASSESSMENT STATEMENT

A. INTRODUCTION

This Environmental Assessment Statement (EAS) has been prepared to assess the potential environmental effects of proposed dredging activities within Flushing Bay, which is located in Queens, New York (see **Figure B-1**). The New York City Department of Environmental Protection (DEP) is proposing to dredge approximately 16.8 acres of Flushing Bay along the southwest shore in the vicinity of the World's Fair Marina (proposed project) in accordance with an Administrative Order of Consent (CO2-20110512-25) (CSO Consent Order) between DEP and the New York State Department of Environmental Conservation (NYSDEC). Sediment mounds have accumulated in Flushing Bay as a result of discharges of stormwater and untreated wastewater during wet weather events. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of combined sewer overflow (CSO) outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. The proposed project is also expected to encourage continued public use of waters. This EAS presents the technical analyses completed for the proposed project based on DEP's Flushing Bay Waterbody/Watershed Facility Plan (WWFP) and Final Basis of Design Report (BODR) and following the methodology set forth in the *City Environmental Quality Review (CEQR) Technical Manual* (2012).

Flushing Bay is a tidal embayment located south of the East River near the neighborhood of Flushing, Queens. The bay is bordered to the northwest by LaGuardia Airport, on the west and south by Flushing Meadows-Corona Park Promenade (waterfront promenade), and on the east by the College Point neighborhood. Flushing Bay is typically divided into two parts: the outer bay and the inner bay. The inner bay is subdivided by a manmade breakwater which extends southward from LaGuardia Airport and was constructed as a protective measure for the World's Fair Marina during storm events. The proposed project would occur within the inner bay, south of this breakwater on the southern edge of the bay. In this area, the entire length of the shoreline is stabilized by a riprap-armored embankment and bulkhead.

During the decades of industrial growth, Flushing Bay received untreated industrial wastes, raw sewage and surface water runoff, which has contributed to the continuous deposition of organic and inorganic sediments within the bay. In addition, throughout the early decades of the 1900s, natural wetlands in the vicinity of Flushing Bay were filled to accommodate the construction and expansion of water-dependent industrial, commercial and recreational land uses, including LaGuardia Airport and the World's Fair Marina. Three CSO outfalls—BB-006, BB-007, and BB-008—discharge to inner Flushing Bay within the proposed project area. These CSO outfalls convey both wastewater and stormwater to the bay during wet weather events and typically carry heavy sediment loads that, once released to the receiving waters, can settle near the outfalls and contribute to existing and historical deposition of organic and inorganic sedimentation. BB-006 and BB-008 comprise the majority of CSO volume, discharging approximately two billion gallons annually (see **Figure B-2**).The accumulation of these sediments over many decades has

contributed to impaired ambient air quality through the release of Hydrogen Sulfide (H_2S), an odor-causing constituent of CSOs.

Under the proposed project, dredging would be performed through the use of hydraulic and/or mechanical methods. Mechanical dredging would be used along the shoreline where hydraulic dredging is not feasible. All dredging activities would be water-based within the bay and adjacent to the waterfront. All materials needed to support the proposed project (work barges, disposal barges and dewatering facilities) would be transported to the dredge site or staging/dewatering site via barges and tugboats.

The anticipated duration of construction—including mobilization, active construction (dredging), wetland restoration and demobilization—would be a maximum of 24 months. The anticipated duration of the dredging portion of construction would be a maximum of 15 months. NYSDEC and United States Army Corp of Engineers (USACE) permit applications would be submitted in December 2012. The notice to proceed for the proposed project would be issued two years from the effective date of these permits, and the proposed project would be completed within five years from the date of these permits per the CSO Consent Order, which requires specific dredging-related milestones. For the purposes of this EAS, the build year is considered to be 2018.

The screening analysis to determine the areas requiring a detailed analysis in the EAS is provided in **Section A-1**. For detailed analyses, impact assessments were completed according to the methodologies of the *CEQR Technical Manual* (2012) and performed according to a three-step approach that includes (1) an inventory of the existing conditions; (2) determination of future conditions without the proposed project (No Action condition); and (3) an assessment of potential proposed project impacts (With Action condition). No Action conditions are projected for each technical analysis.

This EAS includes detailed analyses in the following technical areas:

- Land Use, Zoning, and Public Policy
- Socioeconomic Conditions
- Open Space
- Natural Resources
- Hazardous Materials
- Construction

PURPOSE AND NEED

The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. Historically, Flushing Bay received untreated industrial wastes, raw sewage and surface water runoff, which has contributed to the continuous deposition of organic and inorganic sediments within the bay. DEP is required by the 2012 Amended CSO Consent Order to perform environmental dredging to remove these existing sediment mounds in the vicinity of CSO outfalls BB-006 and BB-008 in Flushing Bay that are exposed at low tide and contribute to nuisance odors. DEP prepared the August 2011 Flushing Bay WWFP as the first step in the development of a CSO Long Term Control Plan (LTCP) for this waterbody. The WWFP identified a series of improvements aimed at achieving compliance with water quality standards. Specific objectives of the plan include eliminating odors, reducing floatables, and improving dissolved oxygen concentrations to meet surface water quality

standards. Environmental dredging of the bay is a nuisance odor reduction element of the WWFP. In addition to dredging, DEP's planned improvements in the WWFP include:

- Elevation of the regulator BB-R02 weir;
- Diversion of low-lying sewers;
- Regulator modifications;
- Continued implementation of programmatic controls; and
- Upgrades to the Bowery Bay Wastewater Treatment Plant.

EXISTING CONDITIONS

Flushing Bay is a tidal embayment located south of the East River near the neighborhood of Flushing, Queens. The bay is bordered to the northwest by LaGuardia Airport, on the west and south by the waterfront promenade, and on the east by the College Point neighborhood. Flushing Creek empties into the bay in the southeast corner. A 14-foot-deep, 150-foot-wide navigational channel extends the length of the bay and the majority of the shoreline is structurally stabilized with a riprap-armored embankment and bulkhead. Flushing Bay is tidal, and is defined by the outer bay and inner bay. The inner bay is defined by a manmade breakwater extending southward from LaGuardia Airport that was constructed in the 1960s as a protective measure for the World's Fair Marina (see **Figure B-1 and Figure B-3**). The proposed project would occur within the inner bay, south of this breakwater on the southern edge of the bay. In this area, the entire length of the shoreline is stabilized by a riprap-armored embankment and bulkhead.

Present land uses surrounding the bay consist primarily of open space, recreation, transportation and residential uses. Two New York City Department of Parks and Recreation (DPR) piers, Piers 2 and 3 (see **Figure B-4),** are part of the World's Fair Marina and located within the proposed project area**.** Pier 2 is largely deteriorated and unused and Pier 3 is an active DPR-operated marina. The marina is part of Flushing Meadows-Corona Park and includes a set of docks and moorings.

Immediately east of the proposed project area, DPR also operates Pier 1, which is a large, multi-purpose public pier that provides dockage for transient and excursion vessels, boating support services (e.g., gas dock), a seasonal water taxi service, public waterfront access for fishing and boating, and a café at the end of the pier. DPR's waterfront promenade extends from LaGuardia Airport 1.4 miles south and east to Flushing Creek, including approximately 2,250-feet along the entire proposed project area shoreline (see **Figure B-3**). Pier 3 is adjacent to outfall BB-008 (see **Figure B-2, bottom photograph**). The deteriorated Pier 2 is adjacent to outfall BB-006 (see **Figure B-2, top photograph**). Pier 3 provides about 200 recreational seasonal slips, along with winter storage facilities and a travel lift.

The nearest building to the proposed dredge area is the World's Fair Marina Restaurant and Banquet Hall, which fronts on Flushing Bay near Pier 3. The banquet hall is operated by a DPR vendor who caters private events. The nearest residence is approximately 430 feet south of the proposed project area on the opposite side of Grand Central Parkway.

In the late 1870s, a six-foot navigation channel was constructed in Flushing Bay extending from deep water in the East River inland to Flushing Creek in the area of the present-day Whitestone Expressway Bridge crossing. Subsequent to the construction of the navigation channel, the adjacent shoreline was rapidly developed with heavy industrial uses, such as construction, petroleum, coal, asphalt, and gravel and stone industries. In addition, throughout the early decades of the 1900s, natural wetlands in the vicinity of Flushing Bay were filled to accommodate the construction and expansion of water-dependent industrial, commercial and

recreational land uses, including LaGuardia Airport and the World's Fair Marina. As a result, the shoreline of Flushing Bay was significantly altered and is currently composed primarily of rip-rap, bulkhead, and marinas, although areas of natural, sand shoreline and natural, vegetated shoreline exist along the southern and western shorelines, between the piers within the World's Fair Marina and along the eastern boundary of LaGuardia Airport. Three types of wetlands also exist in this area: intertidal marsh, shoals and mudflats, and littoral zone.

Flushing Bay experiences a semi-diurnal tidal cycle with a vertical tidal range of approximately 6.8 feet. Significant portions of the inner bay along the western and southern shorelines are within the intertidal zone at MLLW and are exposed during low water conditions. Based on available sediment data, both historical and recent, there is considerable variability in sediment characteristics throughout Flushing Bay, but the bottom of Flushing Bay is generally characterized as mud/silt/clay with some areas of sand.

The physical modifications to the shoreline combined with deposition and discharges over time have degraded the ecological habitat value of Flushing Bay. Although DO levels are near or above the regulatory limit, the loss of extensive fringing wetlands, diverse natural shorelines, and benthic habitat suitable for colonization have substantially reduced biological diversity. An Essential Fish Habitat (EFH) Assessment was completed (**Attachment D**) and concluded that due to the existing water quality conditions and physical characteristics within Flushing Bay, many aquatic and benthic species would not be expected to occur in high densities within the proposed project area. In addition, the developed and modified shoreline adjacent to the proposed project area is a further limiting factor for species due to a lack of basic habitat needs.

PROPOSED PROJECT

Under the proposed project, approximately 16.8 acres of Flushing Bay would be dredged (**Figure B-3**). The proposed project has a dredge design depth of four feet below mean lower low water (MLLW) which would yield approximately 85,000 cubic yards (cy) of sediment removal. The post-dredge mudline in the proposed project area would be four feet below MLLW (-4 MLLW) at its shallowest, thereby removing sediments currently exposed at low tide. No subaqueous capping is proposed within Flushing Bay.

Sediment mounds have accumulated in Flushing Bay as a result of discharges of stormwater and untreated wastewater during wet weather events. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. Dredging would be performed through the use of hydraulic and/or mechanical methods. Mechanical dredging would be used along the shoreline where hydraulic dredging is not feasible. All dredging activities would be water-based within the bay and adjacent to the waterfront. All materials needed to support the proposed project (work barges, disposal barges and dewatering facilities) would be transported to the dredge site or staging/dewatering site via barges and tugboats.

Various measures for water quality protection and odor control during construction would be implemented under the proposed project. For example, a turbidity curtain constructed of filter fabric with folds to accommodate water elevation fluctuations would enclose the entire proposed project area to protect Flushing Bay waters from re-suspended sediments during construction. The curtain would be in place throughout the entire duration of construction and other best management practices would be employed, as applicable, to minimize effects to water quality.

Best management practices identified as conditions of the permits and required approvals would be implemented. To reduce dredging-related odors to the greatest extent practicable, a community air monitoring program (CAMP) would be implemented. The CAMP would be in place at the start of construction mobilization through demobilization and would enable the contractor to restrict or temporarily cease dredging activities on an as-needed basis. In addition, appropriate odor control measures, including neutralizing and foaming deodorizing agents, would be utilized under the CAMP. A wetland restoration plan would also be implemented to avoid impacts to tidal wetlands (see **Figure B-5**). The proposed restoration plan would enhance existing tidal wetland habitat along the shoreline and would offset potential disturbance to existing intertidal marsh and mudflats in the proposed project area. Wetland restoration and enhancement, in conjunction with the proposed removal of existing sediment mounds, would improve the wetland ecology of Flushing Bay.

The anticipated duration of construction—including mobilization, dredging, wetland restoration and demobilization—would be a maximum of 24 months. The anticipated duration of the dredging portion of construction would be a maximum of 15 months. NYSDEC and USACE permit applications would be submitted in December 2012. The notice to proceed for the proposed project would be issued two years from the effective date of these permits, and the proposed project would be completed within five years from the date of these permits per the CSO Consent Order, which requires specific dredging-related milestones.

The proposed project design was developed with the goal of minimizing and avoiding potential environmental and community impacts, including:

- Minimizing noise impacts;
- Minimizing odors;
- Providing bird protection/control;
- Maintaining public access;
- Limiting impacts to marina operations;
- Limiting construction duration ;
- Providing wetland protection and restoration (as necessary); and
- Limiting use of the shoreline for staging.

The engineering analysis considered Flushing Bay's physical characteristics, shoreline land uses and the parkland and marine recreational uses surrounding the bay in the proposed project methodology and phasing.

The limits of the proposed dredge area were determined based on a relationship between the existing bathymetry at and in the immediate vicinity of the proposed project area, the locations of the sediment mounds, and the proximity of the sediment mounds to CSO outfalls BB-006 and BB-008 (see **Figure B-3**). The areal extent and preliminary design of the proposed environmental dredging were developed in consultation with NYSDEC based on current bathymetry survey data (September 2011).

ELEMENTS OF PROPOSED PROJECT

The proposed project would involve dredging to a depth of four feet below MLLW. Based on the current dredge design, an estimated 85,000 cy of material would be removed. Various measures for water quality protection and odor control during construction would be implemented under the proposed project. To reduce dredging-related odors to the greatest extent

practicable, a community air monitoring program (CAMP) would be implemented. A temporary dock and pile relocation would also be required and existing stormwater outfalls would be modified. A wetland restoration plan would also be implemented to avoid impacts to tidal wetlands.

HYDRAULIC DREDGING

Hydraulic dredging, if used, would utilize a 10- to 12-inch hydraulic cutterhead dredge (see **Figure B-6**). Dredges are configured with a ladder mounted on the front of the dredge vessel. While in operation, the ladder is moved back and forth laterally across the dredge area while pumping the sediment from the bay bottom directly to a transport barge or to a dewatering barge that would process the dredged material, returning the process water to the dredging area and the processed material to a transport barge.

MECHANICAL DREDGING

Mechanical dredging, if used, would utilize a long-reach, barge-mounted excavator that is equipped with a hydraulically-actuated bucket, which is opened and closed via hydraulic components and transfers power from the motor to the bucket. Where feasible, dredging would be performed with an approximately 4-cy bucket with a watertight seal (see **Figure B-7**). Due to water depth limitations in the bay, small fully-loaded scows (100 cy) or larger lightly-loaded scows (1,000 cy) would be utilized under this dredging method. The dredged material would then be transferred to larger transport staging barges (2,000 to 3,000 cy). Each scow would be offloaded into a larger transport barge using a conventional barge-mounted excavator or crane with a clamshell bucket. Larger barges would transport dredge materials from the site. A description of the construction staging barges is included below.

TEMPORARY DOCK RELOCATION AND PILE REMOVAL

Certain DPR marina facilities may need to be temporarily relocated during active construction (dredging). To provide access for the dredging equipment, the proposed project would require the temporary removal and replacement of approximately 1,630 linear feet of floating docks and the temporary displacement of 70 boat slips at Pier 3 during construction. The proposed project includes provisions to provide boat owners with access to Pier 3 and its facilities to the greatest extent practicable. Upon completion of the proposed project, the relocated boat slips and docks would be restored to their original location (see **Figure B-8**). The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. DPR staff would alert boaters to the proposed project several months prior to construction mobilization and provide a construction schedule and guidance on alternate locations for docking and boating (i.e., away from the active dredging area). This would allow boaters to plan accordingly. Boaters would not be denied access to their boats at any time during construction, because the proposed project includes provisions to provide access to Pier 3 and its facilities.

In addition, a number of existing timber anchor piles at both Piers 2 and 3 would need to be removed, as they pose potential constraints to proposed project vessel navigation and other operations necessary to complete the proposed project.

The following options are proposed for pile removal:

- Pier 2: Existing timber piles would be removed and disposed, except for those designated by DPR to remain in place near the head of Pier 2. No new piles would be

installed at this location. Removed piles would be pulled in their entirety, rather than cut below the water surface.

- Pier 3: To provide access for a hydraulic or mechanical dredge at Pier 3, certain piles would be removed during construction and replaced with new piles at the same location. The floating docks would be reinstalled at the same location.

The contractor would be required to submit a detailed construction phasing plan that addresses pile removals at Pier 2 and temporary dock and pile replacements with provisions for continued boater access to the Pier 3 Marina (see **Figure B-8**). The contractor would also be required to either provide boat owners with direct access to their docks at Pier 3, or to provide a temporary launch service while access is temporarily decommissioned. The launch service would operate from either Pier 1 or a temporary dock installation at Pier 2. If necessary, DPR would also relocate some boats to empty slips at Pier 1 during active dredging at Pier 3. The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. Boaters would not be denied access to their boats at any time during construction, because the proposed project includes provisions to provide access to Pier 3 and its facilities.

WATERFRONT PROMENADE

The proposed project would enhance and support the use of a maritime recreational facility and recreational use of the bay. The proposed project would also support recreational use of the waterfront promenade. The proposed project would minimize any effects to the waterfront promenade. As stated above, dredging work would be performed primarily from the water. Proposed project work that may require limited landside access could include: (1) installation and removal of temporary construction-limit fencing or markers; (2) wetland restoration; (3) extensions of existing stormwater outfalls; and (4) relocation or installation of temporary utilities at Pier 3.

TIDAL WETLAND RESTORATION AND SHORELINE EMBANKMENT

The proposed project area encompasses three types of NYSDEC wetlands: intertidal marsh, shoals and mudflats, and littoral zone. Tidal mudflats are generally in the zone between the mean high and mean low water lines. The littoral zone is the benthic (permanently submerged) habitat below the mean low water (MLW) line to a water depth of six feet. Intertidal marsh with saltmarsh cordgrass (*Spartina alterniflora*) is present along much of the shoreline adjacent to the proposed project area. The proposed project would directly affect state and federally designated tidal wetlands. Restoration for disturbance to these wetlands is required in accordance with the USACE and NYSDEC wetland regulatory programs. Disturbance of about 3.02 acres of tidal mudflats along the near-shore under the proposed project would be restored at a 1:1 ratio, because restoration would occur on-site. Because disturbance to littoral zones would be temporary, no restoration would be necessary.

Wetland restoration and enhancement, in conjunction with the proposed removal of existing sediment mounds, would improve the wetland ecology of the bay. The proposed project would restore the shoreline embankment to a profile that provides a foundation for sustaining a viable salt marsh community. To further accomplish this objective, clean fill material would be placed along the shoreline from MHW to MLW to establish suitable substrate and a relatively flat

planting surface. Since MHW may be higher in the future due to sea level rise, the profile would start at an elevation of two feet above the current MHW.

MODIFICATION OF STORMWATER OUTFALLS

The proposed construction activities along the existing shoreline embankment would affect 10 existing stormwater outfalls to the bay. Five of these outfalls convey stormwater from Grand Central Parkway, and the others convey runoff from the adjacent parkland. At each outfall location within the proposed project area, the stormwater outfall pipes would be extended out to the proposed shoreline to allow for continued drainage. The average length of the proposed extension would be approximately 80 feet for each outfall.

PROJECT SCHEDULE

The anticipated duration of construction—including mobilization, dredging, wetland restoration and demobilization—would be a maximum of 24 months. The anticipated duration of the dredging portion of construction (active construction) would be a maximum of 15 months. NYSDEC and United States Army Corp of Engineers (USACE) permit applications would be submitted in December 2012. The notice to proceed for the proposed project would be issued two years from the effective date of these permits, and the proposed project would be completed within five years from the date of these permits per the CSO Consent Order, which requires specific dredging-related milestones. For the purposes of this EAS, the build year is considered to be 2018.

CONSTRUCTION STAGING

The proposed project would require temporary in-water staging barges that would be operational through the entire construction period. The proposed construction staging locations would be in deeper water to allow for navigable access and access to marine vessels in the vicinity of the proposed project area. The staging barges would be approximately 250 long and 50 feet wide. Based on the required area, water depth, and project goal to avoid interference with marine navigation for a vessel of this size, the following locations for the placement of the construction barges have been identified (see **Figure B-4**):

- Anchorage Area (East of Pier 3)—this location is within the federal anchorage immediately northeast of Pier 3; and
- North of Pier 1—this location is at the edge of the federal navigation channel west of Pier 1.

These locations reflect the easternmost and westernmost sites in the bay that are nearest to the shoreline and the waterfront promenade, where there is adequate water depth for a barge. These two locations would also be outside the designated navigation channel and therefore would not interfere with boat traffic in the bay. Finally, these two locations would be reasonably proximate to the sensitive receptors nearest the proposed project area, which includes Pier 3 marina and the World's Fair Marina Restaurant and Banquet Hall, Pier 1 public pier, and the waterfront promenade. The final staging location may vary between these two locations, with limitations to be imposed by the contract, including provisions indicating that these locations be outside the vicinity of the marina piers, shall not unreasonably interfere with marine navigation and not impact airport operations at LaGuardia Airport.

Dewatered (filtrate) from hydraulic dredging would be returned to the bay. Dredge material from mechanical dredging would settle for a minimum of 24 hours before the decant water is returned

to the bay. All discharge locations would be located within the proposed project area and within the area contained by turbidity curtains. For mechanically-removed material, smaller scows would be offloaded to larger staging barges.

With hydraulic dredging, construction activities that could operate from the staging barge include: dredged material sorting, screening, deodorizing, and dewatering. The hydraulic system would be capable of pumping dredge slurry and return water over an approximately 6,000-foot distance. Dewatering equipment would also include dewatering screens and hydrocyclones, flocculating equipment, flocculating agents, thickeners, and plate presses, with the output being dewatered dredged material and separated return water. The return water from the dewatering process would be pumped back to the proposed project area, while the dewatered dredge material would be placed in a separate barge for off-site transport to a disposal location. Disposal would be performed in accordance with federal, state and local approvals and regulations.

In both dredging methods, a 175-horsepower (hp) tending tug and other towing tugs and equipment barges would temporarily moor on the staging barges. Other activities on the staging barges under both dredging methods could include temporary storage of debris encountered during the dredging operation prior to off-site disposal and operation of mechanical equipment and power sources (e.g., pumps and generators).

CONSTRUCTION PHASING AND SEQUENCE

Seasonal interruptions for dredging and filling are not anticipated because of the relatively short construction duration. The proposed wetland restoration would be sequenced with the shoreline reconstruction to accommodate seasonal timeframes suitable for planting and plant survival.

Construction Sequence

Construction sequence is an essential component of the proposed project and must account for the maintenance of active marina operations at Piers 1 and 3 and the relatively shallow water depth in the proposed project area. The proposed project would likely commence at the eastern end of the proposed project area (near Pier 1) and progress westward, thereby creating the water depth necessary for construction vessel access as dredging progresses across the proposed project area. After the shoreline and tidal mudflat areas are dredged, dredging would continue in the littoral zone. Dredging activity would first be completed within Pier 2 without interruption and would then advance to Pier 3.

Under a hydraulic dredging approach, mechanical dredging would likely follow the start of hydraulic dredging by approximately two weeks. Fill and shoreline reconstruction operations would follow the start of mechanical dredging by roughly one week, allowing time for dredge areas to be filled and for stabilization of the new fill material. Under a purely mechanical dredging scenario, all dredging would similarly advance.

Odor controls, pile removal and replacement, and debris removal would be done simultaneously under both hydraulic and mechanical dredging scenarios. The proposed wetland restoration would follow the completion of the shoreline fill, installation of outfall extensions, and slope reconstruction.

The contractor would be required to submit a detailed construction phasing plan that addresses pile removals at Pier 2 and temporary dock and pile replacements at Pier 3 with provisions for continued boater access at the Pier 3 Marina (see **Figure B-8**).

For the purpose of this assessment, construction phasing sequence would be as follows:

- Phase 1
  - Remove piles from Pier 2 area.
  - Dredge Pier 2 area
  - Move boats from inner area of Pier 3 area to Pier 1 or to temporary anchorage/docks
  - Move docks from inner portion of Pier 3 to temporary storage
  - Remove piles as necessary from inner area of Pier 3
- Phase 2
  - Dredge inner portion of Pier 3 area
  - Dredge shoreline area of Pier 3 area
  - Fill and re-grade shoreline area
- Phase 3
  - Install replacement piles in inner Pier 3 area
  - Relocate docks from temporary storage back to original location at inner portion of Pier3
  - Move boats from outer portion of Pier 3 to inner docks recently returned to Pier 3 or to Pier 1, if insufficient space is available
  - Temporarily move individual piles, floating docks, dredge and replace
- Phase 4
  - Return boats to outer portion of Pier 3
  - Restore shoreline

Evening and Nighttime Construction

Night work would be used to limit conflicts with marina operations. Interference with use of the marina travel lift or berthing of private boats during the active boating season (e.g., April to October) would be limited to the greatest extent possible to nighttime hours or winter months when the travel lift is generally inactive. In addition, sufficient clearance for private boats would be provided in the proposed project area as the dredging progresses within and around Pier 3. Therefore, there would be instances when dredging activities would occur over a 24-hour/seven day a week time period. The final work schedules would be developed by the contractor, to be reviewed and approved by DEP prior to the start of construction.

DISPOSAL OF DREDGED MATERIAL

The dewatering/decanting process would reduce the quantity of material required for transport and disposal. Dewatered/decanted or stabilized sediment would be removed from the proposed project area and would be regulated as a solid waste, thereby requiring upland disposal at a licensed facility. The dredged material would be transported via a staging barge, to a licensed facility where the material would be processed and properly disposed of and/or shipped to a licensed disposal location. Disposal would be performed in accordance with federal, state and local approvals and regulations.

ENVIRONMENTAL PROTECTION MEASURES DURING CONSTRUCTION

Various measures for water quality protection and odor control during construction would be implemented under the proposed project. These are expected to include, but not be limited to, the use of a turbidity curtain to isolate and enclose the work area, visual turbidity monitoring to identify any localized changes in ambient conditions within the work area, and a Community Air

Monitoring Program (CAMP) to help suppress nuisance odors during construction. In addition, best management practices identified as conditions of the permits and required approvals would be implemented. The City's Noise Control Code would require the contractor to develop a Construction Noise Mitigation Plan prior to the start of work. This plan would include noise minimization strategies, methods, procedures and technologies for each piece of equipment or activity performed at the site during construction. A Construction Health and Safety Plan (CHASP) would also be developed by the contractor. The CHASP would be subject to review and approval by DEP prior to the start of construction.

REQUIRED PERMITS AND APPROVALS

Table A-1 lists permits and approvals from various local, state and federal agencies that may be required to implement the proposed project.

Table A-1

Regulatory Permits and Approvals Potentially Required for the Proposed Project

Agency	Permit/Approval	Regulated Activity
Federal		
U.S. Army Corps of Engineers (USACE)	Section 404 of the Clean Water Act (Individual Permit)	Discharge of dredged or fill materials into waters of the United States (including tidal wetlands)
USACE	Section 10 of the Rivers and Harbors Act of 1899 – (Individual Permit)	Work within navigable waters of the United States
US Coast Guard	Approval	Equipment staging in federal navigation channels or anchorage areas
Federal Aviation Administration	Aeronautical Survey Determination (ASD)	Potential adverse physical interference effect upon navigable airspace or air navigation facilities for work in the flight path of LaGuardia Airport.
State		
New York State Department of Environmental Conservation (NYSDEC)	Section 401 of the Clean Water Act (Water Quality Certification)	Proposed project includes placement of fill or activities that result in a discharge to a jurisdictional water body. Certification is used to ensure that federal agencies issuing permits or carrying out direct actions which may result in a discharge to the waters of the United States do not violate New York State's water quality standards or impair designated use
NYSDEC	Protection of Waters – Excavation and Fill (6 NYCRR PART 608)	Proposed project includes activities within a navigable waterway and the excavation and placement of fill material.
NYSDEC	Tidal Wetlands (6 NYCRR Part 661)	Proposed project is located in areas mapped by NYSDEC as New York State designated littoral zone and/or their adjacent areas (150 feet in NYC), as well as the placement of fill, dredging, excavation in tidal wetlands
New York State Department of State (NYSDOS)	Federal Consistency (Federal Coastal Consistency Assessment Form)	Proposed project is located in an area mapped by NYSDOS as a designated coastal area
New York State Department of Transportation	Approval	Modifications to outfalls from state highway
Local		
New York City Department of City Planning (DCP)	New York City Waterfront Revitalization Program - Consistency Assessment	Proposed project is located within the New York City mapped coastal zone boundary.
NYC Department of Parks & Recreation	Work Permit	Proposed project would involve work activities within Flushing Meadow - Corona Park and would affect park facilities
NYC Department of Small Business Services	Work Permit/Notice	Proposed project involves waterfront construction activities
New York City Department of Transportation	Approval	Modifications to outfalls from state highway

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A. INTRODUCTION

A screening analysis was completed for all technical areas of the City's 2012 *City Environmental Quality Review* (*CEQR) Technical Manual* to determine which technical areas would require a detailed analysis for the proposed project. Given the characteristics of the proposed project, a screening level of analysis is appropriate and a detailed analysis would not be required for the following *CEQR Technical Manual* technical areas:

- Community Facilities and Services;
- Shadows;
- Historic and Cultural Resources;
- Urban Design and Visual Resources;
- Water and Sewer Infrastructure;
- Solid Waste and Sanitation Services;
- Energy;
- Transportation;
- Air Quality;
- Greenhouse Gases;
- Noise;
- Public Health;
- Neighborhood Character; and
- Growth Inducing Aspects

B. SCREENED TECHNICAL AREAS

COMMUNITY FACILITIES AND SERVICES

The *CEQR Technical Manual* states that a detailed Community Facilities and Services analysis is needed if the potential exists for a project to have a direct or indirect effect on any community facility. The proposed project would be temporary and would not result in new development. In addition, there are no schools, libraries, fire stations, police stations, houses of worship, or health care facilities located within 400 feet of the proposed project area. The proposed project area is located within a highly urbanized area that is dominated by residential, commercial, and open space uses, as discussed in Section B, "Land Use, Zoning, and Public Policy."

The proposed project would not displace any public or publicly-funded community facilities, nor would it result in any direct or indirect impacts on such facilities, or result in the need for new or expanded facilities or services. Therefore, the proposed project would not result in potential significant adverse impacts to community facilities and services and no further assessment is necessary.

SHADOWS

The *CEQR Technical Manual* states that a Shadows assessment is required for any project subject to CEQR "only if the project would either result in new structures of 50 feet or more or be located adjacent to, or across the street from, a sunlight-sensitive resource." The proposed project would not result in the development of any permanent above-ground structures that would cast shadows. Therefore, the proposed project would not result in potential significant adverse impacts resulting from shadows and no further assessment is necessary.

HISTORIC AND CULTURAL RESOURCES

The *CEQR Technical Manual* states that a Historical and Cultural Resources assessment of potential historic and cultural resources impacts is required for any project subject to CEQR to help protect New York City's cultural heritage from potential impacts. Historic and cultural resources include both architectural and archeological resources. According to the New York State Historic Preservation Office (SHPO) and the New York City Landmarks Preservation Commission (LPC), the proposed project area is not architecturally, archeologically, or culturally significant, and the proposed project is not expected to result in potential significant adverse impacts to historic and cultural resources within the proposed project area, or in the surrounding area. Therefore, the proposed project would not result in potential significant adverse impacts to historic and cultural resources and no further assessment is necessary.

URBAN DESIGN AND VISUAL RESOURCES

The *CEQR Technical Manual* states that an Urban Design and Visual Resources assessment is required for any project subject to CEQR to assess the effect a proposed project may have on the arrangement, appearance, and functionality of the built environment. As discussed in Section B, "Land Use, Zoning, and Public Policy," the proposed project would be consistent with adjacent land uses, zoning classifications and existing public policies and no above-ground structures that would alter appearance of the built environment are proposed. Rather, the proposed project would be beneficial to residents and workers by removing accumulated sediment mounds and the associated nuisance odors, improving the aesthetic of the bay by removing deteriorated timber piles at Pier 2 and exposed sediment mounds and restoring wetlands along the shoreline. Therefore, the proposed project would not result in potential significant adverse impacts to urban design and visual resources and no further assessment is necessary.

WATER AND SEWER INFRASTRUCTURE

The *CEQR Technical Manual* states that a Water and Sewer Infrastructure analysis is required for projects subject to CEQR that would potentially result in significant adverse impacts on the City's water supply, wastewater or stormwater conveyance and treatment infrastructure. The proposed project would involve water-based dredging within Flushing Bay. No upland development is proposed or required and the proposed project would not impact the City's water supply, wastewater or stormwater conveyance and treatment infrastructure. Further, the proposed project is required by DEP's CSO Consent Order with NYSEDC. Therefore, the proposed project would not result in potential significant adverse impacts to water and sewer infrastructure and no further assessment is necessary.

SOLID WASTE AND SANITATION SERVICES

The *CEQR Technical Manual* defines a significant impact to Solid Waste and Sanitation Services as one that would result from a project that generates 50 tons of solid waste or more per

week. The proposed project would not result in a significant increase in resident or worker populations in the area and would therefore not result in an increase in solid waste that would impact existing services.

The dewatering/decanting process would reduce the quantity of material required for transport and disposal. Dewatered/decanted or stabilized sediment would be removed from the proposed project area and would be regulated as a solid waste, thereby requiring upland disposal at a licensed facility. The dredged material would be transported via a staging barge, to a licensed facility where the material would be processed and properly disposed of and/or shipped to a licensed disposal location. Disposal would be performed in accordance with federal, state and local approvals and regulations (refer to Section G, "Construction," for additional information). Therefore, the proposed project would not result in potential significant adverse impacts to solid waste and sanitation services and no further assessment is necessary.

ENERGY

The *CEQR Technical Manual* states that an Energy assessment is required for all projects subject to CEQR and considers the "project's consumption of energy and, where relevant, potential effects on the transmission of energy that may result from the project." No increase in the demand for energy or its transmission would result from the proposed project. Therefore, the proposed project would not result in potential significant adverse impacts to energy and no further assessment is necessary. Potential impacts associated with energy uses during construction activities are discussed in Section G, "Construction."

TRANSPORTATION

The *CEQR Technical Manual* states that a Transportation assessment is required for all projects subject to CEQR and considers "traffic operations and mobility, public transportation facilities and services, pedestrian elements and flow, safety of all roadway users (pedestrians, bicyclists, and vehicles), on- and off-street parking, or goods movement." The proposed project would not result in the generation of new pedestrian or vehicular trips, nor would it require the use of public transportation facilities and services. Construction activities would largely be water-based with limited upland activities anticipated. Therefore, the proposed project would not result in potential significant adverse impacts to transportation and no further assessment is necessary. For potential impacts associated with transportation during construction, refer to Section G, "Construction."

AIR QUALITY

The *CEQR Technical Manual* states that "ambient air quality, or the quality of the surrounding air, may be affected by air pollutants produced by motor vehicles, referred to as 'mobile sources;' or by fixed facilities, usually referenced as 'stationary sources' or by a combination of both." Historically, Flushing Bay received untreated industrial wastes, raw sewage and surface water runoff, which has contributed to the continuous deposition of organic and inorganic sediments within the bay. These sediments produce hydrogen sulfide (H_2S), a discernible gas that resembles "rotten egg," and other nuisance odors when exposed during low tide. Dredging would reduce nuisance odors associated with existing sediment mounds, thus improving air quality. Therefore, the proposed project would not result in potential significant adverse impacts to air quality and no further assessment is necessary. Potential temporary short-term impacts to air quality associated with construction activities are discussed in Section G, "Construction."

GREENHOUSE GAS EMISSIONS

The *CEQR Technical Manual* identifies three main sources of Greenhouse Gas (GHG) emissions: operations, mobile sources and construction activities. No significant direct or indirect GHG emissions from operations, mobile sources, or construction activities would be produced as a result of the proposed project. The proposed project would also not require any significant energy, nor have significant impacts to air quality. Therefore, the proposed project would not result in potential significant adverse impacts from GHG emissions and no further assessment is necessary.

NOISE

The *CEQR Technical Manual* states that a detailed Noise study is required for projects containing stationary noise sources subject to CEQR if the proposed project would cause the sources to operate within the line of site and 1,500 feet of a receptor. The proposed project would not result in new noise following completion of construction activities. Therefore, the proposed project would not result in potential significant adverse impacts from noise and no further assessment is necessary. Potential temporary and short-term impacts from noise associated with construction activities are discussed in Section G, "Construction."

PUBLIC HEALTH

The *CEQR Technical Manual* states that a Public Health assessment is required for projects subject to CEQR if "an unmitigated significant adverse impact is identified in other *CEQR* analysis areas, such as air quality, water quality, hazardous materials, or noise." As previously discussed, the proposed project would not result in impacts in these technical areas. Therefore, the proposed project would not result in potential significant adverse impacts to public health and no further assessment is necessary. A Construction Health and Safety Plan (CHASP) would be implemented during construction to limit potential health impacts associated with these materials and odorous compounds to workers during construction. These potential impacts are discussed in Section G, "Construction."

NEIGHBORHOOD CHARACTER

The *CEQR Technical Manual* defines a Neighborhood Character assessment as an evaluation of various elements that define a local community. These elements may include land use, urban design, visual resources, historic resources, socioeconomics, traffic and/or noise. The proposed project location is within a residential section of Queens that is currently zoned as a R3-2 district. Historically, Flushing Bay received untreated industrial wastes, raw sewage and surface water runoff, which has contributed to the continuous deposition of organic and inorganic sediments within the bay. The proposed project would be beneficial to the surrounding community by reducing nuisance odors associated with existing sediment mounds, improving the aesthetic of Flushing Bay by removing the deteriorated timber piles at Pier 2 and exposed sediment mounds, restoring wetlands along the shoreline, and enhancing the shoreline habitat. Therefore, the proposed project would not result in potential significant adverse impacts to neighborhood character and no further assessment is necessary.

GROWTH INDUCING ASPECTS

The *CEQR Technical Manual* defines a Growth Inducing Aspects assessment as an evaluation of the "secondary" impacts of a proposed project that trigger further development. Projects that add substantial new land use, new residents, or new employment could induce additional

development of a similar kind, or support new uses (e.g., stores to serve new residential uses). Projects that introduce or greatly expand infrastructure capacity (e.g., sewers, central water supply) might also induce growth. The proposed project would result in environmental dredging of Flushing Bay and would not trigger further development or induce growth. Therefore, the proposed project would not result in potential significant adverse impacts to growth inducing aspects and no further assessment is necessary. ✷

Section B: Land Use, Zoning, and Public Policy

A. INTRODUCTION

The 2012 *CEQR Technical Manual* states that a preliminary Land Use, Zoning, and Public Policy analysis should be conducted if a project would result in a change in land use or zoning that is different from surrounding land uses and/or zoning; if there is the potential for a project to affect an applicable public policy; if the project is a large, publicly sponsored project; and/or if any part of the directly affected project area is within the New York City Waterfront Revitalization Program (WRP) boundaries. This assessment has been prepared following the guidance and methodologies of the 2012 *CEQR Technical Manual* and provides a comprehensive inventory of existing land use, zoning, and public policy conditions in the vicinity of the proposed project within a ½-mile study area (see **Figure B-9**). In addition, the WRP consistency assessment can be found after this chapter in Section B-1.

B. METHODOLOGY

The proposed project area, the adjacent water area, the waterfront upland along the bay, and the residential neighborhoods inland and nearest to the proposed project area comprise the study area. Because the proposed project area is within the waters of Flushing Bay, this analysis also includes in-water uses. A comprehensive inventory of baseline data was performed for this analysis with a focus on uses that are typically more sensitive to changes in environmental conditions such as ambient air or noise conditions. These land uses include open space, residential, medical, and community facility uses. Sources of information used in developing the land and water use database included DEP, the New York City Department of Parks and Recreation (DPR), the New York City Department of City Planning (DCP), the New York City Department of Buildings (DOB), and the New York City Economic Development Corporation (EDC). Data were then mapped and field verified. The New York City Zoning Resolution was used to develop the zoning maps and descriptions of the zoning districts. Relevant public policies were determined based on information from DEP, DCP, DPR, and EDC.

For the purposes of this EAS, the build year is considered to be 2018. Any known development projects, anticipated changes in zoning, or other changes due to public policies are described to establish the future without the proposed project. The sources used to develop the future condition are those cited above for identifying future projects that could affect land use, zoning and public policy conditions through the 2018 analysis year.

Finally, this analysis assesses the potential for any adverse impacts to land and water uses, zoning, and public policy that may result from the proposed project. The impact analysis is based on the project designs as presented in the "Preliminary Design Report for Flushing Bay, Queens New York" (AECOM/HydroQual, November 2012) and additional analyses completed for this EAS. Per the *CEQR Technical Manual*, potential impacts were analyzed as either direct or indirect impacts. Potential direct impacts are those that could directly modify land uses in the proposed project area, such as relocation or displacement of uses. Potential indirect impacts are the potential effects of the proposed project on land or water uses outside the proposed project area.

C. EXISTING CONDITIONS

LAND AND WATER USES

PROPOSED PROJECT AREA

The proposed project area is approximately 16.8 acres of water in Flushing Bay and includes marine facilities operated by DPR, including docks and piers over a portion of the World's Fair Marina (see **Figure B-9**). The proposed project area is bounded to the west and south by the Flushing Bay shoreline and the waterfront promenade, which is immediately upland. LaGuardia Airport is to the northwest. Pier 1, a public pier within Flushing Meadows-Corona Park, borders the proposed project area to the southeast. The waters of Flushing Bay are generally shallow, but a federal navigation channel is east of the proposed project area and provides a navigable connection with the East River. In addition, a federally-designated anchorage area is located northeast of Pier 3. As shown in **Figure B-4**, the designated channel ends at Pier 1.

The World's Fair Marina was first built for the 1939 World's Fair and later expanded and modernized as part of the 1964/65 World's Fair. The marina is now a DPR-operated complex of three piers that are referred to as Piers 1, 2 and 3 (from east to west). Piers 2 and 3 are partially within the proposed project area. Pier 1 is outside, but adjacent and southeast to the proposed project area. The World's Fair Marina has approximately 300 seasonal boat slips, 20 transient slips and 10 commercial slips. Of these, about 200 seasonal slips are provided at Pier 3. Pier 3 is not accessible to the general public and is only open to boat owners and their guests. Landside of Pier 3 is the marina's main administration building, which houses DPR's Marine Division office as well as the World's Fair Marina Restaurant and Banquet Hall. Pier 2 is deteriorated and unoccupied.

ADJACENT AREA

Pier 1 is immediately southeast of the proposed project area and serves as the main public pier in the World's Fair Marina complex. Pier 1 is accessible to the general public for recreational and commercial dockage. Pier 1 has approximately 100 boat slips, a water taxi landing, approximately 20 transient and 10 commercial slips (with commercial charter dockage), a gas dock/pump-out station, picnic tables, a designated fishing area, the World's Fair Café, and kayak docks. Larger excursion and charter boats dock along the north side of Pier 1, while the interior dockage area is used by private recreational sail and power craft. Recreational kayak and crewing teams (e.g., dragon boat teams) also use dockage at Pier 1.

Upland and immediately adjacent to the shoreline is parkland of Flushing Meadows-Corona Park. Parallel with the shoreline is the waterfront promenade, which extends along the entire south and west shorelines of Flushing Bay. Approximately 2,250 linear feet of the waterfront promenade front the proposed project area. The waterfront promenade is approximately 1.4 miles long and extends from LaGuardia Airport on the west to Willets Point on the east. The waterfront promenade was reconstructed in 2001 with an asphalt biking and walking path, benches, and lighting. Shea Stadium Road provides access to the waterfront promenade from the larger Flushing Meadows-Corona Park. The Grand Central Parkway and Northern Boulevard separate the waterfront promenade and waterfront from the residential communities that are further inland and to the south and west. There are, however, two pedestrian overpasses crossing the Grand Central Parkway that provide access to the park. In addition to the waterfront promenade, there are two other public waterfront access points fronting the bay. First, there are several surface parking facilities along the waterfront west of Piers 2 and 3 and south of Pier 1.

These parking areas provide parking for about 600 vehicles. Second, the World's Fair Marina Restaurant and Banquet Hall facility is within the marina office building fronting Pier 3. This facility, called the World's Fair Marina Restaurant and Banquet Hall, operates as both a park concession area and a 500-person catering facility, for hosting weddings and other large events. The banquet facility includes a hall and an outdoor terrace (see Section C, "Socioeconomic Conditions," for additional details on banquet operations).

STUDY AREA

Introduction

The ½-mile study area extends north to LaGuardia Airport, south to Roosevelt Avenue, east to 126th Street (at the east end of Citi Field), and west to 100th Street in East Elmhurst (see **Figure B-9**). The study area includes portions of LaGuardia Airport, Flushing Meadows-Corona Park, and the neighborhoods of East Elmhurst and North Corona.

LaGuardia Airport and Major Roadways

Transportation infrastructure is a defining land use in the study area. The northern portion of the study area is occupied by the eastern portion of LaGuardia Airport. The airport is one of two major airports in the City and covers over 600 acres. The eastern portion of the airport, including access roads, terminals, and runways are within the study area. In addition, there are major regional parkways and City streets within the study area. These include the Grand Central Parkway, which parallels the Flushing Bay shoreline before turning south along the west side of Flushing Meadows-Corona Park, and Northern and Astoria Boulevards, which run east to west across the study area.

Flushing Meadows-Corona Park

The largest open space resource in the study area is Flushing Meadows-Corona Park, a major recreational and cultural destination for City residents and visitors from throughout the New York metropolitan area. This City park is approximately 1,255 acres in size and is under the jurisdiction of DPR. In addition to the waterfront promenade and piers previously described, the portion of the park within the study area includes Citi Field, the 45,000-seat home field stadium for the New York Mets Major League Baseball team, and the associated surface parking.

East Elmhurst Neighborhood

The East Elmhurst neighborhood is generally north of Astoria Boulevard. This neighborhood is characterized by detached single family houses, although there are also semi-detached houses and small apartment buildings. There is no defined commercial street within the study area and only a few neighborhood commercial and auto-related uses exist along Astoria Boulevard. There is, however, a concentration of hotels in the northwest portion of the study area, along Ditmars Boulevard and across from LaGuardia Airport. An additional hotel is also under construction on Northern Boulevard and 112th Street (see "Future Without the Proposed Project").

North Corona Neighborhood

North Corona is south of Northern Boulevard and contains a greater mix of housing types, including attached houses and apartment buildings. There are two prominent higher-density residential developments in this neighborhood: the 301-unit Dorie Miller Cooperative houses and the 132-unit Meadow Manor housing development. Commercial and retail uses in North Corona are primarily concentrated along Northern Boulevard.

ZONING

INTRODUCTION

The study area mainly contains residential zoning districts with commercial overlays along major streets such as Northern Boulevard. The zoning districts of the study area are shown in **Figure B-10** and are listed in **Table B-1**.

PROPOSED PROJECT AREA

The proposed project area contains DPR facilities, but is west of the mapped limits of Flushing Meadows-Corona Park (see **Figure B-10)**. Therefore, the main zoning district within the proposed project area is R3-2, the nearest upland zoning district.

ADJACENT AREA

The adjacent area to the southeast is within the mapped limits of Flushing Meadows-Corona Park (see **Figure B-10**). Thus, there are no City zoning districts in this adjacent area. In the adjacent area to the north, the R3-2 zoning would apply.

STUDY AREA

Most of the northern portion of study area (East Elmhurst) is zoned as an R3-2 residential district. R3-2 districts typically have attached houses, semi-detached houses, and small three-story apartment buildings. R3-2 is the lowest density zoning district in the City that allows multiple dwellings (generally two to three stories). The maximum floor area ratio (FAR) is 0.5.

Table B-1
Zoning Districts in the Study Area

Zoning District	Maximum FAR[1]	Uses/Zone Type
Residential Districts		
R3-2	0.5 residential uses (0.6 with attic bonus)	Low-density residential with variety of housing types
R4	0.75 residential uses (0.9 with attic bonus)	Low-density residential with variety of housing types
R5	1.25 residential uses	Low- to medium-density residential
R5-A	1.1 residential uses	Contextual district allowing 1-to 2-family detached houses
R6-A	3.0 residential uses	Contextual medium-density residential district
R6-B	2.0 residential uses	Contextual rowhouse district
Commercial Districts		
C1-4	1.0-2.0 commercial uses	Local retail overlay district
CB-4	1.0-2.0 commercial uses	Local retail overlay district
C4-2	3.4 commercial uses; 2.43 residential uses	Regional commercial centers

Notes: [1]Floor area ratio (FAR) is a measure of density establishing the amount of development allowed in proportion to the lot area.
Sources: *New York City Zoning Resolution,* 2012.

The only non-residential zoning is in the northern portion of the study area. This includes an M1-1 zoning district at LaGuardia Airport. M1-1 zoning districts allow low-density non-residential uses. Across Grand Central Parkway from the airport is a C4-2 commercial district. These commercial districts are generally mapped to provide regional centers outside of the City's

major central business districts. The zoning districts are characterized by larger retail uses such as department stores, hotels, and offices. The maximum FAR in C4-2 districts is 3.4 for commercial uses, and 2.43 for residential uses. In the study area, the C4-2 zoning district is mapped along Ditmars Boulevard north of 23rd Avenue, which corresponds to the cluster of hotel uses described above.

The majority of the southern portion of the study area (North Corona) is zoned R3-2, R4, and R5. There are also two contextual zoning districts, R6-A and R6-B. R4 districts allow a greater variety of housing types at a higher density than is permitted in R3-2 districts.

While North Corona is zoned primarily for residential uses, there is C1-2 commercial zoning along Astoria Boulevard. C1-2 zoning is a commercial overlay designation that is mapped within residence districts. These commercial overlays are mapped along major streets that can provide local retail needs, and are characterized by uses such as grocery and convenience stores, restaurants, and small offices. A CB-4 overlay zoning district is also mapped along Northern Boulevard.

PUBLIC POLICY

FLUSHING BAY WATERBODY/WATERSHED FACILITY PLAN AND LONG TERM CONTROL PLAN

The 2005 CSO Consent Order between DEP and NYSDEC identified 18 drainage areas in the City where Waterbody/Watershed Facility Plans (WWFPs) would be prepared. The goals of these plans were to develop cost-effective means for reducing the CSO impacts on local water quality and the environment including a reduction in pollutant loads, odors, and floatables. A WWFP for Flushing Bay was prepared and submitted to NYSDEC in August 2011.

On March 8, 2012, NYSDEC and DEP signed an agreement to reduce CSOs using a hybrid green and gray infrastructure approach. As part of this 2012 Amended CSO Consent Order, DEP will develop 10 waterbody-specific Long Term Control Plans (LTCPs) plus one citywide LTCP to reduce CSOs and improve water quality in NYC's waterbodies and waterways. The goal of each LTCP is to identify appropriate CSO controls necessary to achieve waterbody-specific water quality standards, consistent with the Federal CSO Policy and the water quality goals of the Clean Water Act (CWA). NYSDEC approved the Flushing Bay WWFP on May 4, 2012 and the Flushing Bay LTCP will be submitted to NYSDEC by June 2017.

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM

The New York City Waterfront Revitalization Program (WRP), first adopted in 1982, encourages coordination among all levels of government to promote sound waterfront planning and requires consideration of the program's goals in making land use decisions. DCP administers the program, which is designed to balance economic development and preservation. The WRP has designated the southwestern shoreline of Flushing Bay and all of Flushing Creek as Special Natural Waterfront Areas (SNWA). The designated area runs from just south of La Guardia Airport, southeast along the bay, around Flushing Creek and up the eastern shore to about 125th Street.

The Waterfront Vision and Enhancement Strategy (WAVES) will reconnect New Yorkers and visitors to the water and reclaim New York City's standing as a premier waterfront city by transforming the City's waterfront with new parks, new industrial activities and new housing. It will capitalize on investments in water quality that have set the stage for ecological recovery,

including enhancements to our natural waterfront and wetlands. A completed WRP consistency assessment form is also included in Section B-1.

NEW YORK CITY COMPREHENSIVE WATERFRONT PLAN

In March 2011, DCP released "Vision 2020: New York City Comprehensive Waterfront Plan" (*Vision 2020*). This plan outlines a number of goals for the City's waterfront, and recognizes the range of waterfront uses and opportunities created by the City's approximately 520 miles of shoreline. In May 2012, the City issued its One-Year Progress Report on the Waterfront Action Agenda, reporting that within the first year of WAVES, the City completed 34 initiatives and another 71 initiatives are on schedule for completion (84 percent of total projects). Fourteen initiatives (11 percent) are progressing, but with delays. Five projects (4 percent) have been reconsidered for reasons such as the availability of funding and changes to development plans.

The plan breaks down the City shoreline into a number of waterfront reaches. Reach 11, called the Queens Upper East River, includes Flushing Bay. The recommendations and policies of *Vision 2020* that pertain to the bay include:

- Study the bay hydrology and identify ways to improve water circulation and reduce siltation;
- Explore options for expanding mooring fields for recreational boats;
- Improve maintenance of the waterfront promenade; and
- Improve pedestrian and bicycle connections to upland areas to the west and south of the waterfront promenade including Flushing Meadows-Corona Park.

In addition to these reach-specific plans, *Vision 2020* contains a number of goals common to all waterfront reaches that would also apply to Flushing Bay, including improving water quality and natural habitats, restoring and protecting wetlands and shorefront habitats, improving public access to the waterfront, and protecting the working waterfront.

FLUSHING MEADOWS-CORONA PARK STRATEGIC FRAMEWORK PLAN

In 2007, DPR released the "Flushing Meadows-Corona Park Strategic Framework Plan." The plan proposes a series of changes and improvements to the park that would increase its functionality and sustainability along with reclaiming the themes of the 1939 and 1964/65 World's Fairs around which the park was built. Although the plan has no specific goals for the Flushing Bay waterfront, it does have three broad goals: (1) restore landmark structures and Flushing Creek; (2) create more green space, reconfigure the lakes, and improve their utility as natural and recreational resources; and (3) reconnect the park to the neighborhood and City by creating better access and more logical activity corridors within the park. Additional objectives of the plan include reducing runoff, energy use, and impervious coverage; establishing the park as a center for cultural activities; and finding better uses for underutilized structures.

PLANYC

In 2007, the Mayor's Office of Long-Term Planning and Sustainability (OLTPS) released PlaNYC to address the challenges facing the City (e.g., preparing the city for one million additional residents, strengthening the economy, combating climate change, and enhancing the quality of life for all New Yorkers). Over 97 percent of the 127 initiatives in PlaNYC were launched within one year of its release, and almost two-thirds of its 2009 milestones were

achieved or substantially achieved. In 2011, PlaNYC was updated to build on the progress and lessons of the first four years. The plan's overall objectives include the following[1]:

- Housing and Neighborhoods—Create homes for almost a million more New Yorkers while making housing and neighborhoods more affordable and sustainable.
- Brownfields—Clean up all contaminated land in New York City.
- Parks and Public Space—Ensure all New Yorkers live within a ten-minute walk of a park.
- Waterways—Improve the quality of New York City's waterways to increase opportunities for recreation and restore coastal ecosystems.
- Water Supply—Ensure the high quality and reliability of our water supply system.
- Energy—Reduce energy consumption and make our energy systems cleaner and more reliable.
- Transportation—Expand sustainable transportation choices and ensure the reliability and quality of our transportation network.
- Air Quality—Achieve the cleanest air quality of any big U.S. city.
- Solid Waste—Divert 75% of our solid waste from landfills.
- Climate Change—Reduce greenhouse gas emissions by more than 30%. Increase the resilience of our communities, natural systems, and infrastructure to climate risks.

In addition to these overall goals, PlaNYC presents a number of specific objectives for New York City waterways. These include: improving the quality of waterways; providing additional recreational opportunities; supporting public access provided by the waterfront; removing pollution from contaminated waterways to benefit local ecosystems; protecting and restoring wetlands, aquatic systems, and ecological habitat; and providing economic opportunities for surrounding neighborhoods.

D. FUTURE WITHOUT THE PROPOSED PROJECT

LAND AND WATER USES

Under the No Action Condition, no changes to water uses are expected within the proposed project area. Conditions at Piers 2 and 3 in the World's Fair Marina are expected to remain unchanged with the exception of improvements in maritime infrastructure that DPR would undertake as part of its regular maintenance and repair operations. DPR has no plans at this time to reactivate Pier 2. The deteriorated Pier 2 is adjacent to outfall BB-006 and has not been used for several years due to long term sedimentation that eventually precluded ongoing use as an active marina.

There would also be no removal of accumulated CSO sediments, and continued accumulation of outfall deposits in the proposed project area is anticipated. Without the removal of sediment, the potential for Pier 2 to be utilized in the future and the ability of Pier 3 to operate longer into the future with deeper water available to boaters would be limited.

[1] http://www.nyc.gov/html/planyc2030/html/theplan/implementation.shtml, accessed on 11/12/12

ADJACENT AREA

Under the No Action Condition, there are no proposed changes to land or water uses adjacent to the proposed project area. Conditions at Pier 1 in the World's Fair Marina would remain unchanged with the exception of improvements in maritime infrastructure that DPR would undertake as part of its regular maintenance and repair operations. Conditions along the waterfront promenade and World's Fair Marina Restaurant and Banquet Hall facility would also remain unchanged.

STUDY AREA

A total of 14 background development projects are expected to be completed by 2018. The locations of these projects are shown in **Figure B-11** and are listed in **Table B-2**. These projects will add new residential, commercial and public facility development to the study area, including a hotel and a 420-seat public elementary school. Eight of the No Action projects are projected as a result of the North Corona Rezoning. In addition, the Willets Point 126th Street Storm Sewer Outfall project is expected to be completed in 2013. This capital project is replacing a 60-inch diameter storm sewer beneath 126th Street with a new 7.5-foot wide by 5-foot high box culvert. The proposed outfall improvement would provide additional capacity to handle stormwater runoff from future development at Willets Point, which is located just outside of the study area.

Table B-2
No Action Projects

Map No.	Location	Development Program	Projected Build Year
1	110-08 Northern Blvd	420-seat (50,000-gsf) elementary school	2013
2	3B-33 112th Street	2 residential units	2013
	3B-31 112th Street	2 residential units	2013
	3B-29 112th Street	2 residential units	2013
3	3B-56 101th Street	11,000-gsf commercial uses	2013
4	37-56 108th Street	4 residential units; 1,785-gsf commercial uses	2013
5	11B-01 Northern Blvd	Spring Hill Suites Corona – 156,000-gsf hotel	2012
6	108-04, 14, 16 Astoria Blvd[1]	84 residential units, 34,965 gsf community facility	2020
7	110-09 Northern Boulevard[1]	31 residential units, 15,500 gsf of commercial use	2020
8	111-10, 12, 16 Northern Blvd; 3B-20 112th Street; 3B-19 111th Street[1]	78 residential units, 32,621 gsf community facility, 51 parking spaces	2020
9	11B-12, 18, 24 Astoria Blvd[1]	38 residential units, 16,034 gsf community facility	2020
10	Block bounded by Astoria Blvd, Northern Blvd, and 112th Place[1]	147 residential units, 73,329 gsf of commercial use	2020
11	108-09 Northern Boulevard[1]	18 residential units, 8,970 gsf commercial	2020
12	106-15 Northern Boulevard[1]	11 residential units, 5,502 gsf commercial	2020
13	3B-56 106th Street[1]	14 residential units, 7,144 gsf commercial	2020
14	126th Street and Flushing Bay	Willets Point 126th Street Storm Sewer Outfall project	2012

Notes: [1]Projects anticipated as a result of the North Corona Rezoning (*CEQR* No. 03DCP058Q) and revised per the subsequent North Corona 2 Rezoning.
Sources: New York City Department of Buildings; New York School Construction Authority, New York City Economic Development Corporation.

ZONING

Under the No Action condition, it is anticipated that the Willets Point Urban Renewal Plan (URP) would be implemented and would result in zoning changes.

The first phase of the project would commence with the remediation and development of an approximately 23-acre portion of the Special Willets Point District and the development of "Willets West" on the existing parking lot west of Citi Field. The 23-acre portion of the District would be remediated to address any hazardous materials issues. Upon completion of the environmental remediation, a 200-room hotel and approximately 30,000 square feet of retail space would be constructed above the floodplain along the east side of 126th Street, activating the 126th Street corridor, and a 2,800-space, 20-acre surface parking area would be developed within the District east of the retail and hotel uses.

The Willets Point URP would result in the following zoning changes:

- Changing from an R3-2 District to a C4-4 District property bounded by Northern Boulevard, the westerly line of a westerly service entrance of Van Wyck Expressway Extension, the southeasterly street line of a service entrance, the southeasterly street line of Willets Point Boulevard, the northeasterly centerline prolongation of 34th Avenue, Willets Point Boulevard, and a southerly service exit of Northern Boulevard;
- Changing from an M3-1 District to a C4-4 District property bounded by Northern Boulevard, a southerly service exit of Northern Boulevard, Willets Point Boulevard, the northeasterly centerline prolongation of 34th Avenue, the southeasterly street line of Willets Point Boulevard, the southeasterly street line of a service entrance, the westerly boundary line of a park, a line 1280 feet northwesterly of Roosevelt Avenue, a line 540 feet northwesterly of a U.S. Pierhead and Bulkhead Line, Roosevelt Avenue, and 126th Street; and
- Establishing a Special Willets Point District ("WP") bounded by Northern Boulevard, a westerly service entrance of Van Wyck Expressway Extension, the westerly boundary line of a park, a line 1280 feet northwesterly of Roosevelt Avenue, a line 540 feet northwesterly of a U.S. Pierhead and Bulkhead Line, Roosevelt Avenue, and 126th Street. The Special District would waive some C4-4 district requirements in order to facilitate development of the District in accordance with the URP.

PUBLIC POLICY

Under the No Action condition, it is anticipated that the Flushing Bay LTCP would be completed by June 2017, as required by the 2012 Amended Order on Consent.

E. FUTURE WITH THE PROPOSED PROJECT

LAND AND WATER USES

PROPOSED PROJECT AREA

Under the proposed project, approximately 16.8 acres of Flushing Bay would be dredged. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay.

As part of the proposed project, certain marina facilities may need to be temporarily relocated. To provide access for the dredging equipment, the proposed project would require the temporary removal and replacement of approximately 1,630 linear feet of floating docks and the temporary displacement of 70 boat slips at Pier 3 during construction. The proposed project includes provisions to provide boat owners with access to Pier 3 and its facilities to the greatest extent

practicable. Upon completion of the proposed project, the relocated boat slips and docks would be restored to their original location (see **Figure B-8**). The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. Boaters would not be denied access to their boats at any time during construction, because the proposed project includes provisions to provide access to Pier 3 and its facilities. In addition, a number of existing timber anchor piles at both Piers 2 and 3 would need to be removed, as they pose potential constraints to project vessel navigation and other operations necessary to complete the proposed project.

Therefore, the proposed project would not result in long-term permanent operational impacts on water uses in the proposed project area. Rather, the proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay.

The proposed project would directly impact state and/or federally designated tidal wetlands. To address the proposed impacts to tidal wetlands, a wetland restoration and planting program is proposed as part of the proposed project. The proposed wetland restoration would be expected to enhance the environmental habitat along the shoreline (see Section E, "Natural Resources," for additional details on the wetland restoration and planting program).

Therefore, the proposed project would not result in potential significant adverse impacts on land and water uses in the proposed project area.

ADJACENT AREA

The proposed project may require the installation of a temporary boat launch at Pier 1 or Pier 2 adjacent to the proposed project area to service the boat slips on Pier 3 that would remain active during construction. The temporary boat launch would not be expected to significantly affect operations at Pier 1 or deteriorated Pier 2.

The proposed project would require temporary in-water staging barges that would be operational throughout the entire construction period. The proposed construction staging locations would be in deeper water to allow navigable access to marine vessels in the vicinity of the proposed project area. The staging barges would be approximately 250 feet long and 50 feet wide. Based on the required area, water depth and need to avoid interference with marine navigation for a vessel of this size, two locations for the placement of the construction barges have been identified (see **Figure B-4**):

- Anchorage Area (East of Pier 3)—this location is within the federal anchorage immediately northeast of Pier 3; and
- North of Pier 1—this location is at the edge of the federal navigation channel west of Pier 1.

These locations reflect the easternmost and westernmost sites in the bay that are nearest to the shoreline and the waterfront promenade where there is adequate water depth for the barge. These two locations would also be outside the designated navigation channel and therefore would not interfere with boat traffic in the bay. Finally, from the perspective of construction impact analysis, these two locations are reasonably proximate to the sensitive receptors nearest the proposed project area, which includes the Pier 3 marina and the banquet facility, the Pier 1 public pier, and the waterfront promenade. The final staging location may vary between these

two locations, with limitations to be imposed by the contract. This would include provisions indicating that these locations outside the vicinity of the marina piers, shall not unreasonably interfere with marine navigation, and not impact airport operations at LaGuardia Airport.

Upon completion of the proposed project, the relocated docks and boat slips would be restored and any temporary staging barges would be removed. No additional direct or indirect operational impacts would be expected. Therefore, the proposed project would not result in potential significant adverse impacts on land and water uses in the area adjacent to the proposed project.

STUDY AREA

The proposed project would not result in potential significant adverse impacts on land and water uses in the proposed study area.

ZONING

PROJECT AREA

The proposed project would not conflict with or impact City zoning, nor would it require any zoning approvals. Therefore, the proposed project would not result in potential significant adverse impacts on zoning in the proposed project area.

ADJACENT AREA

Because the adjacent area is not within a City zoning district, the proposed project would not conflict with or impact City zoning. Therefore, the proposed project would not result in potential significant adverse impacts on zoning in the area adjacent to the proposed project.

STUDY AREA

The proposed project would not require any zoning approvals and would neither directly nor indirectly impact any zoning districts in the study area. Therefore, the proposed project would not result in potential significant adverse impacts on zoning in the proposed study area.

PUBLIC POLICY

FLUSHING BAY WATERBODY/WATERSHED FACILITY PLAN AND LONG TERM CONTROL PLAN

As discussed above, the proposed project would be consistent with the objectives of the Flushing Bay WWFP and the dredging program recommended in the WWFP. The proposed project would also support the upcoming Flushing Bay LTCP (June 2017). Therefore, the proposed project would be expected to support the WWFP and upcoming LTCP and would not result in potential significant adverse impacts to this public policy.

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM

As described in greater detail in Section B-1, the proposed project would be consistent with the City's coastal zone management program, including Flushing Bay-specific policies and policies for the protection and restoration of coastal ecosystems (e.g., wetlands), protection of water quality, minimizing conflicts with maritime recreation, and avoiding construction period impacts on marine resources. Therefore, the proposed project would not result in potential significant adverse impacts to the City's Waterfront Revitalization Program.

NEW YORK CITY COMPREHENSIVE WATERFRONT PLAN

The proposed project would support the Vision 2020: New York City Comprehensive Waterfront Plan's objectives for Reach 11, which includes Flushing Bay, by removing accumulated sediment, improving conditions that support the use of the water for recreational boating, and restoring and protecting wetlands. Therefore, the proposed project would not result in potential significant adverse impacts to this public policy.

FLUSHING MEADOWS-CORONA PARK STRATEGIC FRAMEWORK PLAN

The proposed project would enhance and support the use of a maritime recreational facility and recreational use of the bay. The proposed project would also support recreational use of the water and the waterfront promenade. Thus, the proposed project would be consistent with and supportive of the Flushing Meadows-Corona Park Strategic Framework Plan. Therefore, the proposed project would not result in potential significant adverse impacts to this public policy.

CONSISTENCY WITH PLANYC

The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 would further improve the aesthetics of the bay. A wetland restoration plan would also be implemented to avoid impacts to tidal wetlands. The proposed restoration plan would enhance existing tidal wetland habitat along the shoreline and would offset potential disturbance to existing intertidal marsh and mudflats in the proposed project area. Wetland restoration and enhancement, in conjunction with the proposed removal of existing sediment mounds, would improve the wetland ecology of Flushing Bay. ✷

Section B-1: Waterfront Revitalization Program Consistency

A. INTRODUCTION

The New York City Waterfront Revitalization Program (WRP) was adopted by the City of New York in 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. The WRP establishes the City's Coastal Zone and includes 10 policies dealing with: (1) residential and commercial redevelopment; (2) water-dependent and industrial uses; (3) commercial and recreational boating; (4) coastal ecological systems; (5) water quality; (6) flooding and erosion; (7) solid waste and hazardous substances; (8) public access; (9) scenic resources; and (10) historical and cultural resources.

Under the WRP, federal, state and local discretionary actions within the coastal zone are reviewed to ensure their consistency with the WRP policies. This provides the city with the opportunity to comment on any development that occurs within its coastal zone. The proposed environmental dredging of Flushing Bay (proposed project) would be within the City's coastal zone boundary and is therefore subject to review for consistency with the WRP's policies. A WRP Consistency Assessment Form (CAF) is provided in **Attachment C**.

The proposed project (see Section A, "Project Description") was reviewed to determine its general consistency with each of these policies and subpolicies. This review identified several subpolicies that were not applicable, which consisted of subpolicies 1.1, 2.1, 2.3, 3.3, 5.2, 6.2, 6.3, 8.2, 8.3, 10.1 and 10.2. In instances where a component of the proposed project required clarification or was potentially inconsistent with a specific policy or subpolicy, further discussion is provided below.

B. CONSISTENCY ASSESSMENT

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

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

The proposed project involves environmental dredging of inshore areas in the southern portion of Flushing Bay and would not include commercial or residential development. Therefore, this subpolicy is not applicable.

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

The proposed project would involve dredging 16.8 acres to a depth of four feet below mean lower low water (MLLW), yielding approximately 85,000 cubic yards of sediment removal. Upon completion, the mudline in the proposed project area would be four feet below MLLW (-4 MLLW) at the shallowest depth, thus removing sediment currently exposed at low tide and

related nuisance odors. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. While the proposed project would not directly encourage new non-industrial development of the waterfront, it would improve the aesthetics within the existing World's Fair Marina and adjacent waterfront promenade. Therefore, the proposed project would be consistent with this subpolicy.

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

The proposed project would consist of dredging within Flushing Bay and would not result in new development that would require the use of existing public facilities or infrastructure. Therefore, the proposed project would be consistent with this subpolicy.

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

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

The proposed project is not located within a SMIA; therefore, this subpolicy does not apply.

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

The proposed project would involve environmental dredging outside of a SMIA. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. The proposed project is also expected to encourage continued public use of waters and would facilitate the potential future restoration of marina uses at Pier 2. Therefore, the proposed project would be consistent with this subpolicy.

2.3 Provide infrastructure improvements necessary to support working waterfront areas.

Infrastructure improvements would not be an element of the proposed project; therefore, this subpolicy is not applicable.

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

3.1 Support and encourage recreational and commercial boating in New York City's marine centers.

The proposed project would be located within an area of Flushing Bay that supports recreational boating, specifically the New York City Department of Parks and Recreation's (DPR) World's Fair Marina, which has two active piers (Piers 1 and 3) within or in close proximity to the proposed project area. A third pier, Pier 2, which is located within the limits of the proposed project area, has not been active for several years.

The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. Approximately 70 boat slips at Pier 3 would be temporarily displaced during construction;

however, the proposed project includes provisions to provide access to Pier 3 and its facilities for boat owners to the extent practicable. Upon completion of the proposed project, the relocated boat slips and docks would be restored to their original location.

The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. The proposed project is also anticipated to encourage continued public use of waters and would facilitate the potential future restoration of marina uses at Pier 2. Therefore, the proposed project would be consistent with this subpolicy.

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

See response to Subpolicy 3.1. DEP would coordinate closely with DPR to minimize impacts to recreational traffic at the World's Fair Marina, as well as the U.S. Coast Guard (USCG) to minimize potential conflicts with marine navigation. Construction activities would be short-term and temporary in duration and would not present a significant adverse impact to existing vessel traffic. Additionally, the proposed project would not add any permanent structures or vessels within the bay. Therefore, the proposed project would be consistent with this subpolicy.

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

The proposed project would not result in a long-term change in existing commercial or recreational boating activities; therefore, this subpolicy is not applicable.

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

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.

Based upon a review of Special Natural Waterfront Areas (SNWAs), Recognized Ecological Complexes and the NYSDOS-mapped Significant Coastal Fish and Wildlife Habitats (SCFWH) information, the proposed project area is located within the East River - Long Island SNWA. However, it is not within or proximate to a Significant Coastal Fish and Wildlife Habitat.

The proposed project would be temporary and short-term in duration. Therefore, potential effects on the benthic community found in the immediate vicinity of the proposed project area would not be permanent or significant and would instead be temporary. The benthic communities within the proposed project area are impaired, comprised primarily of pollution-tolerant species and display lower levels of taxa richness and diversity in comparison to those from less disturbed reference areas. The proposed project would remove existing accumulated sediment mounds within the proposed project area. While the remaining sediment would be largely comparable in its characteristics to the material removed, it is expected that the areas that are dredged would readily re-colonize over time, thus supporting a benthic community comparable to that presently found within reference areas located in the inner bay but outside the proposed project area. A minor improvement to the benthic community within the proposed project area may be realized through improved water circulation and larger areas that would be subtidal through the tidal cycle. Potential impacts to the existing benthic community are

therefore anticipated to be temporary and short-term in duration and therefore, the proposed project would be consistent with this subpolicy.

4.2 Protect and restore tidal and freshwater wetlands.

The proposed project would occur in the inner bay portion of Flushing Bay along the southern edge of the bay. In this area, the entire length of the shoreline is stabilized by a riprap-armored embankment. A review of the New York State Department of Environmental Conservation (NYSDEC) tidal wetlands and the United States Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) maps was conducted to determine the presence of wetlands within the proposed project area. The proposed project area is predominantly a NYSDEC-designated littoral zone wetland. Littoral zones exist within waters that are less than six feet deep at mean low water (MLW). There are also un-mapped vegetated intertidal marsh and mudflat wetlands along the shoreline of the proposed project area that were identified during field investigations. No mapped freshwater wetlands exist at or in the vicinity of the proposed project area.

A formal wetland delineation was completed in December 2011 that identified intertidal salt marsh, comprised of saltmarsh cordgrass (*Spartina alterniflora*), and mudflats in or adjacent to the dredge area. The proposed project limits were developed in order to minimize potential direct impacts to these intertidal marsh areas. Existing littoral zone wetlands would be temporarily impacted during dredging activities; however, the habitat would remain as littoral zone after completion of the proposed project, as water depths would remain less than six feet at MLW. The proposed project would result in a loss of approximately 2.3 acres of tidally-exposed mudflat wetlands. However, as part of the proposed project, on-site wetland restoration would occur.

The proposed restoration plan was developed in consultation with NYSDEC and would involve the development of intertidal and high marsh habitat with *Spartina alterniflora* and salt meadow cordgrass (*Spartina patens*). A component of the restoration would consist of the removal of existing shoreline soils and subsequent filling along the shoreline with clean sand in order to create a correct tidal profile and rooting medium for the wetland planting area from MLW to mean high water (MHW). The proposed wetland restoration program would create approximately 3.18 acres of wetlands, comprised of 0.28 acres of mudflat, 2.33 acres of intertidal marsh, and 0.57 acres of high marsh habitat in areas of predominately un-vegetated intertidal mudflats.

Overall, the proposed project would result in an overall enhancement to wetlands along the shoreline. During active construction (dredging), temporary disturbance to sediments could potentially occur. A turbidity curtain would be used during active construction to minimize potential impacts to natural resources in the proposed project area. Therefore, the proposed project would be consistent with this subpolicy.

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.

A review of the NYSDEC Natural Heritage Program database did not indicate the presence of any threatened, endangered or species of special concern within Flushing Bay or in the immediate vicinity. No significant upland work would occur under the proposed project. An Essential Fish Habitat (EFH) analysis identified eight EFH-designated species (winter flounder, bluefish, windowpane, summer flounder, scup, black sea bass, red hake, and butterfish) that would have the potential to be impacted by the proposed project. In addition, NYSDEC

indicated in a letter dated May 10, 2012 that a waiver of the environmental windows for striped bass and winter flounder would be granted for the proposed project. Impacts on these species would be temporary and short-term in duration, would not be significant and, upon project completion, habitat value of this portion of Flushing Bay would be improved. Therefore, the proposed project would be consistent with this subpolicy.

4.4 Maintain and protect living aquatic resources.

See responses to subpolicies 4.2 and 4.3.

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

5.1 Manage direct or indirect discharges to waterbodies.

The proposed project would remove accumulated sediment mounds from Flushing Bay. During construction, potential discharge of dredged material dewatering filtrate would be within an area that is delimited by turbidity curtains. Additionally, potential release of decant waters from a dewatering barge would only occur after the material has settled for at least 24 hours, and would also be discharged within the limits of the turbidity curtains. The use of a spill plate between barges or other appropriate measures during the potential transloading of dredged materials would also reduce the potential for the loss of materials during transfer. The proposed project would remove exposed sediment mounds and would restore wetlands along the shoreline and is expected to improve water quality. Therefore, the proposed project would be consistent with this subpolicy.

5.2 Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.

The proposed project would not generate or contribute any nonpoint source pollution. Therefore, this subpolicy does not apply.

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

During construction, a turbidity curtain would be installed around the proposed project area to minimize potential impacts to water quality from the resuspension of sediments. In addition, filtrate water from dredge material dewatering activities, if hydraulic dredging is used, would be discharged to Flushing Bay within the limits of the turbidity curtain. Potential release of decant waters from dredge spoil barges used for mechanical dredging would only be conducted after standing for more than 24 hours and would also occur within the limits of the turbidity curtains. Therefore, the proposed project would be consistent with this subpolicy.

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

No surface or groundwater located at the site constitutes a primary source of water supply and no adverse impacts on these resources would occur from the proposed project. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. Therefore, the proposed project would be consistent with this subpolicy.

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

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.

A review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the proposed project area indicates that the proposed project would occur within a Special Flood Hazard Area (Zone AE) that is subject to flooding by the one (1) percent annual chance flood (100-year flood). The proposed project would not alter floodplain areas or hydrology and thus, there would be no effect on flooding or erosion potential. Therefore, the proposed project would be consistent with this subpolicy.

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

This subpolicy is not applicable.

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

This subpolicy is not applicable.

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

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.

Dewatered or stabilized dredged materials from the proposed project area would be considered a regulated solid waste requiring upland disposal at a licensed facility. Management of all dredged materials would be conducted in accordance with federal, state and local rules and regulations for the transport, treatment and disposal of these materials. Therefore, the proposed project would not result in impacts to the environment and would be consistent with this subpolicy.

7.2 Prevent and remediate discharge of petroleum products.

The proposed project would not involve the discharge of petroleum products. The use of these products by the contractor for the maintenance of equipment during construction would be in accordance with applicable federal, state and local regulations. Therefore, the proposed project would be consistent with this subpolicy.

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 project would not involve the siting of a solid or hazardous waste management facility. Dewatered and/or stabilized dredged materials would be transported by barge to a licensed dredged material management and/or disposal facility in accordance with applicable federal, state and local regulations. Therefore, the proposed project would be consistent with this subpolicy.

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

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

See subpolicy 3.1. Dredging activities would be closely coordinated with DPR to minimize impacts to recreational activities in the World's Fair Marina and the adjacent park and waterfront promenade, particularly during peak use (i.e., summer months).

The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. The proposed project is also expected to encourage continued public use of Flushing Bay and would facilitate the potential future restoration of marina uses at Pier 2. The proposed project would not result in permanent impacts to recreational resources and would, therefore, be consistent with this subpolicy.

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 involve new upland development or preclude future development that may incorporate public access. Therefore, this subpolicy is not applicable.

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

The proposed project would not affect the visual access to coastal lands, waters and open space. Therefore, this subpolicy is not applicable.

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

See response to subpolicy 8.1.

8.5 Preserve the public interest and use of lands and waters held in public trust by the state and city.

See response to subpolicies 8.1 and 8.4.

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

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

The proposed project would remove accumulated sediment mounds that are currently exposed at low tide and would improve the visual aesthetics of the waterbody in this area. Therefore, the proposed project would be consistent with this subpolicy.

9.2 Protect scenic values associated with natural resources.

See response to subpolicy 9.1.

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

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

According to the New York State Historic Preservation Office (SHPO) and the New York City Landmarks and Preservation Commission (LPC), neither the proposed project area nor surrounding area has known or expected significant historic, architectural or archaeological resources. Therefore, this subpolicy is not applicable.

10.2 Protect and preserve archaeological resources and artifacts.

See response to subpolicy 10.1. ✷

Section C: Socioeconomic Conditions

A. INTRODUCTION

The 2012 *CEQR Technical Manual* defines socioeconomic character as the population, housing and economic characteristics of an area. Socioeconomic impacts can occur either directly (on-site displacement of residents or businesses) or indirectly (change in socioeconomic conditions that results in the off-site displacement of residents, businesses, or employees). The *CEQR Technical Manual* states that a socioeconomic impact assessment should be conducted if a project may reasonably be expected to result in direct or indirect socioeconomic impacts. The following assessment has been prepared following the guidance and methodologies of the 2012 *CEQR Technical Manual*. The following assesses the existing socioeconomic conditions in the proposed project area and within the study area, describes conditions in the future without the proposed project (No Action Condition), and assesses whether the proposed project (With Action Condition) would result in potential significant adverse socioeconomic impacts, particularly with respect to maritime and commercial uses within and adjacent to the proposed project area.

B. METHODOLOGY

According to the *CEQR* Technical Manual, socioeconomic analysis study area boundaries are typically similar to the land use study area. The land use study area extends ½ mile from the proposed project area (see Section B, "Land Use, Zoning, and Public Policy").

The proposed project would require the temporary relocation of a portion of the World's Fair Marina's Pier 3 docks and boat slips within the proposed project area, which has the potential for indirect effects on the marina's associated concessions. Therefore, this analysis focuses on the potential for the proposed project to detract from, impede, or otherwise diminish the business operations in the marina and/or the study area. These businesses are limited to the World's Fair Marina and the World's Fair Marina concession that are operated along the south and west waterfronts of Flushing Bay.

For many socioeconomic analyses, information on retail sales, employment, wages, and other indicators of business performance and characteristics are obtained from the U.S. Census Bureau, the Bureau of Labor Statistics, the Bureau of Economic Analysis, local business development corporations, and the New York State Department of Labor. However, the businesses that are the subject of this analysis are unique waterfront operations and are geographically isolated. Therefore, these typical sources of information were not applicable. In this case, the principal sources of information were field surveys, consultations with business owners and data from DPR.

C. EXISTING CONDITIONS

INTRODUCTION

The businesses that are the subject of this analysis are part of the World's Fair Marina complex. In addition to marina operations, the World's Fair Marina complex includes the World's Fair Marina Restaurant and Banquet Hall, the World's Fair Café and Fuel Dock, and the private commercial charter and excursion boats that operate from Pier 1. These businesses are listed in **Table C-1** and are described below.

Table C-1
Existing Businesses and Estimated Employment within and Adjacent to the Proposed Project Area

Business	Uses/Activities	Estimated Employment
World's Fair Marina	Recreational and commercial boating facility with supporting service	5-10
Pier 1 Commercial Vessels[1]	Commercial excursion and recreational fishing charter boats	100-120 **(a)**
World's Fair Marina Restaurant and Banquet Hall[2]	Catering facility	40-55 **(c)**
World's Fair Café and Fuel Dock	Marine fueling and café	2-5 **(b)**
Total		**147-190**

Notes: (1) Assumes up to 8 commercial vessels with an average or 10-15 employees per vessel. (2) An additional 20-25 persons may work part time at special events.
Sources: (a) AKRF, May 2012; (b) Telecommunication with DPR (May 30, 2012); (c) Telecommunication with banquet hall operator (June 12, 2012).

MARINA USES AND ACTIVITIES

RECREATIONAL AND COMMERCIAL DOCKAGE

The World's Fair Marina is comprised of three piers: Piers 1, 2, and 3. Piers 1 and 3 are operational and operated by DPR. Pier 2 is deteriorated and unoccupied due to long term sedimentation that eventually precluded ongoing use as an active marina. Piers 1 and 3 are located along the south and west waterfronts of Flushing Bay, respectively (see **Figures B-12 through B-14**). The World's Fair Marina is one of three DPR-operated marinas in New York City (the others are Sheepshead Bay Piers in Brooklyn and the West 79th Street Boat Basin in Manhattan).

The marina piers are used for dockage of both recreational and commercial vessels. Pier 1 is the largest pier in the marina and is open to the general public as well as seasonal and transient permit holders who pay for dockage. Seasonal permit holders include commercial charters, private recreational boaters and crew teams. While the pier is publicly accessible, access to the docks is controlled and limited to boat owners and their guests. Pier 3 is used for seasonal recreational boat dockage and has gate-controlled access from the waterfront promenade. Access is granted only to boat owners and their guests. The marina's administration building is located immediately upland of Pier 3. The offices for DPR's Marine Division, a concession and the World's Fair Marina Restaurant and Banquet Hall are all housed inside the administration building.

The marina provides a total of approximately 300 boat slips, 20 transient slips and 10 commercial slips. Of these, about 200 seasonal slips are provided at Pier 3. Pier 1 is immediately

southeast of the proposed project area and serves as the main public pier in the World's Fair Marina complex by providing access for the general public. Pier 1 provides a water taxi landing, 10 commercial slips, a gas dock/pump-out station, picnic tables, a designated fishing area, the World's Fair Café, kayak launches and recreational and larger commercial charter boat dockage. Larger excursion and charter boats dock along the north side of Pier 1 while the interior dockage is used by private recreational sail and power craft. Recreational kayak and crewing teams (e.g., dragon boat teams) also use the dockage at Pier 1.

Transient dockage is popular during New York Mets games and special events at Citi Field, as well as during the US Open held at the United States Tennis Association Billie Jean King National Tennis Center in Flushing Meadows-Corona Park. The water taxi landing is utilized by New York Water Taxi, which operates ferries from Pier 11-Wall Street to Citi Field, and Seastreak, which operates cruises to some Mets games. These ferries run on game days during baseball season and during the U.S. Open (May through October). During good weather or during a Mets game, the marina attracts about 25 transient boaters. The dockage fee of $2/linear foot/day is typically less expensive than other marinas in the area. The special event rate is $1/linear foot for the duration of the event. Access to the 7 train is available, in addition to overnight amenities (showers, free ice machine and washer/dryer).

Pier 3 contains 200 slips for dockage of seasonal and recreational boaters. Pier 3 also contains marina maintenance support facilities, machinery and equipment. A travel lift service is located on the north side of Pier 3. Secure parking is also provided upland of Pier 3, as is upland winter storage for boats.

The marina has about 5-10 full-time employees which includes DPR administrative personnel and a Chief Dockmaster. The office is staffed the entire year, 24 hours a day and seven days a week. Specific services and amenities at the marina include:

- Utility and security services with high-capacity electrical connections providing 30, 50 and 100AMP service.
- The World's Fair Marina sells both gasoline and diesel fuel. The fuel dock is open from 7am to 7pm, seven days a week from April 15 to November 15. Snacks and beverages are also available for purchase at the café. The café is available to both boaters and the general public.
- A free vessel holding tank pump-out station is located adjacent to fuel dock at Pier 1 and is also operated from 7am to 7pm, seven days a week.
- A 50-ton vessel travel lift with a crane operates from Pier 3 and provides vessel haul-out and launch. This is maritime services equipment used for both major and minor boat repairs, including engine and structural overhaul, and emergency repairs.
- Winter storage is available both in the water and upland (the World's Fair Marina maintains a waiting list for the winter dry storage spots).
- Parking permits are available for the secured parking area near Pier 3. Open public parking is available in two surface lots situated between Piers 1 and 3. Total parking in these lots is about 600 spaces and they are available to the commercial and recreational boaters, as well as their patrons and guests. This is an amenity for both the recreational and commercial vessels that use the marina.

COMMERCIAL MARITIME OPERATIONS

In addition to the recreational boats, the World's Fair Marina provides dockage for commercial boat charters that include fishing and dinner/excursion cruises that depart from Pier 1. The commercial vessels are larger and dock on the outer slips at the end of Pier 1 in deeper water. These charter boats provide the general public with the opportunity to enjoy the City's waterways. Among the charter boats that lease space at the marina are the Skyline Princess Cruises, Paddle Wheel Queen, Never Enuff Fishing (open fishing boat), Brandon Boat Charters, and Marco Polo Cruises. According to DPR, the charters operate as soon as the warms (late

spring) and generally run into the night. Charters are also popular during the baseball and tennis seasons. Commercially-operated water taxis also use Pier 1 during baseball, tennis and concert events and are granted secure access after park hours.

CONCESSIONS

The World's Fair Marina facility includes two concessions: the World's Fair Café and Fuel Dock at the end of Pier 1 and the World's Fair Marina Restaurant and Banquet Hall upland of Pier 3. These are businesses that operate on City parkland and generate revenue through a permit or license agreement with DPR's Revenue Division.

The World's Fair Café and Fuel Dock employs approximately 2-5 persons.[1] The fuel dock is a revenue generator and support facility for boaters. The snack bar is open both to boaters and the general public and offers light fare (e.g., hot dogs, sandwiches), snacks and beverages.

The World's Fair Marina Restaurant and Banquet Hall is strictly a catering facility and hosts weddings, proms and other special events. The 50-500 person facility is open all year and is generally busiest from April through October and Thanksgiving through Christmas (peak season). The slowest months are from January through March (off season). The facility has between 40 and 55 employees with additional part-time staff (20-25 persons) during events[2]. The World's Fair Marina Restaurant and Banquet Hall offices are open seven days a week from 12pm until 8pm. The banquet hall itself is open per the event schedule.. The busiest days are Tuesday through Sunday during the peak season and Thursday through Sunday during the off peak season. There is also a small outdoor garden with a fountain and canopy adjacent to the banquet hall building that is used for outdoor events during the peak season from April through October [3].

USAGE AND PEAK PERIODS

Based on discussions with DPR staff, there is an increase in marina activity that begins in mid to late spring (April to June) when vessels in upland dry storage are readied and launched. Usage increases again at the end of the season in late August through the end of September when boats are hauled for winter storage or are prepped for in-water storage. During the summer there is the steady operational demand of managing transient vessels and providing services for boats that come in for repairs and utilize the 50-ton vessel travel lift and maintenance facilities. Transient activity is heaviest from June through October. The commercial vessels are also more heavily patronized in the summer (July and August).

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[1] Telecommunication with DPR, May 30, 2012.

[2] Telecommunication with World's Fair Banquet Hall Operator, June 12, 2012.

[3] Telecommunication with World's Fair Banquet Hall Operator, June 12, 2012.

REVENUE

The marina revenues go directly to the City's general fund. The marina provides surplus revenue (i.e., revenue that exceeds its operational costs) which is in part attributable to the availability of boat services (e.g., boat hauling, repair, fueling) that provides a supplemental source of revenue to the docking fees. According to DPR staff, revenues have generally been increasing over the past several years. On average, approximately two-thirds of the revenue covers expenses (labor and operational expenses), with the balance as surplus revenue.

STUDY AREA UPLAND BUSINESSES

As discussed in Section B, "Land Use, Zoning, and Public Policy," other commercial uses in the study area are some distance from the proposed project area and are located to the west along Northern Boulevard. Northern Boulevard provides a variety of neighborhood retail uses, including delis, restaurants, fast food outlets, small offices and gas stations. Astoria Boulevard also has a few neighborhood commercial and auto-related businesses. In the northwest corner of the study area, there is a concentration of hotels along Ditmars Boulevard and across from LaGuardia Airport that primarily serve patrons of the airport. The hotels include a Hampton Inn, Holiday Inn, and Marriott. There is also a new hotel under construction on Northern Boulevard and 112th Street.

D. FUTURE WITHOUT THE PROPOSED PROJECT

PROPOSED PROJECT AREA

Under the No Action Condition, no changes to water uses are expected within the proposed project area. Conditions at Piers 2 and 3 in the World's Fair Marina are expected to remain unchanged with the exception of improvements in maritime infrastructure that DPR would undertake as part of its regular maintenance and repair operations. DPR has no plans at this time to reactivate Pier 2. The deteriorated Pier 2 is adjacent to outfall BB-006 and has not been used for several years. There would also be no removal of accumulated CSO sediments and deposition of CSO sediments would continue to occur in the proposed project area.

ADJACENT AREA

In the future without the proposed project, there are no proposed changes to land or water uses adjacent to the proposed project area. Conditions at Pier 1 in the World's Fair Marina are expected to remain unchanged with the exception of improvements in maritime infrastructure that DPR would undertake as part of its regular maintenance and repair operations. Conditions along the waterfront promenade and at the World's Fair Marina Restaurant and Banquet Hall are also expected to remain unchanged.

STUDY AREA

In the future without the proposed project, no major changes in socioeconomic conditions are expected in the study area.

E. FUTURE WITH THE PROPOSED PROJECT

DIRECT BUSINESS DISPLACEMENT

The waterfront businesses that could potentially be affected by the proposed project provide products or services that are essential to the local community and it is likely that these services

would not be replaced if they were displaced. However, the proposed project would not either permanently or temporarily displace the World's Fair Marina or its concessions.

The proposed project would be performed in the waters adjacent to Piers 2 and 3. The study area encompasses Pier 1; however, no dredging is proposed adjacent to Pier 1. An objective of the proposed project is to avoid and minimize impacts to the active DPR marina facilities at Pier 3. However, certain marina facilities may need to be temporarily relocated. To provide access for the dredging equipment, the proposed project would require the temporary removal and replacement of approximately 1,630 linear feet of floating docks and the temporary displacement of 70 boat slips at Pier 3 during construction. The proposed project includes provisions to provide access to Pier 3 and its facilities for boat owners to the greatest extent practicable. Upon completion of the proposed project, the relocated boat slips and dock would be restored to their original location (see **Figure B-8**). Boaters would not be denied access to their boats at any time during construction, because the proposed project includes provisions to provide access to Pier 3 and its facilities. The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. In addition, a number of existing timber anchor piles at both Piers 2 and 3 would need to be removed, as they pose potential constraints to proposed project vessel navigation and other operations necessary to perform the required dredging.

The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. Overall, the proposed project would provide benefits to marina operations and is not expected to result in any impacts with respect to direct business displacement. Therefore, the proposed project would not result in potential significant adverse socioeconomic impacts.

INDIRECT BUSINESS DISPLACEMENT

Other study area businesses are not expected to be indirectly affected by the proposed project. Under the proposed project, the project contractor would ensure that project barges and the associated operations would not interfere with navigation in the bay or operations at LaGuardia Airport. Any air quality or noise impacts during construction would be temporary and would not result in potential significant adverse impacts.

Therefore, the proposed project would not result in potential significant adverse socioeconomic impacts with respect to indirect business displacement.

PUBLIC POLICY

The World's Fair Marina is part of the City's working waterfront which is identified in the WRP as important for protecting and supporting waterfront commercial businesses and public access to the water. The proposed project includes provisions to provide access to Pier 3 and its facilities for boat owners to the extent practicable. The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. The temporary displacement of the Pier 3 gangway, floating docks and 70 boat slips would not be a significant impact on this operation. Upon completion of the proposed project, the Pier 3 docks and boat slips would be restored at their original locations (see **Figure B-8**). Impacts on DPR facilities and relocation of access would therefore be temporary and short-term in duration and would not be expected to result in any significant adverse impacts to the marina or public access to or along the waterfront. Therefore,

the proposed project would not result in potential significant adverse socioeconomic impacts and would not conflict with the City's WRP objectives for its working waterfront businesses (see also Section B, "Land Use, Zoning, and Public Policy"). ✷

A. INTRODUCTION

The 2012 *CEQR Technical Manual* states that a detailed open space analysis should be conducted when a proposed project could result in a potential direct open space impact (e.g., the physical loss or alteration of a public open space), or an indirect impact on open space that may result from added demands.

Because the proposed project area is located within a DPR open space area, an open space impact assessment is warranted to determine whether it could affect the usability of the open space, detract from its aesthetic qualities, or impair its functions. This analysis follows this guidance of the *CEQR Technical Manual* and describes the existing open space and user population conditions in the proposed project area and within the study area, describes conditions in the future without the proposed project (No Action Condition), and assesses the potential impacts that may result from the proposed project (With Action Condition). As per the *CEQR Technical Manual*, the assessment includes all open spaces that are accessible to the public on a constant and regular basis with a focus on those recreational facilities and open spaces within and adjacent to the proposed project area.

B. METHODOLOGY

According to the *CEQR Technical Manual*, direct impacts may occur when the proposed project would encroach upon, or cause a reduction in open space. Direct impacts may also occur if recreational facilities are altered or modified such that they no longer serve the user population. Limitations of public access and alterations to the type and amount of public open space are also considered direct impacts.

Indirect impacts occur when the population generated by a project significantly increases demands on existing open spaces such that the availability of open space acreage per-person is substantially diminished. The proposed project would not generate any additional population or employees that would place added demands on open spaces and therefore, no further consideration of indirect effects on open space is necessary for this analysis.

PRELIMINARY ASSESSMENT

Per the *CEQR Technical Manual*, projects that could have a direct effect on a specific type of open space, but would not introduce a significant new population, a targeted open space analysis focused on the affected resources should be conducted. The proposed project has the potential to affect approximately 16.8 acres of water area in Flushing Bay including Pier 3 of the DPR-operated World's Fair Marina and the adjacent waterfront promenade. This analysis is therefore targeted toward these potentially affected resources.

STUDY AREA DELINEATION

Consistent with the *CEQR Technical Manual*, a ½-mile study area was used (see **Figure B-15**). This study area was established to identify the potential user population of the waterfront promenade and the other open spaces that may be available in the local community.

CENSUS DATA

As recommended by the *CEQR Technical Manual*, this open space analysis includes all census tracts that are 50 percent or more within the study area (see **Figure B-15)**. All public open spaces within the study area were also mapped (see **Figure B-15)**.

DATA INVENTORY

STUDY AREA POPULATION

Consistent with the *CEQR Technical Manual*, data on the study area population was compiled by age group and is used to indicate open space needs within a community.

OPEN SPACE RESOURCES AND USAGE

Consistent with the *CEQR Technical Manual*, publicly accessible open space and recreational facilities in the study area were identified and described based on information from DPR, interviews with DPR staff, New York City Department of Information Technology & Telecommunications (DOITT) information, and data collected during field surveys conducted between April and September 2012. The *CEQR Technical Manual* defines public open space as space that is accessible to the public on a constant and regular basis. Public open space may be private or publicly owned. The *CEQR Technical Manual* recommends that open space information be obtained from at least two field investigations, at least one of which is at the peak hour of use and in good weather. Open space surveys along the waterfront promenade were conducted several times, on various days in April through September 2012. The surveys were performed during midday (12pm–2pm) and evening (5pm–7pm) time periods and when events were being held at Citi Field. The hours chosen for the surveys were selected based on conversations with DPR staff to determine peak hours of open space use for the study area open spaces, and to capture both daytime and evening open space activity at times that would correlate with the proposed project.

Based on the methodologies of the *CEQR Technical Manual*, the intensity of open space use and equipment usage was determined during the field observations. The *CEQR Technical Manual* suggests that open spaces with less than 25 percent of utilized space or equipment be categorized as low usage; those with 25 to 75 percent utilization are classified as moderate usage; and those with over 75 percent utilization are considered heavily used.

At each open space, active and passive recreational acreages were determined. Active open space acreage is used for activities such as jogging, field sports, and children's active play, which includes basketball courts, baseball fields, and equipment. Passive open space usage includes strolling, reading, sunbathing, and enjoying the park benches. Some spaces, such as public esplanades, can be considered to provide both active and passive recreation spaces since they can be used for passive activities such as sitting or strolling, or active uses, such as jogging or biking.

Descriptions of study area open spaces were determined in conjunction with the land use and natural resources analyses (see Section B, "Land Use, Zoning, and Public Policy," and Section E, "Natural Resources").

OPEN SPACE RATIOS AND PLANNING STANDARDS

According to the *CEQR Technical Manual*, open space ratios vary widely across the City, but the median ratio is 1.5 acres of open space per 1,000 residents. As a planning benchmark, a ratio of 2.5 acres per 1,000 residents represents a well-served area. Total acreage is ideally comprised of 0.5 acres of passive open space and 2.0 acres of active open space. It is recognized that the City's open space goals are not attainable for many neighborhoods. Therefore, the City does not consider these ratios to be open space policy for every neighborhood, and they do not constitute an impact threshold. Rather, these ratios indicate how well an area is served by open space. This analysis quantifies the existing open space ratio in the study area in order to identify the open space needs of the local community.

C. EXISTING CONDITIONS

STUDY AREA POPULATION

RESIDENTIAL POPULATION

As shown in **Figure B-15**, the study area includes Queens Census Tracts 365, 367, 371, 373, and 381 (Census Tract 383.02 is excluded since it does not contain any residents). The proposed project study area extends to approximately 126th Street on the east, 25th Avenue on the west, Roosevelt Avenue to the south, and LaGuardia Airport to the north. Based on 2010 Census data, the study area has a total population of 17,498 persons.

As shown in **Table D-1**, adults between the ages of 20 and 64 represent approximately 63.6 percent of the study area population, which is similar to the borough and City as a whole, which are 63.9 and 63.4 percent, respectively. Compared with Queens and the City, the study area has a lower proportion of residents who are 65-and-over (approximately 7.6 percent compared with approximately 12.8 and 12.1 percent in Queens and New York City, respectively) and a greater proportion of children between ages 5 and 19. In total, approximately 28.8 percent of the study area population is under 19 years of age, as compared with 23.3 percent in Queens and 24.5 percent in the City.

Table D-1
Percent Distribution of Age Groups in the Study Area

Census Tract	Total Pop.	Under 5 Years		5 to 9 Years		10 to 14 Years		15 to 19 Years		20 to 64 Years		65 Years and Older	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
365	3,885	341	8.8	297	7.6	231	5.9	319	8.2	2,513	64.7	184	4.7
367	2,676	161	6.0	155	5.8	179	6.7	223	8.3	1,642	61.4	316	11.8
371	1,597	86	5.4	93	5.8	109	6.8	127	8.0	976	61.1	206	12.9
373	2,532	196	7.7	177	7.0	153	6.0	223	8.8	1,596	63.0	187	7.4
381	6,808	594	8.7	531	7.8	406	6.0	439	6.4	4,409	64.8	429	6.3
Study Area Total	**17,498**	**1,378**	**7.9**	**1,253**	**7.2**	**1,078**	**6.2**	**1,331**	**7.6**	**11,136**	**63.6**	**1,322**	**7.6**
Queens	**2,230,722**	**132,464**	**5.9**	**123,766**	**5.5**	**123,406**	**5.5**	**139,096**	**6.2**	**1,425,844**	**63.9**	**286,146**	**12.8**
New York City	**8,175,133**	**517,724**	**6.3**	**473,159**	**5.8**	**468,154**	**5.7**	**535,833**	**6.6**	**5,187,105**	**63.4**	**993,158**	**12.1**

Source: U.S. Census Bureau, *Census 2010*.

OPEN SPACE RESOURCES

Table D-2 lists and describes the study area public open space resources and **Table D-3** identifies those with managed or controlled access. A photo location key (see **Figure B-16**) and photographs of the public open space along the Flushing Bay waterfront are provided in **Figures B-17 through B-23**.

Table D-2
Study Area Public Open Spaces

Map ID No.[1]	Owner/ Agency	Features	Total Acres in Study Area	Active Acres	Passive Acres	Condition[2]	Utilization
Flushing Meadows-Corona Park—Flushing Bay Promenade	DPR	Benches, shade trees, waterfront promenade, parking	2.4	1.2	1.2	Acceptable	Low-Moderate
Flushing Meadows-Corona Park—World's Fair Marina (Public Pier 1)	DPR	Fishing pier, recreational and commercial boat docks, café, parking	2.00	1.00	1.00	Acceptable	Low-Moderate

Notes:
1. See **Figure B-15** for open space resources.
2. Based on AKRF Field Surveys and the latest DPR inspection ratings available on DPR's website, last accessed on April 6, 2012.
3. Open space in the median cannot be counted since it I not publicly accessible

Sources: AKRF Field Surveys, April 2012 through September 2012; DPR website, April 2012; NYC DoITT GIS data.

Table D-3
Study Area Open Spaces—Managed Access

Name	Owner/ Agency	Features	Total Acres	Active Acres	Passive Acres	Condition	Utilization
Flushing Meadows-Corona Park—World's Fair Marina (Pier 3)	DPR	Private boat dock, boat launch, parking	2.00	1.00	1.00	Acceptable	Boat owners and guests
Citi Field	DPR	Baseball stadium, restaurants and snack bars, event space, parking lot	56.00*	23.00	23.00	Good	Sports and Special Events
		Total	**58.00**	**24.00**	**24.00**	n/a	n/a

Notes:
1. See **Figure B-15** for open space resources.
*A sizable portion of this area includes parking.

Sources: AKRF Field Surveys, April 2012 through September 2012; DPR website, April 2012; NYC DoITT GIS data.

PUBLIC OPEN SPACE

Flushing Meadows-Corona Park

Much of the study area open space, including the waterfront promenade and the World's Fair Marina, is within Flushing Meadows-Corona Park, a major recreational and cultural destination for Queens's residents and visitors from throughout the City and New York metropolitan area. The 1,255-acre park is generally bounded by the Grand Central Parkway on the west, the Van Wyck Expressway on the east, Flushing Bay to the north, and Union Turnpike to the south. The park provides extensive recreational facilities including soccer fields, basketball courts, bicycle paths and greenways, a golf course, handball courts, dog runs, playgrounds, soccer fields, tennis courts, and kayak/canoe launch sites. The portion of the park that is within the study area includes the Flushing Bay waterfront, the waterfront promenade, the World's Fair Marina, and Citi Field, all of which are described below.

Waterfront Promenade

The waterfront promenade extends along the south and west shorelines of the bay, between Flushing Creek on the east and LaGuardia Airport on the north. The waterfront promenade was developed in conjunction with the 1939 World's Fair and was reconstructed for the 1964/65 World's Fair. It is about 1.45 miles long and includes seven overlooks that provide views of the bay. Amenities include 17 drinking fountains and over 1,200 linear feet of benches. Nearly six acres of new sod were installed during the last renovation (circa 2003), along with approximately 1,040 trees and 11,000 shrubs that provide shade and greenery. In addition, 575,000 square feet (about 13.16 acres) of new pedestrian and vehicular pavements were installed.[1]

In addition, there is a public boat launch at the east end of the waterfront promenade for small powerboat, kayak, and canoe owners. The launch, which includes a dock, is open for public use from one hour after dawn to one hour before dusk between April 15 and November 15. A permit is required to launch powerboats, kayaks and canoes. Permits are available for a nominal fee of $15. Other than the boat launch, there are no formal recreational facilities along the waterfront promenade (e.g., courts, play areas).

The waterfront promenade also features a number of artistic elements. For example, each overlook is marked by eight graphic panels designed by artist Gregg LeFevre. The panels depict one plant and one animal species for each letter of the alphabet, with an additional panel at the start and end of the waterfront promenade.[2] Along the eastern portion of the waterfront promenade, near the World's Fair Marina Pier 1, artist Jackie Ferrara also enhanced the two white shade structures, with a complimentary abstract geometric paving pattern (known as the Candela structures for artist Felix Candela who designed them for the 1964/65 World's Fair). Ferrara's design also included new benches.[3]

During the field investigations, persons observed using the waterfront promenade generally included walkers, joggers, bicyclists and passive users who sat and enjoyed the views of the bay. As discussed below under "Field Surveys and Park User Data," observed use of the waterfront promenade was generally low to moderate, depending on the season. The parking areas were often observed in use during the day by livery cab drivers and others who were resting or sometimes washing cars. Signage indicates that this parking is also used for patrons of the Pier 1 excursion vessels.

World's Fair Marina

The World's Fair Marina is comprised of three piers: Piers 1, 2, and 3. Piers 1 and 3 are operational and operated by DPR. Pier 2 is deteriorated and unoccupied due to long term sedimentation that eventually precluded ongoing use as an active marina. Piers 1 and 3 are located along the south and west waterfronts of Flushing Bay, respectively (see **Figures B-12 through B-14**). The World's Fair Marina is one of three DPR-operated marinas in New York City (the others are Sheepshead Bay Piers in Brooklyn and the West 79th Street Boat Basin in Manhattan).

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[1] City of New York Department of Parks and Recreation. "Flushing Meadows-Corona Park." Date accessed: April 6, 2012. http://www.nycgovparks.org/parks/fmcp/highlights/10388.

[2] City of New York Department of Parks and Recreation. "Flushing Meadows-Corona Park." Date accessed: April 6, 2012. http://www.nycgovparks.org/parks/fmcp/highlights/10388.

[3] *Ibid.*

The marina piers are used for dockage of both recreational and commercial vessels. Pier 1 is the largest pier in the marina and is open to the general public as well as seasonal and transient permit holders who pay for dockage. Seasonal permit holders include commercial charters, private recreational boaters and crew teams. While the pier is publicly accessible, access to the docks is controlled and limited to boat owners and their guests. Pier 3 is used for seasonal recreational boat dockage and has gate-controlled access from the waterfront promenade. Access is granted only to boat owners and their guests. The marina's administration building is located immediately upland of Pier 3. The offices for DPR's Marine Division, a concession and the World's Fair Marina Restaurant and Banquet Hall are all housed inside the administration building.

The marina provides a total of approximately 300 boat slips, 20 transient slips and 10 commercial slips. Of these, about 200 seasonal slips are provided at Pier 3. Pier 1 is immediately southeast of the proposed project area and serves as the main public pier in the World's Fair Marina complex by providing access for the general public. Pier 1 provides a water taxi landing, 10 commercial slips, a gas dock/pump-out station, picnic tables, a designated fishing area, the World's Fair Café, kayak launches and recreational and larger commercial charter boat dockage. Larger excursion and charter boats dock along the north side of Pier 1 while the interior dockage is used by private recreational sail and power craft. Recreational kayak and crewing teams (e.g., dragon boat teams) also use the dockage at Pier 1.

Transient dockage is popular during New York Mets games and special events at Citi Field, as well as during the U.S. Open held at the United States Tennis Association Billie Jean King National Tennis Center in Flushing Meadows-Corona Park. The water taxi landing is utilized by New York Water Taxi, which operates ferries from Pier 11-Wall Street to Citi Field, and Seastreak, which operates cruises to some Mets games. These ferries run on game days during baseball season and during the U.S. Open (May through October).

Pier 3 contains 200 slips for dockage of seasonal and recreational boaters. Pier 3 also contains marina maintenance support facilities, machinery and equipment. A travel lift service is located on the north side of Pier 3. Secure parking is also provided upland of Pier 3, as is upland winter storage for boats.

Grand Central Parkway

The Grand Central Parkway corridor includes mapped parkland between Astoria Boulevard on the north and Union Turnpike on the south. The parkland includes grass lawn with trees, but is not publicly accessible, nor is there any seating or any other amenities.

Other Open Space in Study Area

Other open spaces in the study area include: Hinton Park, a 3.73-acre open space with playing fields, trees, and benches, that is bounded by 34th Avenue, 37th Avenue, 114th Street and 113th Street; Louis Armstrong Playground, a 1.9-acre open space located across from 113th Street, which provides play courts, playgrounds, spray showers, and restroom facilities; and Barclay Triangle, a 0.05-acre open space with benches and trees, located at the intersection of Astoria Boulevard, 31th Avenue, and 102nd Street. There is also DPR's Louis Armstrong Community Center located in the block bounded by 107th Street, 108th Street, Northern Boulevard, and 34th Avenue.

MANAGED ACCESS OPEN SPACE

According to the *CEQR Technical Manual*, open space that is not publicly accessible or is available only to limited users and not to the general public on a regular or constant basis, is not counted in the open space inventory. Therefore, the following open spaces are not included in the quantitative analysis, but are described below.

World's Fair Marina (Pier 3)

Pier 3 is not open to the public, but provides recreational seasonal dockage for private vessels with approximately 200 slips. Access to Pier 3 docks is controlled from a gangway off the waterfront promenade that is located near the marina offices. Access is limited to boat owners and their guests. Pier 3 also has a 50-ton travel lift for vessel haul-out, launch, and repair, a secured parking area, and a boat storage lot.

Citi Field

Citi Field, within Flushing Meadows-Corona Park, is the 45,000-seat home field stadium for the New York Mets Major League Baseball team. Completed in 2009, Citi Field is operated by the Mets under a lease agreement with DPR. The leased land is mostly occupied by surface parking and the baseball stadium. Citi Field is also a venue for concerts and other sporting events, and includes event space that is available for rent by private parties.

FIELD SURVEYS AND PARK USER DATA

Field surveys of the publicly accessible open spaces along the Flushing Bay waterfront (e.g., the waterfront promenade and marina) were conducted on Labor Day, September 2011 between the hours of 4pm and 6pm as well as on eight days between April and September 2012 during either the midday hours from 12pm to 2pm or the evening hours between 5pm and 7pm. The purpose of the surveys was to gather data on the open space users, park features, and utilization. The primary user groups identified during the surveys was comprised of the general public using the waterfront promenade for activities such as walking, jogging, biking, fishing, or sitting on the many benches. Overall, the use of the waterfront promenade was light with generally 5-15 people observed using the space at any one time. The parking lot was observed as used by cab drivers or the general public resting in or near their cars. There was no visually evident or substantive increase in usage either during Mets games or on Friday evenings in the summer.

With regard to the marina, the field surveys support information provided by DPR staff that there is an increase in boating activity and marina use that begins in the spring (April to June) as vessels in dry storage are launched and winterized vessels are placed into use. The marina activity is then steady through the summer months until September with peaks around the major summer holidays (Memorial Day, 4th of July, Labor Day). Most slips at Pier 3 were observed as occupied during the surveys while the Pier 1 slips appeared to be about 75 percent occupied.

QUANITATIVE ASSESSMENT OF OPEN SPACE RESOURCES

With a total of 10.53 acres of publicly accessible open space (of which 7.55 are for active use and 2.98 are for passive use) and a total residential population of 17,498, the study area has an overall open space ratio of approximately 0.60 acres per 1,000 residents. This is below DCP's planning guideline of 2.5 acres of open space per 1,000 residents and less than the median ratio at the citywide Community District level (1.5 acres of open space per 1,000 residents). The study area's current residential passive open space ratio is 0.17 acres of passive open space per 1,000 residents, which is also below DCP's goal of 0.5 acres per 1,000 residents. The area's

residential active open space ratio is 0.42 acres per 1,000 residents, which is also substantially below DCP's planning guideline of 2.0 acres per 1,000 residents. This indicates an overall open space need in the study area. In addition, the waterfront promenade provides the only waterfront access in the study area.

While the study area open space ratio is below the City's goals, it is noted that this ratio includes only 2.4 acres of the larger 1,255-acre Flushing Meadows-Corona Park. The remaining park acreage is located immediately outside and to the south of the study area. If the entire Flushing Meadows-Corona Park acreage was included, the study area would be well served by existing open space resources, but the waterfront promenade would remain the only waterfront access to Flushing Bay in the study area.

D. FUTURE WITHOUT THE PROPOSED PROJECT

PROPOSED PROJECT AREA

Under the No Action Condition, no changes to water uses are expected within the proposed project area. Conditions at Piers 2 and 3 in the World's Fair Marina are expected to remain unchanged with the exception of improvements in maritime infrastructure that DPR would undertake as part of its regular maintenance and repair operations. DPR has no plans at this time to reactivate Pier 2. The deteriorated Pier 2 is adjacent to outfall BB-006 and has not been used for several years due to long term sedimentation that eventually precluded ongoing use as an active marina.

There would also be no removal of accumulated CSO sediments and deposition of CSO sediments would continue to occur in the proposed project area. Without the removal of sediment, there would not be an opportunity to restore Pier 2.

PROJECT ADJACENT AREA

In the future without the proposed project, there are no proposed changes to land or water uses adjacent to the project area. Conditions at Pier 1 in the World's Fair Marina are expected to remain unchanged with the exception of improvements in maritime infrastructure that DPR would undertake as part of its regular maintenance and repair operations. Conditions along the waterfront promenade and World's Fair Marina Restaurant and Banquet Hall are also expected to remain unchanged.

STUDY AREA

There are no known planned capital park improvement projects for the study area open spaces through the 2018 analysis year. One No Action project immediately south of the study area is the expansion of the Arthur Ashe tennis stadium with additional courts and seating. This project is expected to be completed in 2016. No other changes to study area open spaces are expected other than routine maintenance and repair.

E. FUTURE WITH THE PROPOSED PROJECT

PROPOSED PROJECT AREA

Under the proposed project, approximately 16.8 acres of Flushing Bay would be environmentally dredged including water areas partially occupied by Piers 2 and 3 of DPR's World's Fair Marina. The proposed project is anticipated to be completed in 2018 and the total duration of construction, including mobilization, active construction (dredging), demobilization,

and completion of the wetland restoration would be less than 24 months. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. To provide access for the dredging equipment, the proposed project would require the temporary removal and replacement of approximately 1,630 linear feet of floating docks and the temporary displacement of 70 boat slips at Pier 3 during construction; however, the proposed project includes provisions to provide access to Pier 3 and its facilities for boat owners to the extent practicable. Upon completion of the proposed project, the relocated boat slips and docks would be restored to their original location (see **Figure B-8**). Boaters would not be denied access to their boats at any time during construction, because the proposed project includes provisions to provide access to Pier 3 and its facilities. The proposed project would be closely coordinated with DPR to minimize impacts to recreational activities in the marina, particularly during peak use in the summer months. In addition, a number of existing timber anchor piles at both Piers 2 and 3 would need to be removed, as they pose potential constraints to proposed project vessel navigation and other operations necessary to perform the required dredging.

The proposed project includes provisions to provide boat owners access to Pier 3 and its facilities to the greatest extent practicable. The following options are therefore proposed:

- Pier 2: Existing timber piles would be removed and disposed, except for those designated by DPR to remain in place near the head of Pier 2. No new piles would be installed at this location. Removed piles would be pulled in their entirety, rather than cut below the water surface.
- Pier 3: To provide access for a hydraulic or mechanical dredge at Pier 3, certain piles would be removed during construction and replaced with new piles at the same location. The floating docks would then be reinstalled at the same location. Based on discussions with DPR staff, it is expected that the proposed project would support the World's Fair Marina operations and would provide benefits for recreational boaters by removing accumulated sediment mounds and the associated nuisance odors, improving the aesthetic of the bay by removing deteriorated timber piles at Pier 2 and exposed sediment mounds and restoring wetlands along the shoreline.

Impacts on DPR facilities and relocation of access would therefore be temporary and short-term in duration and would not be expected to result in any significant adverse impacts to the marina or public access to or along the waterfront. Upon completion of the proposed project, the relocated docks and boat slips would be restored to existing conditions at their original locations. Therefore, the proposed project would not result in potential significant adverse impacts to open space.

ADJACENT AREA

The proposed project would include measures to avoid and minimize potential conflicts with the waterfront promenade. All dredging activities would be water-based, although some shoreline work may be require limited use of the waterfront promenade to support the water-based activities. Project work that may require limited landside access could include: (1) installation and removal of temporary construction-limit fencing or markers; (2) wetland restoration; and/or (3) relocating or installing temporary utility connections at Piers 2 and 3 (see also Section G, "Construction"). As noted in Section G, "Construction," to reduce dredging-related odors to the

greatest extent practicable, a CAMP would be implemented. The CAMP would be in place at the start of construction mobilization through demobilization and would enable the contractor to restrict or temporarily cease dredging activities on an as-needed basis. In addition, appropriate odor control measures, including neutralizing and foaming deodorizing agents, would be utilized under the CAMP. If the monitored H2S level exceeds an hourly Action Threshold identified in Section G, "Construction," the proposed project would be required to restrict dredging and/or temporarily close the waterfront promenade to pedestrians. In addition, the City's Noise Control Code would require the contractor to develop a Construction Noise Mitigation Plan prior to the start of work. This plan would include noise minimization strategies, methods, procedures and technologies for each piece of equipment or activity performed at the site during construction. Construction activities would be closely coordinated with DPR to minimize impacts to recreational activities in the marina (i.e., at Pier 1) as well as along the adjacent upland park and waterfront promenade. Therefore, the proposed project would not result in potential significant adverse impacts to adjacent open space.

The proposed project would reduce nuisance odors associated with existing sediment mounds at outfalls BB-006 and BB-008, improve the aesthetic of Flushing Bay by removing the deteriorated timber piles at Pier 2 and exposed sediment mounds, restore wetlands along the shoreline, and enhance the shoreline habitat. Therefore, the proposed project would not result in potential significant adverse impacts to open space.

STUDY AREA

The proposed project would not result in potential significant adverse indirect impacts on open spaces in the study area. ✷

A. INTRODUCTION

The *CEQR Technical Manual* indicates that a natural resource assessment should be conducted when a natural resource is present on or near a project site, and when that project has the potential to cause direct or indirect disturbances to a natural resource. The following may be considered, as appropriate, in a natural resources analysis: "ground water, soils and geologic features, numerous types of natural and human-created aquatic and terrestrial habitats (including wetlands, dunes, beaches, grasslands, woodlands, landscaped areas, gardens, parks and built structures) and any areas used by wildlife." The following provides a review of the aquatic and terrestrial habitats within the proposed project area. Potential effects to natural resources based on construction are discussed in Section G, "Construction."

B. EXISTING CONDITIONS

FLOODPLAINS

The entire proposed project area is within Flushing Bay. A review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the area adjacent to the proposed project area indicate that the proposed project area would be located within a Special Flood Hazard Area (Zone AE) that is subject to flooding by the one percent annual chance flood (100-year flood). Flooding events associated with only excessive rainfall are rare due to the existing system of stormwater conveyances and outfalls at the proposed project area. Flooding of low-lying areas adjacent to the proposed project area is more likely the result of storm surges from tropical storms or "nor'easters" that can surcharge catchment systems.

WATER QUALITY

Flushing Bay is a tidally-influenced bay that encompasses all waters south of the confluence of the East River to the mouth of Flushing Creek (DEP 2011). The Bay experiences a semi-diurnal tidal cycle with a typical vertical tidal range of approximately 6.8 feet. The proposed project area is located within the southern (inner) portion of the bay adjacent to the World's Fair Marina which is discussed in more detail in Section A, "Project Description." As previously discussed, there are three CSO outfalls at or in close proximity to the proposed project area along the southern shoreline of the bay that have contributed to existing sediment and water quality impacts within the bay. CSO outfalls BB-006 and BB-008 are located within the limits of the proposed project area and outfall BB-007 is located west of the proposed project area, within the southwestern corner of the bay. A total of ten stormwater outfalls are located within the footprint of the proposed restoration area.

Flushing Bay is classified by NYSDEC as a Class I waterbody, which has water quality standards established to maintain uses such as fishing or boating (NYSDEC Part 935.6). NYSDEC's best usage criteria for Class I waterbodies is that the waters shall be suitable for fish propagation and survival and secondary contact recreation (NYSDEC Part 701.13). DEP's Harbor Survey Program maintains several water quality data stations within Flushing Bay.

Station E15 is located nearest to the proposed project area and is located near the tidal breakwater, where the inner and outer bays meet, northeast of the proposed dredge area. Based on a summary of data from the Harbor Survey's 2011 sampling events from January to December, average salinity levels for surface and bottom waters were 21.68 and 22.25 practical salinity units (psu), respectively. Average water temperatures in this section of Flushing Bay were 18.91 degrees Celsius (°C) for surface waters and 18.41°C for bottom waters.

Based on 2011 data for station E15, the seasonal geometric mean fecal coliform level was 254/100 mL for surface water samples, with values ranging from 1 to 4,000/100 mL. A minimum of one sample per month was taken during 2011, with multiple samples taken during the warmer months of June through September.

Dissolved oxygen (DO) levels for surface and bottom waters averaged 6.37 and 5.88 milligrams per liter (mg/L), respectively. 2011 represents an atypical year. During 2011, DO levels routinely remained above the water quality standard of 4.0 mg/L required for the bay to meet Class I standards. Hypoxic conditions (less than 3.0 mg/L for DO) were detected twice at bottom depths during a June and September 2011 sampling event. Average monthly dissolved organic carbon (DOC) values within Flushing Bay were also available from the DEP Harbor Survey Program for the period from 2006 to 2011. DOC can be used as a surrogate measure for biological oxygen demand (BOD). In general, DOC values are highest in early winter (December) and lower in the spring (April) in Flushing Bay. This would correspond to ultimate BOD levels between 7.8 to 10.8 mg/L, which is indicative of poor, somewhat polluted water quality. This conclusion was also supported by additional water quality sampling conducted in support of the proposed project as part of separate assessments of existing aquatic habitat and sediment quality completed within the proposed project area in 2011 and 2012. This indicates compromised water quality within and adjacent to the proposed project area (DEP 2012a).

SEDIMENT QUALITY

To characterize the existing sediment quality of the proposed project area, sediment sampling was completed within the proposed dredge area during May 2012. Samples were collected from 20 locations and analytical results were acquired for 19 of these stations. At each station, samples were collected from the proposed project dredge depth and also from the sediments that could be exposed after dredging was completed. Sediment samples at each station were obtained at elevations ranging between approximately 5.5 and 6.5 feet below Mean Lower Low Water (MLLW). Samples were analyzed for grain size, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, inorganic constituents (metals) and total organic carbon (TOC) in accordance with the requirements of NYSDEC Technical and Operational Guidance Series (TOGS) 5.1.9 - In-Water and Riparian Management of Sediment and Dredged Material. In addition, additional deeper sediment sampling was conducted within the footprint of Pier 3 at four locations to determine if the removal of additional sediments would result in the exposure of less contaminated material. These deeper samples were acquired within a range of depths from 6.5 to 8.5 feet below MLLW.

Results of the analytical data were compared to NYSDEC TOGS 5.1.9 criteria, which are used to characterize potential sediment contamination and determine if special management measures may be required if high contamination levels are identified within the proposed project depth and/or the sediments exposed after dredging. Among the objectives of TOGS 5.1.9 is the identification of sediment quality thresholds for selecting best management practices for dredging and in-water (riparian) placement of dredged materials (if applicable). According to TOGS 5.1.9, based upon the results of laboratory analyses, sediments should be classified as

either A, B, or C for purposes of assessing appropriate management and placement strategies. Class A is identified as sediments that have no appreciable contamination and would not be toxic to aquatic life. If sediment chemistry is found to be at or below the chemical concentrations that define this class, then dredging and in-water or riparian placement can generally proceed at approved locations. Class B materials are identified as those which have moderate contamination and may exhibit chronic toxicity to aquatic life. Dredging and riparian placement may be conducted with several restrictions. Class C is identified as materials that have high levels of contamination and are expected to be potentially acutely toxic to aquatic life. Dredging and disposal requirements for this latter class of material may, therefore, be more stringent.

Results of the sediment sampling are presented within Tables F-1 and F-2 in Section F, "Hazardous Materials." These tables list the contaminants for which NYSDEC has developed sediment contamination thresholds (classifications) and the concentrations at which the thresholds apply. The results of the laboratory analyses indicated that dominant sediment classifications within the proposed project dredge depth and post-dredge sediments were the same for the individual parameters evaluated (e.g., Class A for benzene in the proposed project dredge depth and for the newly exposed sediments). Tables F-3 and F-4 within Section F, "Hazardous Materials," present a summary of all sampling results for the proposed project depth and newly exposed sediments respectively, the threshold values for the three sediment classifications and the classifications based upon individual results.

For metals, arsenic and cadmium were noted as Class B or better within both sediment horizons; while copper, lead and mercury were generally Class C with few exceptions. Sediment PCB concentrations were predominantly Class A or B in both the proposed project depth and post-dredge sediments. Pesticide analyses showed sediments with a designation of Class A for dieldrin and DDT and Class B for chlordane and mirex within the proposed dredged material and remaining sediments. The remaining parameters consisting of total PAHs, benzene and BTEX (benzene, toluene, ethylbenzene and xylene) were almost exclusively Class A. Based on the analytical results, the sediments to be dredged and the sediments to be exposed after dredging can generally be conservatively classified as Class C, based upon those parameters discussed above that exceeded Class C thresholds.

Grain size data analyses indicated that the majority of the sediment within the proposed dredge area is classified as fine sand, with individual samples ranging from 29 percent to 64.8 percent. The second most prominent grain size was medium sand, followed by clay and silt. Total sand fractions ranged from 76 percent to 97 percent within the inner bay with the highest fraction recorded near outfall BB-006. The highest percentages of clay and silt were reported in the vicinity of outfall BB-008. High percentages of clay were also found at sampling locations near the shoreline along the southern side of the World's Fair Marina. Small amounts of coarse sand and fine gravel were detected in several samples with no coarse gravel or cobbles identified. Field observations taken during the sediment sampling indicated that the sediments were dark in color and appeared to have a "gritty" texture within a fine silt matrix.

WETLANDS

The proposed project would occur within the inner bay southwest of the breakwater along portions of the southern shoreline of the bay. In this area, the entire length of the shoreline is stabilized by a riprap-armored embankment. Based on review of NYSDEC and U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, Flushing Bay is located within tidal wetlands (**Figure B-24**). The inner bay is mapped by NYSDEC as littoral zone, which is defined as tidal wetlands that include all lands under tidal waters six feet or less at mean

low water (MLW). The NWI maps classify the bay as "estuarine, subtidal, unconsolidated bottom with a subtidal water regime (E1UBL)." Portions of the dredge area are exposed at low tide and water depths in the proposed project area range from zero to three feet MLLW. A site visit was conducted at the proposed project area during fall 2011 to assess the location and type of any additional wetlands. The site visit indicated that additional wetlands consisting of intertidal vegetated wetlands exist within the limits of the proposed project area and are localized along the shoreline. A wetland delineation was completed in December 2011 and identified intertidal saltmarsh, comprised of saltmarsh cordgrass in or adjacent to the proposed project area (**Figure B-25**). Expanses of salt marsh cordgrass are also present in the interstices of the riprap-armored embankment along the shoreline; many of these vegetated areas are also associated with colonies of ribbed mussels. These wetland areas are located south of Pier 3 and the remnants of Pier 2 within the World's Fair Marina and are located along the shoreline, adjacent to the proposed project area. An additional area of historic fill is located within the former footprint of Pier 2. This area is characterized as shallow, has been filled largely as a result of historic discharges, and was historically classified as littoral zone wetlands.

BIOTA

BENTHIC COMMUNITY

Benthic invertebrates are relatively sedentary, and therefore must be tolerant of the habitat conditions to survive (e.g., water and sediment quality). A baseline assessment of the subtidal benthic community within the proposed project area was completed during June 2012, in addition to a review of previous benthos sampling in the study area. Benthic samples from 32 stations were collected according to a NYSDEC-approved sampling plan (April 3, 2012), in order to determine the existing benthic invertebrate community composition, species richness and diversity (indicators of habitat quality). Two habitat strata were identified within the proposed project area: an intertidal zone defined as one to two feet above MLLW and a shallow subtidal zone defined as one to seven feet below MLLW. Reference sample locations were also taken outside the assumed area of CSO influence to serve as comparisons to those habitat strata located in the proposed project area (**Figure B-26**).

A total of 21,099 benthic organisms from 14 distinct taxa were collected at the eight intertidal benthic (IB) stations and a total of 14,770 organisms from 25 distinct taxa were collected at the eight intertidal reference (IR) stations (**Table E-1a**). Taxa richness was significantly lower ($p < 0.05$) at the IB stations compared to the IR stations. The majority of the organisms collected at the IB stations were the amphipod *Corophium insidiosum* (32% of the total IB collection), the blood red worm *Capitella capitata* (29%), annelid worms (Oligochaeta) (15%), and the segmented worm *Streblospio benedicti* (12%). By comparison, the majority of the organisms collected at the IR stations were the amphipod *Ampelisca abdita* (45% of the total IR collection) and a variety of annelid species (49% of the total IR collection).

A total of 3,643 benthic organisms from 17 distinct taxa were collected at the eight shallow subtidal benthic (SSB) stations and a total of 11,892 organisms from the slightly higher 18 distinct taxa were collected at the eight shallow subtidal reference (SSR) stations (**Table E-1b**). The majority of the organisms collected at the SSB stations were the blood red worm (64% of the total SSB collection) compared to the collections at the SSR stations, which were dominated by roundworms (*Nematoda*) at 30% of the total SSR collection, followed by the polychaete *Scoloplos robustus* (20%), and the amphipod *Ampelisca abdita* (15%).

The benthic community within Flushing Bay was assessed through calculations of density, taxa richness, Shannon-Wiener's diversity index, and Pielou's evenness index. These are standardized data reduction and presentation models that provide a defensible and NYSDEC and USACE -accepted means of presenting benthic data. A standard *t*-test was used to determine if a statistically significant difference existed between the samples collected within the proposed project area (both intertidal and shallow subtidal) compared to their corresponding reference areas (outside the proposed project area). **Table E-2** presents the results of the benthic invertebrate community indices including taxa richness, density (organisms/m2), diversity (*H*'), evenness (*J*'), and the proportion of pollution tolerant and pollution sensitive taxa at each sampling location. **Table E-3** presents the means and *t*-test results for each of the community indices.

The proportion of benthic organisms characterized as pollution tolerant (i.e., indicators of potentially degraded habitat conditions) and pollution sensitive (indicators of quality habitat) were also calculated for each sample based on Adams, 1998, Llansó *et al.*, 2002, and Weis,1995 (DEP 2012b). The percentage of pollution tolerant species is one parameter that describes the overall habitat quality and health of a benthic community. Typically, pollution tolerant species are opportunistic and are most commonly found in heavily disturbed areas. Pollution tolerant taxa include: Oligochaeta, *Leitoscoloplos* sp., Capitellidae, *Streblospio benedicti*, and *Mulinia lateralis*. Pollution sensitive taxa include: *Diopatra cuprea, Spiophanes bombyx, Cyathura polita, Acteocina canaliculata, Ensis directus, Mercenaria mercenaria, Spisula solidissima,* and *Tellina agilis*. The proportion of pollution tolerant taxa was higher in both the intertidal dredging area (63.7%) and the shallow subtidal dredging area (77.9%) in comparison to the corresponding reference areas (49.4% and 58.1%, respectively) (**Table E-2**).

Table E-1a

Total Number of Benthic Macroinvertebrates Collected at Intertidal Benthic and Intertidal Reference Stations in Flushing Bay, NY, June 2012

						Station Type	Benthic Stations									Reference Stations								
						Station	IB-1	IB-2	IB-3	IB-4	IB-5	IB-6	IB-7	IB-8	Total	IR-1	IR-2	IR-3	IR-4	IR-5	IR-6	IR-7	IR-8	Total
Phylum	Class	Order	Family	Genus	Species	Split Fraction	1/18	1	1/36	1/72	1/9	1/36	7/36	1/36		1/18	1/9	1/12	1/72	1/9	1/18	1/6	5/36	
Annelida	Oligochaeta	---	---	---	---		990	1		1,224	612	72	108	180	3,187		36	492	360	63	90	120	137	1,298
	Polychaeta	Aciculata	Hesionidae	*Microphthalmus*	*aberrans*										0		54	24				6		84
		Ariciida	Orbiniidae	*Scoloplos*	*robustus*					72		36		288	396	72	81	120	360	162	252	240	144	1,431
		Capitellida	Capitellidae	*Capitella*	*capitata*		108	7	1,368	864	36	792	262	2,772	6,209	558	117	120		36		6		837
				Notomastus	---										0			24						24
		Cirratulida	Cirratulidae	*Tharyx*	---										0			12	144	36	108	24	22	346
		Phyllodocida	Glyceridae	*Glycera*	*americana*										0			12		9	18		14	53
			Nereidae	*Nereis*	---						9				9			12						12
				Nereis	*succinea*				36			108			144	18	9		72	9			29	137
			Phyllodocidae	*Eteone*	---							36			36									0
				Eteone	*heteropoda*										0	18	18		72	9		6	22	145
		Spionida	Spionidae	*Marenzelleria*	*viridis*		54				9				63									0
				Polydora	*cornuta*		72		36	360	27	468			963	216	54	24	504	36	162	60	65	1,121
				Streblospio	*benedicti*				1,080	1,008		360			2,448	738	423		576	36				1,773
Arthropoda	Crustacea	Amphipoda	Ampeliscidae	*Ampelisca*	---										0	54								54
				Ampelisca	*abdita*										0		54	312	4,392	441	1,152	72	238	6,661
			Aoridae	---	---		54				108	72			234	54		24	432	18		6		534
			Corophiidae	*Corophium*	*insidiosum*		432		900	3,672	126	1,548			6,678									0
			Gammaridae	*Gammarus*	*mucronatus*		54			216	9				279									0
			Melitidae	*Melita*	*nitida*										0				72					72
		Cumacea	Leuconidae	*Leucon*	*americanus*										0		9						7	16
		Decapoda	Crangonidae	*Crangon*	*septemspinosa*										0							6		6
			Xanthidae	*Rhithropanopeus*	*harrisii*										0						18			18
		Isopoda	Idoteidae	*Edotea*	*triloba*										0								7	7
Mollusca	Bivalvia	Myoida	Myidae	*Mya*	*arenaria*				36						36									0
		Veneroida	Astartidae	*Astarte*	---										0							24		24
			Mactridae	*Mulinia*	*lateralis*										0			12						12
			Tellinidae	*Tellina*	---										0								7	7
	Gastropoda	Neogastropoda	Nassariidae	*Ilyanassa*	*obsoleta*										0				72					72
Nematoda	---	---	---	---	---			5					123	288	416		27							27
Total Benthic Organisms							**1,764**	**13**	**3,456**	**7,416**	**936**	**3,492**	**494**	**3,528**	**21,099**	**1,728**	**882**	**1,188**	**7,056**	**855**	**1,800**	**570**	**691**	**14,770**

Table E-1b

Total Number of Benthic Macroinvertebrates Collected at Shallow Subtidal Benthic and Shallow Subtidal Reference Stations in Flushing Bay, NY, June 2012

						Station Type	Benthic Stations									Reference Stations								
						Station	SSB-1	SSB-2	SSB-3	SSB-4	SSB-5	SSB-6	SSB-7	SSB-8	Total	SSR-1	SSR-2	SSR-3	SSR-4	SSR-5	SSR-6	SSR-7	SSR-8	Total
Phylum	Class	Order	Family	Genus	Species	Split Fraction	1	7/18	1	1	1/9	11/72	1/8	1/9		1/36	1/4	1/18	1/9	1/18	1/18	5/36	5/36	
Annelida	Oligochaeta	---	---	---	---			126				65			191		76	18	378	558	126	144	187	1,487
	Polychaeta	Aciculata	Hesionidae	*Microphthalmus*	*aberrans*									63	63		12	126	108	36	36	22		340
		Ariciida	Orbiniidae	*Scoloplos*	---			3	3						6									0
				Scoloplos	*robustus*		1				450		8	99	558	180	116	126	162	1,008	198	274	281	2,344
		Capitellida	Capitellidae	*Capitella*	*capitata*		2	72	87	1	171	511	760	711	2,315	540	116	882	36	18				1,592
		Cirratulida	Cirratulidae	*Tharyx*	---										0								14	14
		Phyllodocida	Glyceridae	*Glycera*	*americana*										0		4							4
			Nereidae	*Nereis*	*succinea*						36				36									0
			Phyllodocidae	*Eteone*	*heteropoda*						18				18	36	8		27	36			14	121
		Spionida	Spionidae	*Polydora*	*cornuta*					1	63				64	144	4	36	45		18			247
				Streblospio	*benedicti*				1						1		8	90		18				116
Arthropoda	Arachnida	Oribatida	Oribatidae	---	---			5							5									0
	Crustacea	Amphipoda	Ampeliscidae	*Ampelisca*	---				1						1			18	81					99
				Ampelisca	*abdita*						207			9	216					54	1,386	238	151	1,829
			Aoridae	---	---						45				45									0
			Corophiidae	*Corophium*	*insidiosum*					1	18				19									0
		Cumacea	Leuconidae	*Leucon*	*americanus*										0			18				7	14	40
		Decapoda	Crangonidae	*Crangon*	*septemspinosa*										0		4			18				22
	Insecta	Diptera	Phoridae	---	---			3							3									0
			Psychodidae	*Pericoma/Telmatoscopus*	---			46		1		46		9	102									0
Mollusca	Bivalvia	---	---	---	---										0				18					18
		Veneroida	Mactridae	*Mulinia*	*lateralis*										0						18	7	7	32
			Solenidae	*Ensis*	*directus*										0				9					9
			Tellinidae	*Macoma*	*tenta*										0		4							4
				Tellina	---										0			18					7	25
Nematoda	---	---	---	---	---		1								1	2,880	40	612	9			7		3,548
Total Benthic Organisms							**4**	**255**	**92**	**4**	**1,008**	**622**	**768**	**891**	**3,643**	**3,780**	**392**	**1,944**	**873**	**1,746**	**1,782**	**698**	**677**	**11,892**

Table E-2

Taxa Richness, Benthic Organism Density, Diversity, Evenness, and Percentage of Pollution Tolerant and Sensitive Taxa by Station and Habitat Area for Benthic Samples Collected in Flushing Bay, NY, June 2012

Habitat Area	Station	Taxa Richness	Density (# of Organisms/m^2)	Diversity (*H'*)	Evenness (*J'*)	Percentage of Pollution Tolerant Taxa	Percentage of Pollution Sensitive Taxa
Intertidal Dredging Area	IB-1	7	44,100	1.29	0.66	62.2%	0.0%
	IB-2	3	325	0.90	0.82	61.5%	0.0%
	IB-3	6	86,400	1.22	0.68	70.8%	0.0%
	IB-4	7	185,400	1.46	0.75	42.7%	0.0%
	IB-5	8	23,400	1.16	0.56	69.2%	0.0%
	IB-6	9	87,300	1.56	0.71	36.1%	0.0%
	IB-7	3	12,343	1.02	0.92	75.0%	0.0%
	IB-8	4	88,200	0.75	0.54	91.8%	0.0%
	Average	**6**	**65,933**	**1.17**	**0.71**	**63.7%**	**0.0%**
Intertidal Reference	IR-1	8	43,200	1.43	0.69	79.2%	0.0%
	IR-2	11	22,050	1.76	0.74	74.5%	0.0%
	IR-3	12	29,700	1.68	0.68	64.6%	0.0%
	IR-4	11	176,400	1.43	0.60	18.4%	0.0%
	IR-5	11	21,375	1.61	0.67	34.7%	0.0%
	IR-6	7	45,000	1.19	0.61	19.0%	0.0%
	IR-7	11	14,250	1.70	0.71	64.2%	0.0%
	IR-8	11	17,280	1.81	0.75	40.6%	0.0%
	Average	**10**	**46,157**	**1.58**	**0.68**	**49.4%**	**0.0%**
Shallow Subtidal Dredging Area	SSB-1	3	100	1.04	0.95	75.0%	0.0%
	SSB-2	6	6,364	1.19	0.66	78.8%	0.0%
	SSB-3	4	2,300	0.26	0.19	98.9%	0.0%
	SSB-4	4	100	1.39	1.00	25.0%	0.0%
	SSB-5	8	25,200	1.56	0.75	61.6%	0.0%
	SSB-6	3	15,545	0.59	0.54	92.6%	0.0%
	SSB-7	2	19,200	0.06	0.08	100.0%	0.0%
	SSB-8	5	22,275	0.70	0.44	90.9%	0.0%
	Average	**4**	**11,386**	**0.85**	**0.58**	**77.9%**	**0.0%**
Shallow Subtidal Reference	SSR-1	5	94,500	0.80	0.50	19.0%	0.0%
	SSR-2	11	9,800	1.72	0.72	80.6%	0.0%
	SSR-3	10	48,600	1.47	0.64	57.4%	0.0%
	SSR-4	9	21,825	1.72	0.78	66.0%	1.0%
	SSR-5	8	43,650	1.09	0.52	91.8%	0.0%
	SSR-6	6	44,550	0.80	0.45	19.2%	0.0%
	SSR-7	7	17,460	1.31	0.67	60.8%	0.0%
	SSR-8	8	16,920	1.40	0.67	70.2%	0.0%
	Average	**8**	**37,163**	**1.29**	**0.62**	**58.1%**	**0.1%**

Sampling of both intertidal and shallow subtidal habitats showed that within the inner bay itself, benthic habitat conditions may vary significantly with more degraded habitats existing within the areas to be dredged in comparison to corresponding reference areas just beyond the immediate proposed project area. This conclusion was based on that significantly more, and a greater diversity of, taxa were found in the intertidal and shallow subtidal reference areas than in the intertidal and subtidal dredging areas (**Table E-3**). Water quality data collected during the 2012 benthic sampling also found that average DO at the intertidal and shallow subtidal benthic stations within the proposed project area was consistently lower than the corresponding reference locations (outside the proposed project area).

Table E-3

Means and t-test Results for Diversity (H'), Evenness (J'), and Percentage of Pollution Tolerant and Pollution Sensitive Taxa, Benthic Samples, Flushing Bay, NY, June 2012

	Dredging Area	Reference Area	*T*	*df*	*p*	Significant at $p < 0.05$
	Intertidal Habitat					
Taxa Richness	6	10	-3.45	14	0.005	Yes
Density (#/m^2)	65,933	46,157	1.71	14	0.065	No
Diversity (*H'*)	1.17	1.58	-2.41	14	0.023	Yes
Evenness (*J'*)	0.71	0.68	0.52	14	0.310	No
% Pollution Tolerant Taxa	63.7%	49.4%	1.76	14	0.061	No
% Pollution Sensitive Taxa	0.0%	0.0%	N/A	14	N/A	N/A
	Shallow Subtidal Habitat					
Taxa Richness	4	8	-5.14	14	0.001	Yes
Density (#/m^2)	11,386	37,163	-2.24	14	0.030	Yes
Diversity (*H'*)	0.85	1.29	-2.01	14	0.042	Yes
Evenness (*J'*)	0.58	0.62	-0.34	14	0.373	No
% Pollution Tolerant Taxa	77.9%	58.1%	1.37	14	0.107	No
% Pollution Sensitive Taxa	0.0%	0.1%	-1	14	0.175	No

FISH AND ICHTHYOPLANKTON

Fish and aquatic life use of Flushing Bay is impaired due to development in the watershed, which has permanently modified virtually all factors that can have a major influence on the ecological health of an estuarine waterbody (DEP 2011). Broadly defined, Flushing Bay would be expected to share a similar fish and aquatic community structure and composition as the larger East River tributary complex. However, a careful examination of both historic and recent benthic and biological habitat characterization studies indicate that fish and aquatic life habitats within the inner bay and proposed project area remain highly impaired, even in comparison to other areas of the bay.

Flushing Bay is designated as Essential Fish Habitat (EFH) by NOAA Fisheries for 17 managed species. To assess potential impacts to fisheries, an EFH assessment was completed and is included as **Attachment D**. The EFH concluded that 8 of the 17 managed fish species (winter flounder (*Pseudopleuronectes americanus*), scup (*Stenotomus chrysops*), black sea bass

(*Centropristus striata*), red hake (*Urophycis chuss*), Atlantic butterfish (*Peprilus triacanthus*), bluefish (*Pomatomus saltatrix*), windowpane flounder (*Scophthalmus aquosus*), and summer flounder (*Paralichthys dentatus*)) could potentially be located in the proposed project area. As part of this assessment, federally-designated species of concern and threatened and endangered species and forage species in the vicinity of the proposed project area were also evaluated. The EFH provides a detailed evaluation of the potential effects of the proposed action on these species.

A limited number of quantitative fisheries studies have been conducted within Flushing Bay. As cited by Northern Ecological Associates (NEA 2002), Lawler, Matusky and Skelly Engineers conducted a trawl survey in the area of Flushing Bay during the 1980s on behalf of DEP. In addition, a finfish survey was conducted by HydroQual, Inc. that included gill nets and trawls, as well as ichthyoplankton tows that occurred at various times throughout 2001 and 2002 (HydroQual 2001-2002). Fish species present at the time of the survey completed in the 1980s were winter flounder northern sea robin (*Prionotus carolinus*), weakfish (*Cynoscion regalis*), Atlantic tomcod (*Microgadus tomcod*), Atlantic butterfish windowpane flounder and bluefish (NEA 2002). The study concluded that fisheries resources within Flushing Bay were limited and that species diversity and abundance varied with seasonal changes and pollutant loads (NEA 2002).

As part of the HydroQual surveys, finfish sampling was conducted during August through October 2001, as well as in July, September and October 2002. The sampling areas were concentrated at the mouth of Flushing Bay and the inner Bay region. The unpublished survey resulted in the collection of 13 finfish species and 3 crab species at the station closest to the proposed project area. The primary fish collected were weakfish (41% of the total catch), winter flounder (36%), Atlantic menhaden (*Brevoortia tyrannus*) (9%) and striped bass (*Morone saxatilis*) (8%). In addition, crabs including blue crab (*Callinectes sapidus*), Atlantic rock crab (*Cancer irroratus*) and green crab (*Carcinus maenas*) were also collected.

Ichthyoplankton sampling was also conducted during June and September through December 2001, as well as in February 2002. Species identified in Flushing Bay during this survey were Atlantic menhaden (76% of the total catch), Clupeidae (herring) species (12%) tautog (*Tautoga onitis*) (7%), cunner (*Tautogolabrus adspersus*) (2%), unidentified species (2%) and winter flounder (0.4%) of the total collected. Most of the larvae (91%) were later life stage larvae (post-yolk-sac) compared to yolk-sac larvae (9%).

TERRESTRIAL RESOURCES

VEGETATION

An assessment of flora and fauna adjacent to the proposed project area and its adjacent upland, up to and including the promenade was conducted The terrestrial habitat adjacent to the proposed project area consists of a shoreline that is stabilized by a riprap-armored embankment and the promenade (**Figure B-27**), which extends southward from LaGuardia Airport to the west and Harper Street to east near the mouth of Flushing Creek. Approximately 2,250 feet of the waterfront promenade follows the top of the shoreline embankment adjacent to the proposed project area. Maintained lawn areas and tree plantings separate the promenade from adjacent paved parking areas (see description of waterfront promenade in Section A, "Project Description").

A tree inventory was performed in May 2012 for those areas within the adjacent park and along the waterfront promenade that are in close proximity to the proposed project area. The extent of

the tree survey was focused on those areas where construction work may be required and generally included the waterfront and promenade area from approximately 500 feet northeast of outfall BB-008 to 500 feet southeast of outfall BB-006. The tree survey assessed the number, location and diversity of trees that could potentially be affected by the proposed project. Any tree with at least one trunk with a diameter at breast height (dbh) of four inches or more was identified to the lowest possible taxa. The tree survey identified 167 trees located within the survey area (see **Figure B-27** and **Table E-4**), including 16 trees in the shoreline area and 151 trees along the promenade.

The shoreline area encompassed the area immediately adjacent to the bay and seaward of the waterfront promenade. These trees were dominated by invasive species consisting of tree-of-heaven (*Ailanthus altissima*) and red mulberry (*Morus rubra*). Other trees identified in this area consisted of cottonwood (*Populus deltoides*), a single red maple (*Acer rubrum*), a single black locust (*Robinia pseudoacacia*) and a single Chinese elm (*Ulmus parvifolia*). Dominant saplings, shrubs, vines, and herbaceous plants seaward of the promenade consisted of cottonwood, tree-of-heaven, false indigo (*Amorpha fruticosa*), multiflora rose (*Rosa multiflora*), poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), and mugwort (*Artemisia vulgaris*). Planted trees along the promenade consisted of various oaks (*Quercus sp*.), American basswood (*Tilia americana*), honey locust (*Gleditsia triacanthos*), sweet gum (*Liquidambar styraciflua*), white pine (*Pinus strobus*) and red mulberry. The dominant trees were black oak (*Quercus velutina*) and American linden.

As per the *CEQR Technical Manual*, the Natural Heritage Program's "Ecological Communities of New York State" by Edinger et al. (2002), was used for characterizing the habitat within the study area. The terrestrial communities within the proposed project area can generally be categorized as "riprap/artificial lake shore," "paved road/path" and "mowed lawn with trees," inclusive of the shoreline area, the promenade and its adjacent area, respectively.

Table E-4
Tree Species Located Adjacent to the Proposed Project Area

Code	Circumference (inches)	DBH (inches)	Common Name	Latin Name	Health
Trees Located Along the Promenade					
P1	17	5.41	Black Oak	*Quercus velutina*	Good
P2	16	5.1	Black Oak	*Quercus velutina*	Good
P3	16	5.1	Black Oak	*Quercus velutina*	Good
P4	16	5.1	Black Oak	*Quercus velutina*	Poor
P5	14	4.46	Black Oak	*Quercus velutina*	Fair
P6	16	5.1	Black Oak	*Quercus velutina*	Poor
P7	18	5.73	Black Oak	*Quercus velutina*	Fair
P8	16	5.1	Black Oak	*Quercus velutina*	Fair
P9	18	5.73	Black Oak	*Quercus velutina*	Fair/Poor
P10	17	5.41	Black Oak	*Quercus velutina*	Fair/Poor
P11	17	5.41	Black Oak	*Quercus velutina*	Fair/Poor
P12	17	5.41	Black Oak	*Quercus velutina*	Good/Fair
P13	18	5.73	Black Oak	*Quercus velutina*	Good
P14	18	5.73	Black Oak	*Quercus velutina*	Good
P15	16	5.1	Black Oak	*Quercus velutina*	Good/Fair
P16	15	4.78	Black Oak	*Quercus velutina*	Good/Fair
P17	13	4.14	Red Oak	*Quercus rubra*	Very Poor
P18	18	5.73	Black Oak	*Quercus velutina*	Fair
P19	17	5.41	Black Oak	*Quercus velutina*	Good/Fair
P20	13	4.14	Black Oak	*Quercus velutina*	Very Poor
P21	13	4.14	Black Oak	*Quercus velutina*	Fair/Poor
P22	19	6.01	Black Oak	*Quercus velutina*	Good/Fair
P23	21	6.69	Black Oak	*Quercus velutina*	Good/Fair
P24	21	6.69	Red Oak	*Quercus rubra*	Fair
P25	16	5.1	Black Oak	*Quercus velutina*	Fair/Poor
P26	22	7	Black Oak	*Quercus velutina*	Fair/Poor
P27	13	4.14	Red Oak	*Quercus rubra*	Very Poor
P28	14	4.46	Red Oak	*Quercus rubra*	Good
P29	22	7	Red Oak	*Quercus rubra*	Good
P30	17	5.41	Black Oak	*Quercus velutina*	Good/Fair
P31	19	6.05	Black Oak	*Quercus velutina*	Good/Fair

Table E-4 (cont'd)
Tree Species Located Adjacent to the Proposed Project Area

Code	Circumference (inches)	DBH (inches)	Common Name	Latin Name	Health
Trees Located Along the Promenade					
P32	26	8.28	Black Oak	*Quercus velutina*	Good
P33	23	7.32	Black Oak	*Quercus velutina*	Good
P34	14	4.46	Scarlet Oak	*Quercus coccinea*	Fair
P35	21	6.69	Black Oak	*Quercus velutina*	Fair
P36	21	6.69	Black Oak	*Quercus velutina*	Good
P37	13	4.14	Red Oak	*Quercus rubra*	Fair
P38	20	6.37	Black Oak	*Quercus velutina*	Good
P39	15	4.77	Ornamental Unknown	*unknown*	Good
P40	17	5.41	Black Oak	*Quercus velutina*	Fair/Poor
P41	16	5.1	Black Oak	*Quercus velutina*	Poor
P42	16	5.1	Black Oak	*Quercus velutina*	Poor
P43	16	5.1	Black Oak	*Quercus velutina*	Good
P44	18	5.73	Black Oak	*Quercus velutina*	Good
P45	21	6.69	Black Oak	*Quercus velutina*	Good
P46	14	4.46	Scarlet Oak	*Quercus coccinea*	Good
P47	18	5.73	Red Oak	*Quercus rubra*	Good
P48	17	5.41	Black Oak	*Quercus velutina*	Fair/Poor
P49	21	6.69	Black Oak	*Quercus velutina*	Fair
P50	21	6.69	Scarlet Oak	*Quercus coccinea*	Good
P51	28	8.92	Black Oak	*Quercus velutina*	Good/Fair
P52	14	4.46	Black Oak	*Quercus velutina*	Good
P53	25	7.96	Black Oak	*Quercus velutina*	Fair
P54	24	7.64	Black Oak	*Quercus velutina*	Fair
P55	26	8.28	Black Oak	*Quercus velutina*	Fair
P56	23	7.32	Red Oak	*Quercus rubra*	Good/Fair
P57	25	7.96	Black Oak	*Quercus velutina*	Fair/Poor
P58	25	7.96	Black Oak	*Quercus velutina*	Fair/Poor
P59	28	8.92	Black Oak	*Quercus velutina*	Fair
P60	18	5.73	Ornamental Unknown	*unknown*	Good
P61	16	5.1	Ornamental Unknown	*unknown*	Good
P62	18	5.73	Ornamental Unknown	*unknown*	Fair
P63	19	6.05	Ornamental Unknown	*unknown*	Fair
P64	18	5.73	Ornamental Unknown	*unknown*	Fair
P65	18	5.73	Ornamental Unknown	*unknown*	Fair
P66	25	7.96	Ornamental Unknown	*unknown*	Good
P67	23	7.32	Ornamental Unknown	*unknown*	Good
P68	21	6.69	Ornamental Unknown	*unknown*	Good
P69	18	5.73	Ornamental Unknown	*unknown*	Fair
P70	18	5.73	Ornamental Unknown	*unknown*	Fair
P71	13	4.14	Ornamental Unknown	*unknown*	Fair
P72	26	8.28	Black Oak	*Quercus velutina*	Fair
P73	24	7.64	Black Oak	*Quercus velutina*	Fair
P74	29	9.24	Red Oak	*Quercus rubra*	Fair
P75	25	7.96	Red Oak	*Quercus rubra*	Fair
P76	31	9.87	Black Oak	*Quercus velutina*	Good
P77	24	7.64	Red Oak	*Quercus rubra*	Good
P78	15	4.77	Red Oak	*Quercus rubra*	Good
Trees Located Along the Promenade					
P79	24	7.64	American Linden	*Tilia americana*	Good

Table E-4 (cont'd)
Tree Species Located Adjacent to the Proposed Project Area

Code	Circumference (inches)	DBH (inches)	Common Name	Latin Name	Health
P80	16	5.1	American Linden	*Tilia americana*	Good
P81	19	6.05	American Linden	*Tilia americana*	Good
P82	28	8.91	American Linden	*Tilia americana*	Good
P83	27	8.6	American Linden	*Tilia americana*	Good
P84	22	7	American Linden	*Tilia americana*	Good
P85	25	7.96	American Linden	*Tilia americana*	Good
P86	25	7.96	American Linden	*Tilia americana*	Good
P87	22	7	American Linden	*Tilia americana*	Good
P88	26	8.28	American Linden	*Tilia americana*	Good
P89	26	8.28	American Linden	*Tilia americana*	Good
P90	24	7.64	American Linden	*Tilia americana*	Good
P91	24	7.64	American Linden	*Tilia americana*	Good
P92	22	7	American Linden	*Tilia americana*	Good
P93	23	7.32	American Linden	*Tilia americana*	Good
P94	23	7.32	American Linden	*Tilia americana*	Good
P95	19	6.05	American Linden	*Tilia americana*	Good
P96	24	7.64	American Linden	*Tilia americana*	Good
P97	24	7.64	American Linden	*Tilia americana*	Good
P98	23	7.32	American Linden	*Tilia americana*	Good
P99	23	7.32	American Linden	*Tilia americana*	Good
P100	23	7.32	Sweetgum	*Liquidambar styraciflua*	Good
P101	17	5.41	Sweetgum	*Liquidambar styraciflua*	Good
P102	19-25	6.05-7.96	Eastern White Pine	*Pinus strobus*	Good
P103	16-18	5.1-5.73	Eastern White Pine	*Pinus strobus*	Good
P104	18	5.73	White Mulberry	*Morus alba*	Good
P105	25	7.96	Eastern White Pine	*Pinus strobus*	Good
P106	20	6.37	Eastern White Pine	*Pinus strobus*	Good
P107	21	6.69	American Linden	*Tilia americana*	Good
P108	21	6.69	American Linden	*Tilia americana*	Good
P109	21	6.69	American Linden	*Tilia americana*	Fair
P110	18	5.73	American Linden	*Tilia americana*	Fair
P111	22	7	American Linden	*Tilia americana*	Fair
P112	22	7	American Linden	*Tilia americana*	Fair
P113	18	5.73	American Linden	*Tilia americana*	Fair
P114	24	7.64	American Linden	*Tilia americana*	Fair
P115	18	5.73	Sawtooth Oak	*Quercus acutissima*	Fair
P116	24	7.64	Sawtooth Oak	*Quercus acutissima*	Fair
P117	24	7.64	Sawtooth Oak	*Quercus acutissima*	Fair
P118	25	7.96	Sawtooth Oak	*Quercus acutissima*	Fair
P119	21	6.69	Sawtooth Oak	*Quercus acutissima*	Fair
P120	25	7.96	Sawtooth Oak	*Quercus acutissima*	Fair
P121	20	6.37	Sawtooth Oak	*Quercus acutissima*	Fair
P122	16	5.1	Sawtooth Oak	*Quercus acutissima*	Fair
P123	17	5.41	Sawtooth Oak	*Quercus acutissima*	Fair
P124	18	5.73	Sawtooth Oak	*Quercus acutissima*	Fair
P125	19	6.05	Sawtooth Oak	*Quercus acutissima*	Fair
Trees Located Along the Promenade					
P126	23	7.32	Sawtooth Oak	*Quercus acutissima*	Fair
P127	26	8.28	Sawtooth Oak	*Quercus acutissima*	Fair
P128	16	5.1	Sawtooth Oak	*Quercus acutissima*	Fair

Table E-4 (cont'd)
Tree Species Located Adjacent to the Proposed Project Area

Code	Circumference (inches)	DBH (inches)	Common Name	Latin Name	Health
P129	24	7.64	Sawtooth Oak	*Quercus acutissima*	Fair
P130	25	7.96	American Linden	*Tilia americana*	Good
P131	23	7.32	American Linden	*Tilia americana*	Good
P132	26	8.28	American Linden	*Tilia americana*	Good
P133	26	8.28	American Linden	*Tilia americana*	Good
P134	24	7.64	American Linden	*Tilia americana*	Good
P135	19	6.05	American Linden	*Tilia americana*	Good
P136	23	7.32	American Linden	*Tilia americana*	Good
P137	23	7.32	American Linden	*Tilia americana*	Good
P138	23	7.32	Honey Locust	*Gleditsia triacanthos*	Good
P139	16	5.1	Honey Locust	*Gleditsia triacanthos*	Good
P140	15	4.77	Honey Locust	*Gleditsia triacanthos*	Good
P141	21	6.69	Honey Locust	*Gleditsia triacanthos*	Good
P142	21	6.69	American Linden	*Tilia americana*	Good
P143	21	6.69	American Linden	*Tilia americana*	Good
P144	20	6.37	American Linden	*Tilia americana*	Good
P145	48	15.29	Honey Locust	*Gleditsia triacanthos*	Poor
P146	27	8.6	American Linden	*Tilia americana*	Good
P147	26	8.28	American Linden	*Tilia americana*	Good
P148	16	5.1	American Linden	*Tilia americana*	Good
P149	53	16.88	Honey Locust	*Gleditsia triacanthos*	Poor
P150	18	5.73	American Linden	*Tilia americana*	Good
P151	18	5.73	American Linden	*Tilia americana*	Good
Trees Located Along the Shoreline					
S1	18	5.73	Red Mulberry	*Morus rubra*	Good
S2	12.5	3.98	Red Mulberry	*Morus rubra*	Good
S3	12	3.82	Red Mulberry	*Morus rubra*	Good
S4	21	6.69	Cottonwood	*Populus deltoides*	Good
S5	34	10.8	Cottonwood	*Populus deltoides*	Good
S6	15	4.78	Tree-of-Heaven	*Ailanthus altissima*	Fair
S7	22	7	Cottonwood	*Populus deltoides*	Good
S8	36	11.46	Chinese Elm	*ulmus parvifolia*	Fair
S9	14	4.46	Black Locust	*Robinia pseudoacacia*	Good
S10	39	12.42	Cottonwood	*Populus deltoides*	Good
S11	14	4.46	Tree-of-Heaven	*Ailanthus altissima*	Good
S12	13	4.14	Tree-of-Heaven	*Ailanthus altissima*	Fair-Poor
S13	15	4.78	Tree-of-Heaven	*Ailanthus altissima*	Fair-Poor
S14	16	5.1	Tree-of-Heaven	*Ailanthus altissima*	Fair
S15	30	9.55	Red Mulberry	*Morus rubra*	Good
S16	14-15	4.46-4.78	Tree of Heaven	*Ailanthus altissima*	Fair
S17	14	4.46	Red Maple	*Acer rubrum*	Fair

WILDLIFE

Due to the location of the proposed project area, an assessment of the avian species utilizing the proposed project area and surrounding vicinity was completed using observation point stations located along the adjacent promenade. Monthly avian surveys were conducted at 12 locations (**Figure B-28**) from January to June 2012 to document the breeding, spring migration and winter seasons. Locations PS-1 to PS-5 were east of the proposed project area, Locations PS-6 to PS-9

were within the proposed project area, and Locations PS-10 to PS-12 were north and west of the proposed project area. The surveys were conducted as close as possible to the predicted morning low tide to facilitate observations and document use of tidal mudflats and nearshore areas. A total of 29 species, comprised of 1,485 individuals, were directly observed in the proposed project area during the surveys, with the most abundant species being ring-billed gulls (*Larus delawarensis*) and ruddy ducks (*Oxyura jamaicensis*) (Table E-5). In addition, incidental sightings were recorded during other field activities conducted in support of the proposed project (e.g., wetland delineations, sediment sampling and tree surveys). These incidental sightings were recorded during the months of December 2011 and May and June of 2012 (Table E-6). There were two bird species observed incidentally that were not observed during the monthly surveys: a single red-throated loon (*Gavia stellata*) and a single American coot (*Fulica americana*) which were observed during wetland delineation surveys in December 2011.

Table E-5
Species Observations During Monthly Surveys

	Overwintering		Spring Migration		Nesting		Total
	January	February	March	April	May	June	
Species							
Bufflehead	26	23	29				78
Black Duck	3	10	4	5	2	5	29
Mallard	58	75	3	5	4	4	149
Herring Gull	1	4		2	1	2	10
Ring-billed Gull	32	191	1	6	13	10	253
Ruddy Duck	133	109	1				243
Common Merganser	2						2
Canvasback	3						3
Canada Goose	135	8	1				144
Scaup	54	109					163
Gadwall	17	11	42				70
Double Crested Cormorant		1		6		7	14
Pintail		1					1
Rock Pigeon		6	39	25	58	7	135
Red Breasted Merganser			8				8
Brant			5	66			71
Great Egret				3	1	2	6
Kingfisher				1			1
European Starling				2	14	3	19
Common Tern				3	17		20
Snowy Egret					2		2
Greater Yellowlegs				5			5
Barn Swallow					4		4
Black Backed Gull					2		2
Laughing Gull					3		3
Semipalmated Plover					25		25
Least Sandpiper					23		23
Osprey						1	1
Black Crowned Night Heron						1	1

Table E-6
Incidental Sightings

Date	Species	Approximate Count	Fieldwork
12/12/2011	Mallard	80	Wetland delineation
12/12/2011	Black Duck	60	Wetland delineation
12/12/2011	Bufflehead	200	Wetland delineation
12/12/2011	Brant	40	Wetland delineation
12/12/2011	Scaup	20	Wetland delineation
12/12/2011	Double-crested Cormorant	3	Wetland delineation
12/12/2011	Canada Goose	400	Wetland delineation
12/12/2011	Gadwall	20	Wetland delineation
12/12/2011	Blue Heron	1	Wetland delineation
12/12/2011	Ruddy Duck	20	Wetland delineation
12/12/2011	Ring-billed Gull	40	Wetland delineation
12/12/2011	Herring Gull	10	Wetland delineation
12/13/2011	Mallard	80	Wetland delineation
12/13/2011	Black Duck	20	Wetland delineation
12/13/2011	Canada Goose	100	Wetland delineation
12/13/2011	Ruddy Duck	40	Wetland delineation
12/13/2011	Double-crested Cormorant	4	Wetland delineation
12/13/2011	Bufflehead	40	Wetland delineation
12/13/2011	Red-throated Loon	1	Wetland delineation
12/13/2011	Scaup	8	Wetland delineation
12/13/2011	Herring Gull	10	Wetland delineation
12/13/2011	Ring-billed Gull	50	Wetland delineation
12/14/2011	Canada Goose	150	Wetland delineation
12/14/2011	Mallard	40	Wetland delineation
12/14/2011	Black Duck	60	Wetland delineation
12/14/2011	Gadwall	60	Wetland delineation
12/14/2011	Bufflehead	20	Wetland delineation
12/14/2011	Double-crested Cormorant	2	Wetland delineation
12/14/2011	Brant	150	Wetland delineation
12/14/2011	Red-throated Loon	1	Wetland delineation
12/14/2011	Herring Gull	6	Wetland delineation
12/14/2011	Ring-billed Gull	20	Wetland delineation
12/14/2011	Black Backed Gull	2	Wetland delineation
12/14/2011	Common Merganser	1	Wetland delineation
12/14/2011	American Coot	1	Wetland delineation
12/14/2011	Great Blue Heron	1	Wetland delineation
5/9/2012	Brant	40	Pore water sampling
5/9/2012	Black Crowned Night Heron	2	Pore water sampling
5/10/2012	Brant	50	Pore water sampling
5/10/2012	Snowy Egret	2	Pore water sampling
5/10/2012	Great Egret	1	Pore water sampling
5/10/2012	Common Tern	25	Pore water sampling
5/10/2012	Ring-Billed Gull	15	Pore water sampling
5/10/2012	Double-crested Cormorant	8	Pore water sampling
6/5/2012	Black Crowned Night Heron	2	Benthic Sampling
6/5/2012	Common Tern	20	Benthic Sampling

Based on these observations, the following species are present at the proposed project area during the winter, spring and summer months: American black duck (*Anas rubripes*), mallard (*Anas platyrhynchos*), herring gull (*Larus argentatus*), ring-billed gull, and rock pigeon (*Columba livia*). During the winter months, bufflehead (*Bucephala albeola*), American black duck, mallard, gadwall (*Anas strepera*), herring and ring-billed gulls, ruddy duck, common merganser (*Mergus merganser*) and canvasback (*Aythya valisineria*). Canada geese (*Branta canadensis*) and brant (*Branta bernicia*) were observed loafing on the open-water areas of the bay in the winter months. Herons and egrets used the inner bay as a feeding area dependent upon the tidal cycle. Snowy egret (*Egretta thula*), great egret (*Ardea alba*), and great blue herons (*Ardea herodias*) were observed foraging in the spring months along the tide line principally on the northern edge (Locations PS-10 – PS-12) of the proposed project area. Gulls were commonly observed using the pile caps, floating breakwaters, and the remnants of Pier 2 within the proposed project area as resting sites. Common terns (*Sterna hirundo*) were observed foraging over the bay and using the marina and breakwater piles as resting sites in the spring.

In general, waterfowl use was lowest in the areas east of the proposed project area (Locations PS-1 to PS-5). Small flocks of waterfowl (principally ruddy ducks and bufflehead; species deemed non-hazardous by FAA) were observed between the finger slips by Pier 1. The largest numbers of puddle ducks (black, mallard and gadwall) were observed feeding or loafing near the mouth of outfall BB-008 or on the adjacent mudflats within the proposed project area. Diving ducks (ruddy ducks and bufflehead) were also observed within the proposed project area, often being observed proximate to or within the debris boom at the mouth of outfall BB-006. While large flocks of Canada geese and sea gulls were observed at high tide west and north of the proposed project area (Locations PS-10 to PS-12), this area was exposed during the observation surveys which were centered on the low tide. Herons and egrets were observed most often at Locations PS-10 to PS-12.

Mammals observed in the upland and nearshore portions of the study area consisted of Norway rats (*Rattus norvegicus*) and feral cats (*Felis domesticus*). No reptiles or amphibians were observed during the site surveys.

SIGNIFICANT, SENSITIVE, OR DESIGNATED RESOURCES

The proposed project area is located within the City's Waterfront Revitalization Program's designated East River - Long Island Special Natural Waterfront Areas (SNWAs)

Correspondence received from the NHP on August 13, 2012 indicated that there were "no records or known occurrences of rare or state-listed animals, plants, significant natural communities or other significant habitats" at or in the immediate vicinity of the proposed project area. A review of the USFWS files indicated that three federally-listed or proposed threatened or endangered species under their jurisdiction are known to occur within Queens County, NY. These species are the endangered roseate tern (*Sterna dougallii)*, the threatened piping plover (*Charadrius melodus*) and a threatened plant, the seabeach amaranth (*Amaranthus pumilus).* These species were not observed during the site investigations.

The seabeach amaranth is an annual plant that is found on sandy beaches above the high tide line. Roseate terns breed on barrier islands, such as those in Long Island Sound, and begin arriving to these areas at the end of April. Terns typically breed through the summer and then migrate south starting in late August/early September (USFWS 2011). Roseate terns often forage and nest with common terns, which have been observed flying over or foraging at the proposed project area during the April and May surveys. Piping plovers prefer flat and open sandy

beaches with minimal vegetation cover for breeding, such as those found along the sandy beaches of Long Island Sound. Piping plovers arrive at their breeding sites in early to mid-March and breed through early September before migrating south (USFWS 2007). These species start their migration in the fall.

C. FUTURE WITHOUT THE PROPOSED PROJECT

Without the proposed project, existing conditions would remain unchanged. There would be no removal of accumulated CSO sediments, and continued accumulation of deposits in the proposed project area is anticipated. Low water depths and inadequate tidal exchange would potentially accelerate the rate of sediment deposition in nearshore areas. Odors associated with tidally-exposed CSO sediments would continue to detract from the public use and enjoyment of the promenade, marinas, and other nearshore areas along Flushing Bay. Without the removal of sediment, the potential for Pier 2 to be returned to use at some point and the access and use of portions of the marina by recreational boaters at Pier 3 would continue to be affected by increasingly limited water depths due to CSO deposition.

Water quality would be expected to improve beyond current conditions in association with CSO reductions gained from DEP's WWFP improvements to the sewer infrastructure, which include regulator modifications, sewer projects, and upgrades to the Bowery Bay Wastewater Treatment Plant.

The benthic macroinvertebrate community would continue to be dominated by opportunistic, pollution-tolerant species. Poor water quality and twice daily natural tidal exposure would further limit expanded use of the proposed project area by benthic macroinvertebrates. Fish usage in the proposed project area would continue to be restricted by low water depth and poor water quality. Bird usage on the inner bay would be expected to remain unchanged without the proposed project. The dilapidated Pier 2 and mudflats around outfall BB-006 would continue to provide resting and foraging areas for gulls and waterfowl.

Intertidal wetlands would continue to be dominated by unvegetated mudflats that offer limited habitat for fish. The mudflats would continue to provide foraging opportunities for bird species deemed hazardous by FAA. The acreage of the saltmarsh cordgrass-dominated vegetated wetlands would continue to be limited in the proposed project area, due primarily to unsuitable (organic) substrates and inadequate tidal exchange.

No change in terrestrial vegetation or habitats would result in the future without the proposed project.

D. FUTURE WITH THE PROPOSED PROJECT

FLOODPLAIN

The proposed project would have no short-term or long-term adverse effect on floodplain resources. An incremental benefit may be realized by a slight increase in the water-holding capacity of the dredged portions of the inner bay.

WATER QUALITY

Under the proposed project, dredging would be conducted through the use of hydraulic and/or mechanical dredging methods. The proposed project would be conducted on a year-round basis to minimize dredging during summer seasons and to allow dredging to occur when dissolved oxygen levels are higher and recreational boat traffic would be less, typically during winter

months. Potential water quality impacts associated with dredging include a temporary increase in turbidity due to resuspended sediments and limited and short term reductions in dissolved oxygen due to biological activity in the suspended sediments. Mechanical dredging with an environmental bucket would result in a higher percentage of solids within the dredged materials. Therefore, turbidity curtains would be used to confine all active dredge areas in order to limit potential water quality impacts. Dredged material would be placed in barges, then potentially into smaller scows and finally, transferred to larger barges. Potential discharge of decant waters would only occur after dredge materials have had at least 24 hours to settle within the barge. Any discharge of decant waters would be pumped to the dredging area and discharged within those areas protected by turbidity curtains. In addition, the use of a spill plate between barges for transloading dredged materials from smaller to larger barges would also be used to reduce potential spillback during transfer. All discharge of return waters or decant waters would be to the point of dredging and within the limits of turbidity curtains. Further information on protective measures to be taken during construction can be found in Section G, "Construction." These proper dewatering techniques would help to minimize potential water quality impacts.

Restoration of wetlands as part of the proposed project would also be required. Restoration would involve the placement of clean fill material to create an appropriate grade, to establish new intertidal and high marsh. Silt curtains and other appropriate best management practices would be used to limit the resuspension of materials and would be employed during restoration.

The proposed project would not result in any long-term or significant adverse impacts to water quality and no further assessment is required. The proposed project would likely improve water circulation and improve water quality. Therefore, the proposed project would not result in potential significant adverse impacts with respect to water quality.

SEDIMENT QUALITY

The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. The dominant classifications of the sediments that would be removed are Class B or Class C. The TOGS 5.1.9 guidance would be followed for dredged material management and the restrictions of the most stringent classification (Class C) would be achieved. Under the proposed project, sediments would be removed to a depth of approximately four feet below MLLW to reduce sediments that are currently exposed at low tide and the associated odors. Based upon a comparison of individual TOGS 5.1.9 parameters, the sediment contamination characteristics within the proposed project depth and the sediment horizons that would be exposed after dredging are largely the same. Classifications and concentrations of the contaminant parameters are consistent between these two sediment horizons. Therefore, the proposed project would not result in the exposure of highly contaminated sediments. Rather, the proposed project would expose contaminated sediments that are comparable with the materials to be removed. Therefore, the proposed project would not result in potential significant adverse impacts related to sediment quality.

WETLANDS

Under the proposed project, existing littoral zone wetlands would be temporarily affected during construction. The habitat, however, would remain as littoral zone and water depths would remain below six feet at MLW at the completion of the proposed project. The proposed project would affect approximately 2.3 acres of mudflat wetlands. As part of the proposed project, on-

site wetland restoration would occur. Proposed restoration would involve the development of approximately 3.18 acres of wetlands, consisting of 2.33 acres of intertidal marsh, 0.57 acres of high marsh habitat (saltmarsh cordgrass (*Spartina alterniflora*) and salt meadow cordgrass (*Spartina patens*)), and 0.28 acres of mudflats. The proposed restoration would be developed along the length of the proposed project area with the exception of the areas in immediate proximity to outfalls BB-006 and BB-008 and other areas with significant existing slopes. In addition, existing mudflat soils in the proposed project area that have been affected by discharges from the CSO outfalls would be excavated as part of the restoration effort.

Therefore, the proposed project would not result in potential significant adverse impacts with respect to wetlands. Further information on the wetland restoration program is contained in the Joint Application for Permit and supporting documentation.

BENTHIC COMMUNITY

The proposed project would temporarily affect existing benthic communities within the proposed project area. However, results of the benthic sampling indicated that the communities within the proposed project area are impaired, comprised primarily of pollution tolerant species and display lower levels of taxa richness and diversity in comparison to those from less disturbed reference areas. The proposed project would remove existing accumulated sediments and it is anticipated that dredged areas would readily re-colonize over time from adjacent areas that would not be dredged and currently support a benthic community comparable to the proposed project area. Opportunistic species typically colonize first, resulting in high numbers of organisms, but low species diversity. As less mobile species (shellfish) colonize the proposed project area and predator-prey relationships are re-established, the species diversity would be expected to increase. The proposed project would incrementally improve the benthic community, due to projected improved water quality and tidal circulation. Therefore, the proposed project would not result in potential significant adverse impacts with respect to benthic community.

FISH AND ICHTHYOPLANKTON

Flushing Bay is designated as Essential Fish Habitat (EFH) by NOAA for 17 managed species. Results of a separate EFH analysis conducted as part of the proposed project concluded that only 8 of the 17 managed fish species (winter flounder, scup (*Stenotomus chrysops*), black sea bass (*Centropristus striata*), red hake (*Urophycis chuss*), Atlantic butterfish, bluefish, windowpane and summer flounder (*Paralichthys dentatus*) could potentially be located in the proposed project area. The EFH assessment concluded that the proposed project would not result in potential significant adverse impacts to EFH or species of concern given the existing degraded water quality and sediment conditions, as well as the shallow intertidal water depths within the proposed project area.

A Habitat Characterization Study was completed for the proposed project area in accordance with a NYSDEC Region 2 approved work plan (approved January 4, 2012). The study determined that the existing physical, water quality and sediment quality characteristics of the bay within and in close proximity to the proposed project area are not suitable for overwintering by striped bass. Habitat value for winter flounder was also determined to be marginal. Based upon the evaluation of existing conditions, NYSDEC concurred in a May 2, 2012 letter that the applicability of in-water work windows for winter flounder and striped bass within the proposed project area in Flushing Bay area would be waived as it was unlikely that these two species would utilize the proposed project area. As a result, dredging activities would be conducted on a

year-round basis to minimize dredging during summer seasons and allow for dredging to occur when dissolved oxygen levels are higher and recreational boating traffic is less, typically during winter months.

In general, the proposed project area is very shallow intertidal habitat and does not currently serve as important or unique fish habitat. The proposed project would temporarily affect demersal (i.e., bottom-oriented) species. Short-term effects may include increased turbidity, water disturbance, noise, vibrations and changes in water depth. Slight turbidity increases in the surrounding waters may occur which could affect certain species that are sensitive to water quality fluctuations or rely on sight feeding. However, turbidity in Flushing Bay is naturally highly variable, depending on freshwater inflow, tidal re-suspension, storms, and other factors. In addition, potential increases in suspended solids and turbidity would be minimized through the use turbidity curtains, in conjunction with other appropriate and applicable best management practices such as an environmental (sealed) bucket or controlled hoist speeds, which would minimize any short-term effects on the fish community. All discharge of return waters or decant waters would be to the point of dredging and within the limits of turbidity curtains. These proper dewatering/decanting techniques would help to minimize potential impacts to fish. In addition, fish species within or near the proposed project area would likely relocate during active dredging activities to other areas of the bay and repopulate the proposed project area when dredging is complete.

The primary indirect impact to fish from the proposed project would be the effect of the in-water construction on benthic communities. Finfish species that are demersal, or benthic feeders, may experience a temporary reduction in feeding efficiency during and immediately following in-water construction. Following the recolonization of the benthic community, finfish would follow per natural succession, thus restoring the original benthic community within one to five years (Newell *et al.,* 1998).

The proposed project would have a potential temporary though localized effect on fish use in the proposed project area. Potential effects, however, would be reduced through the use of sealed (environmental) buckets for mechanical dredging, use of turbidity curtains, and the controlled dewatering/decanting of dredged material to minimize any localized water quality impacts. Therefore, the proposed project would not result in potential significant adverse impacts with respect to fish and ichthyoplankton.

TERRESTRIAL VEGETATION

Under the proposed project, upland areas would not be affected. Therefore, the proposed project would not result in potential significant adverse impacts with respect to terrestrial vegetation.

WILDLIFE

As previously discussed, the proposed project would result in the loss of existing mudflat habitat and expansion of vegetated wetlands and permanently inundated areas. The proposed restoration would alter the existing mudflat habitat and could result in a change of avian species that utilize the area. The proposed restoration would provide a low marsh and high marsh habitat complex that would be attractive to smaller shorebirds, while discouraging to larger birds, including geese and seagulls. The intent of the proposed restoration is to create habitat that increases species diversity while reducing risks to the nearby LaGuardia Airport. The Federal Aviation Administration (FAA) considers geese and gulls hazardous to aircraft operations based on their size and flocking nature.

The tidal regime that would be established at the proposed restoration site would periodically drain and flood the site, preventing both nesting and long-term loafing by larger waterfowl. Areas adjacent to the proposed project would be re-profiled to ensure that a complete tidal exchange takes place. Any depressions would be contoured to preclude ponding and trapping of floatables and other man-made debris that may attract nuisance bird species. The proposed densely-planted, saltmarsh cordgrass-dominated low marsh habitat would not be attractive to Canada geese, puddle ducks (mallard, black duck or gadwall) or roosting flocks of gulls. Additional information, including protective measures to be taken during construction, can be found in Section G, "Construction."

Short-term effects on the avian community from the proposed project and restoration would consist of displacement of waterfowl and other birds during construction and the potential attraction of gulls to feed on organisms disturbed by the dredging. Alternate habitat exists for any temporarily displaced birds in nearby Flushing Creek, outer Flushing Bay, Little Neck Bay and Alley Creek. The use of foaming agents for odor control would reduce the potential for gulls to gather at the proposed project area. The contractor would be instructed to implement appropriate bird control measures during construction to minimize potential bird issues. Further information on protective measures to be taken during construction can be found in Section G, "Construction."

Potential long-term effects on the avian community from the proposed project include a reduction in shallow water or exposed mudflat habitat for puddle ducks and shorebirds. This decrease could also cause a reduction in feeding opportunities for puddle ducks. Likewise, feeding and loafing habitat for diving ducks may be increased due to the newly dredged areas of the bay being tidally inundated for a greater period of time each day. The deepening of some portions of the inner bay may cause a slight shift to waters further offshore immediately following dredging until the benthic macroinvertebrate community becomes re-established. While seagull use of the inner bay would not be significantly affected by dredging, foraging opportunities for seagulls may be decreased by the reduction in the acreage of tidally exposed mudflats. While ring-billed gulls were identified as a predominant species in Flushing Bay, the proposed project would not be expected to result in a significant change in their numbers. Removal of some of the piles at Pier 2 may result in increased seagull use of the remaining marina piles and the floating breakwater as resting sites.

The removal of historic fill at Pier 2 and creation of expanded vegetated wetlands are expected to reduce use by Canada geese (exclusion measures would likely be required to keep geese out of the mitigation plantings until these are fully established). Heron and egret use is not expected to be significantly affected, although foraging time on each tidal cycle may be reduced through the deepening of some nearshore waters. As stated above, nearby alternate habitat exists for waterfowl and shorebirds. Therefore, the proposed project would not result in potential significant adverse impacts with respect to wildlife.

Overall, the proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. The proposed project includes several best management practices to reduce any potential long-term or short-term impacts to natural resources during construction. The proposed project also includes a wetland restoration plan. Therefore, the proposed project would not result in potential significant adverse impacts to natural resources.

SIGNIFICANT, SENSITIVE, OR DESIGNATED RESOURCES

Based on the life history and habitat requirements of the USFWS-listed species, the proposed project would have no short-term or long-term negative effect on significant, sensitive or designated resources. Additional information addressing protective measures during construction (turbidity curtains, controlled decanting or dewatering of dredged materials, and visual monitoring of turbidity during dredging operations) can be found in Section G, "Construction."

E. REFERENCES

U.S. Department of Transportation Federal Aviation Administration. Advisory Circular: Hazardous Wildlife Attractants on or Near Airports. AC No. 150/5200-33B, August 28, 2007.

Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Federal Emergency Management Agency. Flood Insurance Rate Map No. 3604970113. Panel 113 of 457.

HydroQual, Inc. 2001-2002. Use and Standards Attainment Project: Flushing Bay and Creek Benthos and Finfish Characterization Field Sampling and Analysis Program.

New York State Department of Environmental Conservation. 2005. Administrative Order on Consent (CO2-20000107-8, DEC Case No. CO2-20110512-25). By City of New York and New York City Department of Environmental Protection. Modified October 2011.

New York State Department of Environmental Conservation. "Environmental Resource Mapper." Available at http://www.dec.ny.gov/imsmaps/ERM/viewer.htm.

New York State Department of Environmental Conservation. 1974. "Tidal Wetland Maps" Map No. 596-512.

New York State Department of Environmental Conservation. Chapter X – Division of Water. Part 935 – Classifications of Standards and Purity for Upper East River and Long Island Sound Within Queens, Bronx and Westchester Counties.

New York State Department of Environmental Conservation – Chapter X – Division of Water. Part 701 – Classifications for Surface Waters and Ground Waters.

New York State Department of Environmental Conservation. November 2004 Technical & Operational Guidance Series (TOGS) 5.1.9 - In-Water and Riparian Management of Sediment and Dredged Material.

New York State Department of Environmental Conservation (NYSDEC). 2004. Technical & Operational Guidance Series (TOGS) version 5.1.9. Accessed at http://www.dec.ny.gov/docs/water_pdf/togs519.pdf on January 15, 2012.

New York State Department of Environmental Conservation. 2005. Administrative Order on Consent (CO2-20000107-8, DEC Case No. CO2-20110512-25). By City of New York and New York City Department of Environmental Protection. Modified March 8, 2012.

New York City Department of Environmental Protection (DEP). 2012a. Final Sediment, Surface Water and Porewater Sampling Summary Report. Prepared by AECOM/HydroQual, a Joint Venture. September 2012.

New York City Department of Environmental Protection (DEP). 2012b. Habitat Characterization Study for Winter Flounder and Striped Bass, Flushing Bay. Prepared by AECOM/HydroQual, a Joint Venture. April 2012.

New York City Department of Environmental Protection (DEP). 2012c. Final Intertidal and Subtidal Benthos Sampling Report Prepared by AECOM/HydroQual, a Joint Venture. September 2012.

New York City Department of Environmental Protection (DEP), Bureau of Environmental Engineering. 2011. The Flushing Bay Waterbody/Watershed Facility Planning Report. August 2011.

New York City Department of Environmental Protection (DEP). 2011. New York Harbor Water Quality Survey Data. Station E15.

New York State Office of Parks, Recreation & Historic Preservation. New York State Historic Preservation Office. GIS Database. Available at http://www.nysparks.com/shpo/onlinetools/ Northern Ecological Associates, Inc. (NEA). 2002. Final Finfish Report: Flushing Bay and

Creek Ecological Restoration Project. Prepared for the U.S. Army Corps of Engineers. March 2002.

Personal Communication. Jean Petrusiak, New York State Department of Environmental Conservation, New York Natural Heritage Program. Letter of August 13, 2012 to Ms. Erin Roth of HDR|HydroQual.Personal Communication. Joseph DiMura, New York State Department of Environmental Conservation. Letter of May 10, 2012 to Mr. Anthony Maracic of New York City Department of Environmental Protection.

URS. 1986. Preliminary Engineering Report: Dredging of Flushing Bay and Creek for Odor Abatement.

U.S. Fish and Wildlife Service. National Wetlands Inventory. “Wetlands Mapper.” Accessed 09 August 2012. http://107.20.228.18/Wetlands/WetlandsMapper.html

U.S. Fish and Wildlife Service. May 2007. Piping Plover Project Review Fact Sheet. New York Field Office. Accessed 16 August 2012.
www.fws.gov/northeast/nyfo/es/PipingPloverFactSheet07.pdf

U.S. Fish and Wildlife Service. May 2011. Roseate Tern: North American Subspecies (*Sterna dougallii dougallii*) Fact Sheet. Accessed 16 August 2012.
www.fws.gov/northeast/pdf/Roseatetern0511.pdf

U.S. Fish and Wildlife Service. New York Field Office. Seabeach Amaranth Fact Sheet. Accessed 16 August 2012. http://www.fws.gov/northeast/nyfo/info/factsheets/amaranth.pdf

A. INTRODUCTION

In accordance with the *2012 CEQR Technical Manual*, an evaluation was conducted to determine whether the proposed project would increase the exposure of people or the environment to hazardous materials. A hazardous material is any substance that poses a threat to human health or the environment. As part of the hazardous materials assessment, existing documentation was reviewed, a Phase I level Environmental Site Assessment (ESA) was conducted and data from sediment and water quality sampling conducted as part of the proposed project were reviewed to determine the nature and extent of potential chemical contamination of accumulated sediment Flushing Bay within the proposed project area.

The Phase I level ESA included a review of topographic maps, historical Sanborn® Fire Insurance Maps, historical aerial photographs of the site, regulatory databases and site reconnaissance. An environmental information database search was performed for the site by Environmental Data Resources, Inc (EDR) on August 13, 2012, which included federal, state, local, tribal and EDR proprietary databases as defined by ASTM E 1527 – 05. Each database that identified a site is discussed below.

B. EXISTING CONDITIONS

The proposed project area is located within Flushing Bay and is generally bounded by LaGuardia Airport to the north and west, by the existing Pier 3 of World's Fair Marina to the east and by the waterfront promenade of Flushing Meadows-Corona Park and World's Fair Marina to the south. A portion of the proposed project area encompasses the water-borne operations of the World's Fair Marina, which is also owned and operated by the NYCDPR.

A review of Sanborn® Fire Insurance Maps was conducted for the years: 1902, 1914, 1931, 1950, 1981, 1982, 1986, 1988, 1989, 1991, 1992, 1994, 1995, and 2001 – 2006. This review indicated that Flushing Bay has been used for recreational boating since the early 1900's and that the shoreline and surrounding vicinity have been developed since 1902. By 1914, several docks, boat houses and bath houses were present along the shoreline and, by the 1950's, additional infrastructure was present, including roadways, gas stations, Shea Stadium and the Old World's Fair Marina (Pier 1). Throughout the early decades of the 1900's natural wetlands in the vicinity of Flushing Bay were filled to accommodate the expansion of water-dependent industrial, commercial and recreational land uses with waterfront access for shipping and boating. The State and City of New York also performed extensive land filling and construction in areas adjacent to the bay as part of the construction and expansion of LaGuardia Airport and Grand Central Parkway and in preparation of the site for the 1939 and 1964/65 World's Fairs.

The regulatory and environmental databases review identified a total of 16 sites; however, none were considered a significant area of concern due to their nature and location in proximity to the proposed project area. These sites included a properly closed and continually managed state hazardous waste site located 0.75 miles from the proposed project area, within the College Point section of Queens. Twelve leaking storage tanks were identified within a 0.5 mile search radius,

one of which was associated with the World's Fair Marina and involved 100 gallons of unknown petroleum being spilled onto the surface water as a result of a tank overfill. This leaking storage tank site was closed by the NYSDEC in 1992. A "closed" leaking storage tank or spill means that no further remedial activities are necessary at the site or the case was closed for administrative reasons. A review of the additional 11 identified leaking storage tanks in the NYSEDC SPILLS database confirmed that all of the reported leaks identified in the database within a one-half mile radius of the proposed project area were also closed.

A review of the underground storage tank (UST) database identified one site 0.18 miles southwest of the proposed project area on Astoria Blvd, containing three USTs that are temporarily out of service. The UST database contains registered USTs that are regulated by the Resource Conservation and Recovery Act (RCRA) and are listed on the NYSDEC's petroleum bulk storage (PBS) database. This site was also identified on the aboveground storage tank (AST) database and contains one AST containing 250 gallons of used oil. Similar to the UST database, the AST database contained registered ASTs that are listed on the NYSDEC's PBS database. A review of the RCRA infodatabase identified two RCRA non-generator sites (gas stations) within 0.25 miles of the proposed project area. This database contains information on sites that generate, transport, store, treat and dispose of hazardous waste. Non-generator sites do not presently generate hazardous waste, but have been assigned an identification number by the U.S. Environmental Protection Agency (EPA). Due to the distance and nature of the identified sites with respect to the location of the proposed project; adverse impacts are not anticipated.

SITE RECONNAISSANCE

A site reconnaissance was conducted to observe the present use and condition of the proposed project area on August 28, 2012. The southern portion of the proposed project area is occupied by Piers 2 and 3 of the World's Fair Marina. The landward area immediately adjacent and south of the proposed project area contains the land-based operations of the World's Fair Marina including a large parking area, restaurant and banquet hall, boat storage and additional uses that support the marina operations. No pumpout or fueling stations exist at Piers 2 or 3. A hydraulic boat lift is located at the World's Fair Marina adjacent to the proposed project area at the western end of the marina complex. A waste oil tank utilized by the marina is stored in a concrete building along the waterfront promenade, adjacent to the proposed project area, on the northwestern side of the banquet hall. Within the fenced boat yard at the marina, adjacent to Grand Central Parkway, southwest of the proposed project site, waste oil from boat repairs is disposed of in 55-gallon drums that are stored on spill containment pallets within a work shed on the property. Three drums containing waste cooking oil were also observed next to the World's Fair Marina building during the site reconnaissance. Based upon observations of the drum storage locations, there was no visual indication of any prior or recent spills. No sampling, testing or laboratory analysis of surface soil, overburden, groundwater or other substances was conducted as part of the Phase I ESA. Visual inspection of the site and active marina showed several areas of oil sheen on the surface waters within Flushing Bay that are likely attributable to the many vessels that operate and dock in the vicinity of the active marina. Two CSO outfalls (BB-006 and BB-008) are located at the eastern and western edge of the proposed project area. Likewise, the shoreline is lined with riprap and covered with household refuse and remnants of docks, boats and piers. East of the proposed project area is World's Fair Marina Pier 1, which includes of a boat fueling station that provides both diesel and unleaded fuel. West of the proposed project area is another CSO outfall (BB-007) located along the shoreline at the western terminus of the waterfront promenade, approximately one-third of a mile northwest of outfall BB-008. LaGuardia Airport is located to the north of the proposed project area.

Based upon the results of the Phase I level ESA and a review of historical records, regulatory databases and site reconnaissance no "recognized environmental conditions" were identified that would require a Phase II ESA. Sediment, surface water and porewater sampling was conducted to support both the proposed project and the handling of the materials during dredging. The results of this sampling are discussed below under *Sampling Results*.

FIELD INVESTIGATIONS

In addition to and independent of the review of historic records and site reconnaissance, sediment sampling was completed in support of the proposed project within Flushing Bay. Sediment cores were collected at 20 locations within the proposed project area during late April through early May of 2012. These samples were collected at five feet below mean lower low water (MLLW) and from an additional one foot below that depth. The proposed project within Flushing Bay would occur at a depth of four feet below MLLW with an overdredge of one foot. Additional deeper sediment sampling was conducted within the footprint of Pier 3 (**Figure B-29**) at five locations to determine if the removal of additional sediments would result in the exposure of similar or less contaminated material. These deeper samples were acquired within a range of depths from 6.5 to 8.5 feet below MLLW.

The sediment sampling locations are shown in **Figure B-29**. Sediment samples were analyzed for BTEX (benzene, toluene, ethylbenzene and xylene), metals (arsenic, cadmium, copper, lead and mercury), polycyclic aromatic hydrocarbons (PAHs), total polychlorinated biphenyls (PCBs), pesticides (DDD+ DDT+DDE, mirex, chlordane and dieldrin), grain size, and total organic carbon (TOC). Results of these analyses were used to characterize the sediments to be dredged, as well as the sediments that would be exposed as a result of the proposed project.

In addition to sediment sampling, surface water samples were collected to provide a baseline understanding of existing surface water quality and were analyzed for the same parameters as the sediments in addition to total suspended solids. In addition, porewater analyses were conducted to provide a representative characterization of the decant or elutriate water that may potentially be associated with the sediment to be exposed after dredging and was also considered to be a conservative representation of pore water associated with the material to be dredged. The porewater samples were analyzed for BTEX, arsenic, cadmium, copper, lead and mercury and dissolved organic carbon.

SAMPLING RESULTS

The results of the sediment sampling within the proposed project area were compared to the NYSDEC Technical and Operational Guidance Series (TOGS) 5.1.9 In-Water and Riparian Management of Sediment and Dredged Material threshold values for sediment. NYSDEC TOGS presents threshold values for metals (arsenic, cadmium, copper, lead and mercury), total PAHs, petroleum-related compounds (benzene and total BTEX), pesticides (DDT, DDD, DDE, chlordane, dieldrin) and total PCBs. The NYSDEC identifies three classes of sediment quality thresholds, Class A, B and C. Class A is identified as sediments that have no appreciable contamination and would not be toxic to aquatic life. If sediment chemistry is found to be at or below the chemical concentrations that define this class, then dredging and in-water riparian placement can generally proceed at approved locations. Class B materials are identified as those which have moderate contamination and may exhibit chronic toxicity to aquatic life. Dredging and riparian placement may be conducted with several restrictions. Class C is identified as materials that have high levels of contamination and are expected to be potentially acutely toxic to aquatic life. Dredging and disposal requirements for this latter class of material may therefore be more stringent.

Tables F-1 and F-2 present the concentrations of the NYSDEC TOGS parameters and identifies the sediment classification based upon NYSDEC TOGS 5.1.9 guidance for the sediment to be dredged and the sediment to be exposed after dredging, respectively. **Tables F-1 and F-2** also present the sampling results for TOC. Sediment quality within the materials to be dredged and the materials to be exposed after dredging were largely the same classifications. Comparison of the data with TOGS 5.1.9 guidance indicated that the concentrations of total PCBs, dieldrin, sum of DDT+DDD+DDE, total PAHs, benzene and total BTEX concentrations were generally classified as Class A in both the material to be dredged and the material to be exposed after dredging. Cadmium, chlordane and mirex concentrations were generally classified as Class B in both the material to be dredged and the material to be exposed after dredging. Copper, lead and mercury concentrations in both the materials to be dredged and material to be exposed after dredging were generally classified as Class C. The arsenic concentrations were classified as Class A in the material to be dredged and Class B in the material to be exposed, although the Class B arsenic concentrations in the materials to be exposed were on the low end of the Class B threshold range.

Tables F-3 and F-4 present a summary of the sediment sampling results for the sediment to be dredged and the sediment to be exposed after dredging, respectively. The concentration range, sediment class, average concentration and the NYSDEC TOGS sediment classification are presented for each of the TOGS parameters sampled. For the material to be dredged, arsenic, total PCBs, dieldrin, sum of DDT+DDD+DDE, total PAH, benzene, and BTEX were classified as Class A, cadmium, chlordane, and mirex were classified as Class B and copper, lead, and mercury were classified as Class C based on average concentrations. For the material to be exposed after dredging, the total PCBs, dieldrin, sum of DDT+DDD+DDE, total PAH, benzene and BTEX were classified as Class A, arsenic, cadmium, chlordane and mirex were classified as Class B and copper, lead, and mercury were classified as Class C based on average concentrations.

Table F-1
Sampling Results for Sediments to be Dredged
Flushing Bay

Sample Location	TOGS Class A	TOGS Class B	TOGS Class C	CS-1 (0-5.5)	CS-2 (0-4.5)	CS-3 (0-3.5)	CS-3 (0-4.5)	CS-3 (0-5.5)	CS-4 (0-3.5)	CS-4 (0-4.5)	CS-4 (0-5.5)	CS-5 (0-3.5)	CS-5 (0-4.5)	CS-5 (0-5.5)	CS-7 (0-1.5)	CS-7 (0-2.5)	CS-7 (0-3.5)	CS-8 (0-5.5)	CS-9 (0-1.5)	CS-9 (0-2.5)
Project Depth				**5.5**	**5.5**	**5.5**	**6.5**	**7.5**	**5.5**	**6.5**	**7.5**	**5.5**	**6.5**	**7.5**	**5.5**	**6.5**	**7.5**	**5.5**	**5.5**	**6.5**
Date Sampled				**5/1/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/2/2012**	**5/1/2012**	**5/2/2012**	**5/2/2012**
Compound	**mg/kg**			**mg/kg**																
Metals																				
Arsenic	< 8.2	8.2 - 53	> 53	7.88	12.6	4.33	6.95	8.22	7.64	9.01	8.96	4.35	10.3	7.37	9.75	9.11	8.63	7.18	8.79	8.3
Cadmium	< 1.2	1.2 -9.5	> 9.5	0.191 J	7.26	1.38	4.01	3.02	4.22	4.26	5.98	4	5.66	6.87	3.13	4.32	5.09	0.304	3.45	3.56
Copper	< 33	33 - 270	> 270	13.5	501	203	299	255	332	365	513	323	506	523	307	372	337	28.7	323	324
Lead	< 47	47 - 218	> 218	15.2 N	562 N	223 N	425 N	349 N	424	509	618	344	652 N	898 N	261	318	293	38.6 N	263	274
Mercury	< 0.17	0.17 - 1.0	> 1.0	0.061 N	3.2 *D	1.06 *D	1.48 *D	1.63 *D	3.01 D	4.35 D	5.51 D	1.89 D	10.2 *D	2.64 *D	4.45 D	2.02 D	2.45 D	0.154 N	1.83	2.05 D
PCB																				
Aroclor-1016	-	-	-	0.0065 U	0.012 U	0.0061 U	0.0072 U	0.0069 U	0.011 U	0.0099 U	0.011 U	0.01 U	0.01 U	0.01 U	0.014 U	0.013 U	0.013 U	0.0045 U	0.014 U	0.013 U
Aroclor-1221	-	-	-	0.0064 U	0.011 U	0.006 U	0.0071 U	0.0068 U	0.011 U	0.0097 U	0.011 U	0.01 U	0.01 U	0.01 U	0.014 U	0.013 U	0.013 U	0.0044 U	0.014 U	0.013 U
Aroclor-1232	-	-	-	0.014 U	0.025 U	0.013 U	0.016 U	0.015 U	0.024 U	0.021 U	0.024 U	0.023 U	0.023 U	0.022 U	0.03 U	0.028 U	0.028 U	0.0097 U	0.03 U	0.028 U
Aroclor-1242	-	-	-	0.0064 U	0.011 U	0.006 U	0.0071 U	0.0068 U	0.011 U	0.0097 U	0.011 U	0.01 U	0.01 U	0.01 U	0.014 U	0.013 U	0.013 U	0.0044 U	0.014 U	0.013 U
Aroclor-1248	-	-	-	0.012 U	0.022 U	0.012 U	0.014 U	0.013 U	0.021 U	0.019 U	0.021 U	0.02 U	0.02 U	0.019 U	0.026 U	0.024 U	0.024 U	0.0086 U	0.026 U	0.024 U
Aroclor-1254	-	-	-	0.0028 U	0.005 U	0.0026 U	0.0031 U	0.003 U	0.0048 U	0.0042 U	0.0048 U	0.0045 U	0.0045 U	0.0044 U	0.0059 U	0.0055 U	0.0055 U	0.0019 U	0.0059 U	0.0055 U
Aroclor-1260	-	-	-	0.0077 U	0.014 U	0.0072 U	0.024 J	0.028 J	0.013 U	0.012 U	0.013 U	0.012 U	0.0047 J	0.0415 J	0.016 U	0.015 U	0.015 U	0.0053 U	0.016 U	0.015 U
TOTAL PCB (sum of Aroclors)	< 0.1	0.1 - 1	> 1	0.0558	0.1	0.0529	0.0785	0.0795	0.10	0.0855	0.0958	0.0895	0.1245	0.1169	0.1199	0.1115	0.1115	0.0388	0.1199	0.1115
Pesticides																				
Dieldrin	< 0.11	0.11 - 0.48	> 0.48	0.00024 U	0.00043 U	0.00023 U	0.00027 U	0.00026 U	0.00042 U	0.00037 U	0.00042 U	0.00039 U	0.00039 U	0.00038 U	0.00051 U	0.00049 U	0.00048 U	0.00017 U	0.00051 U	0.00048 U
4,4-DDD	-	-	-	0.00032 U	0.00056 U	0.0003 U	0.00036 U	0.00034 U	0.00055 U	0.00048 U	0.00055 U	0.00051 U	0.00051 U	0.00049 U	0.00067 U	0.00064 U	0.00062 U	0.00022 U	0.00066 U	0.00062 U
4,4-DDE	-	-	-	0.00038 U	0.00066 U	0.00035 U	0.00042 U	0.0004 U	0.00065 U	0.00057 U	0.00065 U	0.0006 U	0.0006 U	0.00058 U	0.00079 U	0.00075 U	0.00073 U	0.00026 U	0.00078 U	0.00072 U
4,4-DDT	-	-	-	0.00026 U	0.00046 U	0.00025 U	0.00029 U	0.00028 U	0.00045 U	0.0004 U	0.00045 U	0.00042 U	0.00042 U	0.00041 U	0.00055 U	0.00052 U	0.00051 U	0.00018 U	0.00055 U	0.00051 U
SUM OF DDT+DDD+DDE	< 0.003	0.003 - 0.03	> 0.03	0.00096	0.00168	0.0009	0.00107	0.00102	0.00165	0.00145	0.00165	0.00153	0.00153	0.00148	0.00201	0.00191	0.00186	0.00066	0.00199	0.00186
CHLORDANE	< 0.003	0.003 - 0.036	> 0.036	0.0064 U	0.011 U	0.006 U	0.0071 U	0.0068 U	0.011 U	0.0096 U	0.011 U	0.01 U	0.01 U	0.0098 U	0.013 U	0.013 U	0.012 U	0.0044 U	0.013 U	0.012 U
MIREX	< 0.0014	0.0014 - 0.014	> 0.014	0.0012 U	0.0022 U	0.0012 U	0.0014 U	0.0013 U	0.0021 U	0.0019 U	0.0021 U	0.002 U	0.002 U	0.0019 U	0.0026 U	0.0025 U	0.0024 U	0.00085 U	0.0026 U	0.0024 U
SVOC																				
2-Chloronaphthalene	-	-	-	0.014 U	0.025 U	0.013 U	0.016 U	0.015 U	0.024 U	0.022 U	0.024 U	0.023 U	0.023 U	0.022 U	0.03 U	0.028 U	0.028 U	0.0097 U	0.029 U	0.028 U
2-Methylnaphthalene	-	-	-	0.016 U	0.028 U	0.015 U	0.017 U	0.017 U	0.027 U	0.024 U	0.027 U	0.025 U	0.025 U	0.024 U	0.034 U	0.031 U	0.031 U	0.011 U	0.032 U	0.031 U
Acenaphthene	-	-	-	0.018 U	0.031 U	0.016 U	0.02 U	0.019 U	0.03 U	0.027 U	0.03 U	0.028 U	0.028 U	0.027 U	0.038 U	0.035 U	0.035 U	0.012 U	0.036 U	0.035 U
Acenaphthylene	-	-	-	0.016 U	0.028 U	0.015 U	0.017 U	0.017 U	0.027 U	0.024 U	0.027 U	0.025 U	0.025 U	0.024 U	0.034 U	0.031 U	0.031 U	0.011 U	0.032 U	0.031 U
Anthracene	-	-	-	0.013 U	0.023 U	0.012 U	0.014 U	0.014 U	0.022 U	0.019 U	0.022 U	0.021 U	0.021 U	0.019 U	0.027 U	0.025 U	0.025 U	0.0087 U	0.026 U	0.025 U
Benzo(a)anthracene	-	-	-	0.03 U	0.053 U	0.028 U	0.033 U	0.032 U	0.051 U	0.045 U	0.051 U	0.048 U	0.048 U	0.045 U	0.063 U	0.059 U	0.059 U	0.02 U	0.061 U	0.059 U
Benzo(a)pyrene	-	-	-	0.014 U	0.024 U	0.013 U	0.015 U	0.014 U	0.023 U	0.021 U	0.023 U	0.022 U	0.022 U	0.02 U	0.029 U	0.027 U	0.027 U	0.0092 U	0.028 U	0.027 U
Benzo(b)fluoranthene	-	-	-	0.021 U	0.036 U	0.019 U	0.023 U	0.022 U	0.035 U	0.031 U	0.035 U	0.033 U	0.033 U	0.031 U	0.044 U	0.04 U	0.04 U	0.014 U	0.042 U	0.04 U
Benzo(g,h,i)perylene	-	-	-	0.025 U	0.045 U	0.024 U	0.028 U	0.027 U	0.043 U	0.038 U	0.043 U	0.041 U	0.041 U	0.038 U	0.054 U	0.05 U	0.05 U	0.017 U	0.052 U	0.05 U
Benzo(k)fluoranthene	-	-	-	0.03 U	0.052 U	0.027 U	0.033 U	0.031 U	0.051 U	0.045 U	0.05 U	0.047 U	0.047 U	0.045 U	0.063 U	0.058 U	0.058 U	0.02 U	0.06 U	0.058 U
Chrysene	-	-	-	0.028 U	0.05 U	0.026 U	0.031 U	0.03 U	0.049 U	0.043 U	0.049 U	0.046 U	0.046 U	0.043 U	0.06 U	0.056 U	0.056 U	0.019 U	0.058 U	0.056 U
Dibenz(a,h)anthracene	-	-	-	0.018 U	0.032 U	0.017 U	0.02 U	0.019 U	0.031 U	0.027 U	0.031 U	0.029 U	0.029 U	0.027 U	0.038 U	0.035 U	0.035 U	0.012 U	0.037 U	0.035 U
Fluoranthene	-	-	-	0.013 U	0.022 U	0.012 U	0.014 U	0.013 U	0.022 U	0.019 U	0.022 U	0.02 U	0.02 U	0.019 U	0.027 U	0.025 U	0.025 U	0.0086 U	0.026 U	0.025 U
Fluorene	-	-	-	0.024 U	0.042 U	0.022 U	0.026 U	0.025 U	0.041 U	0.036 U	0.04 U	0.038 U	0.038 U	0.036 U	0.05 U	0.047 U	0.047 U	0.016 U	0.048 U	0.046 U
Indeno(1,2,3-cd)pyrene	-	-	-	0.021 U	0.037 U	0.019 U	0.023 U	0.022 U	0.036 U	0.032 U	0.036 U	0.034 U	0.034 U	0.032 U	0.044 U	0.041 U	0.041 U	0.014 U	0.043 U	0.041 U
Naphthalene	-	-	-	0.022 U	0.038 U	0.02 U	0.024 U	0.023 U	0.037 U	0.033 U	0.037 U	0.035 U	0.035 U	0.033 U	0.046 U	0.042 U	0.042 U	0.015 U	0.044 U	0.042 U
Phenanthrene	-	-	-	0.017 U	0.03 U	0.016 U	0.019 U	0.018 U	0.029 U	0.026 U	0.029 U	0.027 U	0.027 U	0.026 U	0.036 U	0.033 U	0.033 U	0.012 U	0.035 U	0.033 U
Pyrene	-	-	-	0.015 U	0.027 U	0.014 U	0.017 U	0.016 U	0.026 U	0.023 U	0.026 U	0.024 U	0.024 U	0.023 U	0.032 U	0.03 U	0.03 U	0.01 U	0.031 U	0.03 U
TOTAL PAH	< 4	4 - 45	> 45	0.355	0.623	0.328	0.39	0.374	0.604	0.535	0.602	0.566	0.566	0.534	0.749	0.693	0.693	0.2392	0.72	0.692
Chrysene																				
Volatile Organic Compounds (VOC)																				
Benzene	< 0.59	0.59 - 2.16	> 2.16	0.00071 U	0.0031	0.00585 JQ	0.00655 JQ	0.005 JQ	0.00735 J	0.00235 J	0.0037 J	0.0175	0.0086 J	0.00885 JQ	0.0015 U	0.0014 U	0.0014 U	0.00048 U	0.0015 U	0.0014 U
Ethyl Benzene	-	-	-	0.0012 U	0.00815 J	0.00835	0.0245	0.013	0.053	0.033	0.027	0.0275	0.038	0.064	0.0025 U	0.0023 U	0.0023 U	0.00079 U	0.0024 U	0.0023 U
m/p-Xylenes	-	-	-	0.0014 U	0.00815 J	0.0113 J	0.044	0.0115 J	0.0435	0.015 J	0.013 J	0.0205 J	0.045	0.0915	0.0029 U	0.0027 U	0.0026 U	0.00092 U	0.0028 U	0.0027 U
o-Xylene	-	-	-	0.0013 U	0.0077 J	0.00905	0.032	0.00825 J	0.0191	0.01205	0.011 J	0.02	0.03	0.055	0.0027 U	0.0025 U	0.0025 U	0.00086 U	0.0026 U	0.0025 U
Toluene	-	-	-	0.0012 U	0.0077 J	0.0065 J	0.00815 J	0.00485 J	0.0145 J	0.01035 J	0.0053 J	0.0195	0.01265	0.0195	0.004 J	0.00345 J	0.00235 U	0.0014 J	0.0025 U	0.0024 U
BTEX	< 0.96	0.96 - 5.9	> 5.9	0.00581	0.0345	0.04105	0.1152	0.0392	0.13745	0.07275	0.06	0.105	0.13425	0.23885	0.0129	0.01235	0.01115	0.00445	0.0118	0.0113
Total Organic Carbon (TOC)	-	-	-	390,000	630,000	210,000	310,000	280,000	490,000	400,000	420,000	450,000	450,000	580,000	470,000	490,000	510,000	220,000	510,000	480,000

Table F-1 (cont'd)
Sampling Results for Sediments to be Dredged
Flushing Bay

Sample Location	TOGS Class A	TOGS Class B	TOGS Class C	CS-9 (0-3.5)	CS-10 (0-4.5)	CS-11 (0-3.5)	CS-12 (0-3.5)	CS-13 (0-4.5)	CS-14 (0-6.5)	CS-15 (0-4.5)	CS-16 (0-5.5)	CS-17 (0-4.5)	CS-18 (0-4.5)	CS-19 (0-5.5)	CS-20 (0-4.5)
Project Depth				7.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Date Sampled				5/2/2012	5/1/2012	5/1/2012	5/1/2012	4/30/2012	5/1/2012	5/1/2012	5/1/2012	4/30/2012	4/30/2012	5/1/2012	5/1/2012
Compound	mg/kg			mg/kg											
Metals															
Arsenic	< 8.2	8.2 - 53	> 53	9.69	5.35	10.2	9.64	9.65	9.57	7.27	6.06	9.8	7.46	6.81	9.84
Cadmium	< 1.2	1.2 -9.5	> 9.5	4.3	0.153	7.12	3.78	5.12	7.36	3.43	4.06	4.72	3.16	3.55	4.83
Copper	< 33	33 - 270	> 270	378	18.4	532	355	434	558	325	390	407	249	332	348
Lead	< 47	47 - 218	> 218	317	24.5 N	497 N	319 N	394	767 N	363 N	381 N	377	261	309 N	318 N
Mercury	< 0.17	0.17 - 1.0	> 1.0	2.23 D	0.108 N	2.29 ND	1.9 ND	1.92	4.49 ND	1.91 ND	2.17 ND	3.77	1.84	2.11 ND	1.99 ND
PCB															
Aroclor-1016	-	-	-	0.013 U	0.0043 U	0.011 U	0.011 U	0.0094 U	0.0096 U	0.0089 U	0.0072 U	0.0091 U	0.0091 U	0.0083 U	0.0089 U
Aroclor-1221	-	-	-	0.013 U	0.0042 U	0.011 U	0.011 U	0.0092 U	0.0094 U	0.0087 U	0.0071 U	0.0089 U	0.0089 U	0.0081 U	0.0087 U
Aroclor-1232	-	-	-	0.029 U	0.0093 U	0.024 U	0.024 U	0.02 U	0.021 U	0.019 U	0.016 U	0.02 U	0.02 U	0.018 U	0.019 U
Aroclor-1242	-	-	-	0.013 U	0.0042 U	0.011 U	0.011 U	0.0092 U	0.0094 U	0.0087 U	0.0071 U	0.0089 U	0.0089 U	0.0081 U	0.0087 U
Aroclor-1248	-	-	-	0.025 U	0.0082 U	0.021 U	0.021 U	0.018 U	0.018 U	0.017 U	0.014 U	0.017 U	0.017 U	0.016 U	0.017 U
Aroclor-1254	-	-	-	0.0057 U	0.0019 U	0.0048 U	0.0048 U	0.004 U	0.0041 U	0.0038 U	0.0031 U	0.0039 U	0.0039 U	0.0035 U	0.038 U
Aroclor-1260	-	-	-	0.016 U	0.0051 U	0.013 U	0.013 U	0.011 U	0.011 U	0.011 U	0.130 U	0.011 U	0.011 U	0.0098 U	0.011 U
TOTAL PCB (sum of Aroclors)	< 0.1	0.1 - 1	> 1	0.1147	0.0372	0.0958	0.0958	0.0808	0.0825	0.0771	0.1845	0.0788	0.0788	0.0718	0.0771
Pesticides															
Dieldrin	< 0.11	0.11 - 0.48	> 0.48	0.00049 U	0.00016 U	0.00042 U	0.00042 U	0.00035	0.00036 U	0.00033 U	0.00027 U	0.00034	0.00034	0.00031 U	0.00033 U
4,4-DDD	-	-	-	0.00064 U	0.00021 U	0.00055 U	0.00055 U	0.00046 U	0.0078 P	0.00044 U	0.00035 U	0.00045 U	0.00045 U	0.00041 U	0.00044 U
4,4-DDE	-	-	-	0.00076 U	0.00025 U	0.00065 U	0.00064 U	0.00054 U	0.00056 U	0.00051 U	0.00042 U	0.00053 U	0.00053 U	0.00048 U	0.00051 U
4,4-DDT	-	-	-	0.00053 U	0.00017 U	0.00045 U	0.00045 U	0.00037 U	0.00039 U	0.00036 U	0.00029 U	0.00037 U	0.00037 U	0.00034 U	0.00036 U
SUM OF DDT+DDD+DDE	< 0.003	0.003 - 0.03	> 0.03	0.00193	0.00063	0.00165	0.00164	0.00137	0.00875	0.00131	0.00106	0.00135	0.00135	0.00123	0.00131
CHLORDANE	< 0.003	0.003 - 0.036	> 0.036	0.013 U	0.0042 U	0.011 U	0.011 U	0.0091	0.0095 U	0.0087 U	0.0071 U	0.0089	0.009	0.0081 U	0.0087 U
MIREX	< 0.0014	0.0014 - 0.014	> 0.014	0.0025 U	0.00082 U	0.0021 U	0.0021 U	0.0018	0.0018 U	0.0017 U	0.0014 U	0.0017	0.0017	0.0016 U	0.0017 U
SVOC															
2-Chloronaphthalene	-	-	-	0.029 U	0.0095 U	0.024 U	0.024 U	0.02 U	0.021 U	0.019 U	0.016 U	0.02 U	0.02 U	0.018 U	0.019 U
2-Methylnaphthalene	-	-	-	0.032 U	0.01 U	0.027 U	0.027 U	0.023 U	0.023 U	0.021 U	0.42 J	0.022 U	0.022 U	0.02 U	0.021 U
Acenaphthene	-	-	-	0.036 U	0.012 U	0.03 U	0.03 U	0.025 U	0.026 U	0.024 U	0.02 U	0.025 U	0.025 U	0.022 U	0.024 U
Acenaphthylene	-	-	-	0.032 U	0.01 U	0.027 U	0.027 U	0.023 U	0.023 U	0.021 U	0.017 U	0.022 U	0.022 U	0.02 U	0.021 U
Anthracene	-	-	-	0.026 U	0.0085 U	0.022 U	0.022 U	0.018 U	0.019 U	0.017 U	0.014 U	0.018 U	0.018 U	0.016 U	0.017 U
Benzo(a)anthracene	-	-	-	0.061 U	0.02 U	0.051 U	0.051 U	0.043 U	0.044 U	0.041 U	0.033 U	0.042 U	0.042 U	0.038 U	0.041 U
Benzo(a)pyrene	-	-	-	0.028 U	0.009 U	0.023 U	0.023 U	0.019 U	0.02 U	0.018 U	0.015 U	0.019 U	0.019 U	0.017 U	0.018 U
Benzo(b)fluoranthene	-	-	-	0.042 U	0.014 U	0.035 U	0.035 U	0.029 U	0.03 U	0.028 U	0.35 J	0.029 U	0.029 U	0.026 U	0.028 U
Benzo(g,h,i)perylene	-	-	-	0.052 U	0.017 U	0.043 U	0.043 U	0.036 U	0.037 U	0.034 U	0.028 U	0.035 U	0.035 U	0.032 U	0.035 U
Benzo(k)fluoranthene	-	-	-	0.06 U	0.02 U	0.051 U	0.051 U	0.042 U	0.044 U	0.04 U	0.033 U	0.041 U	0.041 U	0.037 U	0.04 U
Chrysene	-	-	-	0.058 U	0.019 U	0.049 U	0.049 U	0.041 U	0.042 U	0.039 U	0.31 J	0.04 U	0.04 U	0.036 U	0.039 U
Dibenz(a,h)anthracene	-	-	-	0.037 U	0.012 U	0.031 U	0.031 U	0.026 U	0.027 U	0.025 U	0.02 U	0.025 U	0.025 U	0.023 U	0.025 U
Fluoranthene	-	-	-	0.026 U	0.0084 U	0.022 U	0.022 U	0.018 U	0.019 U	0.017 U	0.57 J	0.018 U	0.018 U	0.016 U	0.017 U
Fluorene	-	-	-	0.048 U	0.016 U	0.041 U	0.041 U	0.034 U	0.035 U	0.032 U	0.026 U	0.033 U	0.033 U	0.03 U	0.032 U
Indeno(1,2,3-cd)pyrene	-	-	-	0.043 U	0.014 U	0.036 U	0.036 U	0.030 U	0.031 U	0.028 U	0.023 U	0.029 U	0.029 U	0.026 U	0.028 U
Naphthalene	-	-	-	0.044 U	0.014 U	0.037 U	0.037 U	0.031 U	0.032 U	0.029 U	0.024 U	0.03 U	0.03 U	0.027 U	0.029 U
Phenanthrene	-	-	-	0.035 U	0.011 U	0.029 U	0.029 U	0.024 U	0.025 U	0.023 U	0.33 J	0.24 U	0.024 U	0.021 U	0.023 U
Pyrene	-	-	-	0.031 U	0.01 U	0.026 U	0.026 U	0.022 U	0.022 U	0.02 U	0.5 J	0.021 U	0.021 U	0.019 U	0.02 U
TOTAL PAH	< 4	4 - 45	> 45	0.72	0.2344	0.604	0.604	0.504	0.52	0.476	2.749	0.493	0.493	0.444	0.477
Chrysene															
Volatile Organic Compounds (VOC)															
Benzene	< 0.59	0.59 - 2.16	> 2.16	0.0015 U	0.00047 U	0.00375 J	0.0012 U	0.001 U	0.00705 J	0.00475 J	0.00079 U	0.0032 J	0.001	0.0009 U	0.00097 U
Ethyl Benzene	-	-	-	0.0024 U	0.00077 U	0.0057 J	0.0046 J	0.0017 U	0.0195	0.0175	0.0118	0.00835 J	0.0016 U	0.0061 J	0.0016 U
m/p-Xylenes	-	-	-	0.0028 U	0.00089 U	0.00835 J	0.0058 J	0.0019 U	0.0435	0.023 J	0.0185	0.0087 J	0.0019 U	0.004 J	0.0018 U
o-Xylene	-	-	-	0.0026 U	0.00084 U	0.0109 J	0.0068 J	0.0018 U	0.038	0.021	0.0118	0.0092 J	0.0018 U	0.0034 J	0.0017 U
Toluene	-	-	-	0.0025 U	0.0008 U	0.00945 J	0.0073 J	0.0017 U	0.0097 J	0.00925 J	0.000975 J	0.0017 U	0.0017 U	0.0015 U	0.0016 U
BTEX	< 0.96	0.96 - 5.9	> 5.9	0.0126	0.00377	0.03815	0.0257	0.0081	0.11775	0.0755	0.05264	0.03115	0.008	0.0159	0.00767
Total Organic Carbon (TOC)	-	-	-	530,000	190,000	550,000	450,000	560,000	560,000	330,000	380,000	820,000	500,000	600,000	690,000

Notes:
(1) U - not detected
(2) J - estimated value
(3) D – dilution
(4) N - presumptive evidence of a compound
(5) * - for dual column analysis, the lowest quantitated concentration is reported due to coeluting interference.
(6) Method detection limit (MDL) used for non-detected concentrations as referenced in NYSDEC TOGS 5.1.9.
(7) Total reported values for BTEX, Total PCB, Total PAH and pesticides reflect the sum of detects and MDL for non detects.

Table F-2
Sampling Results for Sediments to be Exposed After Dredging
Flushing Bay

Sample Location	TOGS Class A	TOGS Class B	TOGS Class C	CS-1 (5.5-6.5)	CS-2 (4.5-5.5)	CS-3 (3.5-4.5)	CS-3 (4.5-5.5)	CS-3 (5.5-6.5)	CS-4 (3.5-4.5)	CS-4 (4.5-5.5)	CS-4 (5.5-6.5)	CS-5 (3.5-4.5)	CS-5 (4.5-5.5)	CS-5 (5.5-6.5)	CS-7 (1.5-2.5)	CS-7 (2.5-3.5)	CS-7 (3.5-4.5)	CS-8 (5.5-6.5)	CS-9 (1.5-2.5)	CS-9 (2.5-3.5)
Project Depth				5.5	5.5	5.5	6.5	7.5	5.5	6.5	7.5	5.5	6.5	7.5	5.5	6.5	7.5	5.5	5.5	6.5
Date Sampled				5/1/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/1/2012	5/2/2012	5/2/2012
Compound	**mg/kg**			**mg/kg**																
Metals																				
Arsenic	< 8.2	8.2 - 53	> 53	10.4	19	6.89	8.46	15.4	10.3	16.1	14.1	3.97	10.1	13.7	10.2	11.4	8.53	8.24	12.5	10.3
Cadmium	< 1.2	1.2 -9.5	> 9.5	0.282	13.3	3.58	7.07	12.2	9.57	9.31	7.5	4.32	9.11	10.3	5.65	9.5	7.17	0.201	5.91	7.01
Copper	< 33	33 - 270	> 270	13.4	634	245	527	638	617	523	454	333	564	656	418	581	489	10.3	460	658
Lead	< 47	47 - 218	> 218	15.1 N	845 N	1540 N	943 N	1040 N	1100	769	644	546	1130 N	1430 N	368	701	453	12.4 N	405	498
Mercury	< 0.17	0.17 - 1.0	> 1.0	0.016 JN	4.51 *D	2.44 *D	4.92 *D	4.95 *D	4.2 D	3.06 D	3.03 D	4.21 D	3.3 *D	4.03 *D	2.22 D	3 D	2.74 D	0.014 JN	2.53 D	3.19 D
PCB																				
Aroclor-1016	-	-	-	0.0063 U	0.01 U	0.0067 U	0.008 U	0.0089 U	0.0094 U	0.0084 U	0.0079 U	0.0085 U	0.01 U	0.0096 U	0.012 U	0.012 U	0.012 U	0.0054 U	0.012 U	0.012 U
Aroclor-1221	-	-	-	0.0062 U	0.01 U	0.0065 U	0.0079 U	0.0087 U	0.0092 U	0.0083 U	0.0077 U	0.0083 U	0.01 U	0.0094 U	0.012 U	0.012 U	0.012 U	0.0053 U	0.012 U	0.012 U
Aroclor-1232	-	-	-	0.014 U	0.023 U	0.014 U	0.014 U	0.019 U	0.02 U	0.018 U	0.017 U	0.018 U	0.023 U	0.021 U	0.026 U	0.027 U	0.026 U	0.012 U	0.027 U	0.027 U
Aroclor-1242	-	-	-	0.0062 U	0.01 U	0.0065 U	0.0079 U	0.0087 U	0.0092 U	0.0083 U	0.0077 U	0.0083 U	0.01 U	0.0094 U	0.012 U	0.012 U	0.012 U	0.0053 U	0.012 U	0.012 U
Aroclor-1248	-	-	-	0.012 U	0.02 U	0.013 U	0.015 U	0.017 U	0.018 U	0.016 U	0.015 U	0.016 U	0.02 U	0.018 U	0.023 U	0.023 U	0.023 U	0.01 U	0.024 U	0.024 U
Aroclor-1254	-	-	-	0.0027 U	0.0045 U	0.0029 U	0.0035 U	0.0038 U	0.004 U	0.0036 U	0.0034 U	0.0036 U	0.0045 U	0.0041 U	0.0051 U	0.0053 U	0.0051 U	0.0023 U	0.0053 U	0.0053 U
Aroclor-1260	-	-	-	0.0075 U	0.012 U	0.024 U	0.16	0.011 U	0.011 U	0.01 U	0.0093 U	0.046 U	0.077	0.011 U	0.014 U	0.015 U	0.014 U	0.0064 U	0.015 U	0.015 U
TOTAL PCB (sum of Aroclors)	< 0.1	0.1 - 1	> 1	0.0549	0.0895	0.0736	0.2193	0.0771	0.0808	0.0726	0.068	0.1087	0.1545	0.0825	0.1041	0.1063	0.1041	0.0467	0.1073	0.1073
Pesticides																				
Dieldrin	< 0.11	0.11 - 0.48	> 0.48	0.00024 U	0.00039 U	0.00025 U	0.0003 U	0.00033 U	0.00035 U	0.00032 U	0.00029 U	0.00032 U	0.00039 U	0.00036 U	0.00045 U	0.00046 U	0.00045 U	0.0002 U	0.00046 U	0.00047 U
4,4-DDE	-	-	-	0.00031 U	0.00051 U	0.00033 U	0.0004 U	0.00043 U	0.004 JP	0.01015 P	0.012 P	0.00042 U	0.00051 U	0.00047 U	0.00059 U	0.0006 U	0.00059 U	0.00027 U	0.0006 U	0.00061 U
4,4-DDD	-	-	-	0.00036 U	0.0006 U	0.00038 U	0.00047 U	0.00051 U	0.00054 U	0.00049 U	0.00045 U	0.00049 U	0.0006 U	0.00055 U	0.0007 U	0.00071 U	0.00069 U	0.00031 U	0.00071 U	0.00072 U
4,4-DDT	-	-	-	0.00025 U	0.00042 U	0.00027 U	0.00033 U	0.00036 U	0.00038 U	0.00405	0.00565 P	0.00034 U	0.00042 U	0.00039 U	0.00049 U	0.0005 U	0.00048 U	0.00022 U	0.0005 U	0.0005 U
SUM OF DDT+DDD+DDE	< 0.003	0.003 - 0.03	> 0.03	0.00092	0.00153	0.00098	0.0012	0.0013	0.00492	0.01469	0.0181	0.00125	0.00153	0.00141	0.00178	0.00181	0.00176	0.0008	0.00181	0.00183
CHLORDANE	< 0.003	0.003 - 0.036	> 0.036	0.0062 U	0.01 U	0.0065 U	0.008 U	0.0087 U	0.0091 U	0.0083 U	0.0076 U	0.0083 U	0.01 U	0.0094 U	0.012 U	0.012 U	0.012 U	0.0053 U	0.012 U	0.012 U
MIREX	< 0.0014	0.0014 - 0.014	> 0.014	0.0012 U	0.002 U	0.0013 U	0.0015 U	0.0017 U	0.0018 U	0.0016 U	0.0015 U	0.0016 U	0.002 U	0.0018 U	0.0023 U	0.0023 U	0.0023 U	0.001 U	0.0023 U	0.0024 U
SVOC																				
2-Chloronaphthalene	-	-	-	0.014 U	0.023 U	0.015 U	0.018 U	0.019 U	0.02 U	0.019 U	0.017 U	0.018 U	0.023 U	0.021 U	0.026 U	0.027 U	0.062 U	0.012 U	0.027 U	0.027 U
2-Methylnaphthalene	-	-	-	0.015 U	0.025 U	0.016 U	0.02 U	0.021 U	0.023 U	0.02 U	0.019 U	0.02 U	0.025 U	0.023 U	0.029 U	0.03 U	0.029 U	0.013 U	0.03 U	0.03 U
Acenaphthene	-	-	-	0.017 U	0.028 U	0.018 U	0.022 U	0.024 U	0.025 U	0.023 U	0.021 U	0.023 U	0.028 U	0.026 U	0.032 U	0.034 U	0.032 U	0.015 U	0.034 U	0.033 U
Acenaphthylene	-	-	-	0.015 U	0.025 U	0.016 U	0.02 U	0.021 U	0.023 U	0.02 U	0.019 U	0.02 U	0.025 U	0.023 U	0.029 U	0.03 U	0.029 U	0.013 U	0.03 U	0.03 U
Anthracene	-	-	-	0.012 U	0.021 U	0.013 U	0.016 U	0.017 U	0.018 U	0.017 U	0.015 U	0.017 U	0.021 U	0.019 U	0.023 U	0.024 U	0.023 U	0.011 U	0.024 U	0.024 U
Benzo(a)anthracene	-	-	-	0.029 U	0.048 U	0.41 J	0.037 U	0.041 U	0.043 U	0.039 U	0.036 U	0.039 U	0.048 U	0.044 U	0.055 U	0.057 U	0.055 U	0.025 U	0.057 U	0.057 U
Benzo(a)pyrene	-	-	-	0.013 U	0.022 U	0.33 J	0.017 U	0.018 U	0.019 U	0.018 U	0.016 U	0.017 U	0.022 U	0.02 U	0.025 U	0.026 U	0.025 U	0.011 U	0.026 U	0.026 U
Benzo(b)fluoranthene	-	-	-	0.02 U	0.033 U	0.41 J	0.38 J	0.028 U	0.029 U	0.027 U	0.025 U	0.026 U	0.033 U	0.03 U	0.038 U	0.039 U	0.038 U	0.017 U	0.039 U	0.039 U
Benzo(g,h,i)perylene	-	-	-	0.024 U	0.041 U	0.026 U	0.031 U	0.035 U	0.036 U	0.033 U	0.031 U	0.033 U	0.041 U	0.037 U	0.047 U	0.048 U	0.046 U	0.021 U	0.048 U	0.048 U
Benzo(k)fluoranthene	-	-	-	0.028 U	0.047 U	0.03 U	0.036 U	0.04 U	0.042 U	0.038 U	0.036 U	0.038 U	0.047 U	0.044 U	0.054 U	0.056 U	0.054 U	0.025 U	0.056 U	0.056 U
Chrysene	-	-	-	0.027 U	0.046 U	0.38 J	0.36 J	0.039 U	0.041 U	0.037 U	0.034 U	0.037 U	0.046 U	0.042 U	0.052 U	0.054 U	0.052 U	0.024 U	0.054 U	0.054 U
Dibenz(a,h)anthracene	-	-	-	0.017 U	0.029 U	0.018 U	0.022 U	0.025 U	0.026 U	0.023 U	0.022 U	0.023 U	0.029 U	0.027 U	0.033 U	0.034 U	0.033 U	0.015 U	0.034 U	0.034 U
Fluoranthene	-	-	-	0.012 U	0.02 U	0.96	0.81	0.017 U	0.44 J	0.016 U	0.015 U	0.4 J	0.02 U	0.019 U	0.023 U	0.024 U	0.023 U	0.01 U	0.024 U	0.024 U
Fluorene	-	-	-	0.023 U	0.038 U	0.024 U	0.029 U	0.032 U	0.034 U	0.031 U	0.029 U	0.031 U	0.038 U	0.035 U	0.043 U	0.045 U	0.043 U	0.02 U	0.045 U	0.045 U
Indeno(1,2,3-cd)pyrene	-	-	-	0.02 U	0.034 U	0.021 U	0.026 U	0.028 U	0.03 U	0.027 U	0.025 U	0.027 U	0.034 U	0.031 U	0.038 U	0.04 U	0.038 U	0.017 U	0.04 U	0.04 U
Naphthalene	-	-	-	0.021U	0.035 U	0.022 U	0.027 U	0.029 U	0.031 U	0.028 U	0.026 U	0.028 U	0.035 U	0.032 U	0.04 U	0.041 U	0.04 U	0.018 U	0.041 U	0.041 U
Phenanthrene	-	-	-	0.016 U	0.027 U	0.74	0.63 J	0.023 U	0.024 U	0.022 U	0.02 U	0.34 J	0.027 U	0.025 U	0.031 U	0.032 U	0.031 U	0.014 U	0.032 U	0.032 U
Pyrene	-	-	-	0.015 U	0.024 U	0.75	0.7 J	0.02 U	0.022 U	0.019 U	0.018 U	0.33 J	0.024 U	0.022 U	0.028 U	0.029 U	0.028 U	0.012 U	0.029 U	0.029 U
TOTAL PAH	< 4	4 - 45	> 45	0.338	0.566	4.199	3.201	0.477	0.926	0.457	0.424	1.467	0.566	0.52	0.646	0.67	0.645	0.293	0.67	0.669
VOC																				
Benzene	< 0.59	0.59 - 2.16	> 2.16	0.00069 U	0.004 J	0.0036 JQ	0.0061 JQ	0.0062 JQ	0.0044 J	0.0054 J	0.00325 J	0.00845 J	0.0135 J	0.00995 JQ	0.0013 U	0.0074 J	0.00495 J	0.00059 U	0.00135 U	0.0135 J
Ethyl Benzene	-	-	-	0.0011 U	0.0019 U	0.0175	0.0245	0.0295	0.025	0.0105 J	0.0072 J	0.0375	0.09	0.0535	0.0021 U	0.00155 J	0.0088 J	0.00096 U	0.0145 J	0.00625 J
m/p-Xylenes	-	-	-	0.0013 U	0.0037 J	0.0205	0.036	0.0515	0.038	0.0135 J	0.0077 J	0.0375	0.125	0.0985	0.0025 U	0.0018 J	0.0093 J	0.0011 U	0.0053 J	0.0055 J
o-Xylene	-	-	-	0.0012 U	0.0055 J	0.0155	0.0535	0.041	0.0345	0.022	0.0155	0.0295	0.0815	0.0765	0.0023 U	0.0016 J	0.01025 J	0.001 U	0.0041 J	0.0046 J
Toluene	-	-	-	0.0012 U	0.0019 U	0.00675 J	0.00645 J	0.0057 J	0.00485 J	0.00485 J	0.0047 J	0.01245	0.0145	0.0068 J	0.0022 U	0.00495 J	0.00395 J	0.00099 U	0.0023 U	0.00295 J
BTEX	< 0.96	0.96 - 5.9	> 5.9	0.00549	0.0132	0.06385	0.12655	0.1339	0.10675	0.05625	0.03835	0.1224	0.3245	0.24525	0.0104	0.06185	0.03725	0.00464	0.02755	0.0328
Total Organic Carbon (TOC)	-	-	-	270,000	390,000	340,000	490,000	330,000	540,000	340,000	380,000	290,000	450,000	530,000	840,000	430,000	550,000	220,000	460,000	610,000

Table F-2 (cont'd)
Sampling Results for Sediments to be Exposed After Dredging
Flushing Bay

Sample Location	TOGS Class A	TOGS Class B	TOGS Class C	CS-9 (3.5-4.5)	CS-10 (4.5-5.5)	CS-11 (3.5-4.5)	CS-12 (3.5-4.5)	CS-13 (4.5-5.5)	CS-14 (6.5-7.5)	CS-15 (4.5-5.5)	CS-16 (5.5-6.5)	CS-17 (4.5-5.5)	CS-18 (4.5-5.5)	CS-19 (5.5-6.5)	CS-20 (4.5-5.5)
Project Depth				7.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Date Sampled				5/2/2012	5/1/2012	5/1/2012	5/1/2012	4/30/2012	5/1/2012	5/1/2012	5/1/2012	4/30/2012	4/30/2012	5/1/2012	5/1/2012
Compound	**mg/kg**			**mg/kg**											
Metals															
Arsenic	< 8.2	8.2 - 53	> 53	11.4	8.14	10.9	10.1	11.2	8.04	8.75	6.04	11.7	11.5	9.34	14.8
Cadmium	< 1.2	1.2 -9.5	> 9.5	9.61	0.335	8.59	7.86	6.59	0.838	7.7	7.82	7.89	6.05	6.53	6.04
Copper	< 33	33 - 270	> 270	576	32.1	572	641	502	66.4	519	505	519	465	516	287
Lead	< 47	47 - 218	> 218	686	45.7 N	618 N	600 N	515	95.1 N	620 N	1230 N	582	432	501 N	338 N
Mercury	< 0.17	0.17 - 1.0	> 1.0	3 D	0.396 N	3.24 ND	4.21 ND	3.14	0.546 N	2.86 ND	2.91 ND	3.75	2.69	3.25 ND	3.07 ND
PCB															
Aroclor-1016	-	-	-	0.011 U	0.0051 U	0.011 U	0.01 U	0.0091 U	0.0057 U	0.0089 U	0.0074 U	0.0094 U	0.0089 U	0.0094 U	0.0071 U
Aroclor-1221	-	-	-	0.011 U	0.005 U	0.011 U	0.01 U	0.0089 U	0.0056 U	0.0087 U	0.0072 U	0.0092 U	0.0087 U	0.0092 U	0.0069 U
Aroclor-1232	-	-	-	0.024 U	0.011 U	0.023 U	0.023 U	0.02 U	0.012 U	0.019 U	0.016 U	0.02 U	0.019 U	0.02 U	0.015 U
Aroclor-1242	-	-	-	0.011 U	0.005 U	0.011 U	0.01 U	0.0089 U	0.0056 U	0.0087 U	0.0072 U	0.0092 U	0.0087 U	0.0092 U	0.0069 U
Aroclor-1248	-	-	-	0.021 U	0.0097 U	0.021 U	0.02 U	0.017 U	0.011 U	0.017 U	0.014 U	0.018 U	0.017 U	0.018 U	0.013 U
Aroclor-1254	-	-	-	0.0048 U	0.0022 U	0.0046 U	0.0045 U	0.0039 U	0.0024 U	0.0038 U	0.0032 U	0.004 U	0.0038 U	0.004 U	0.003 U
Aroclor-1260	-	-	-	0.013 U	0.006 U	0.038 U	0.04 U	0.011 U	0.0067 U	0.05 U	0.130 U	0.011 U	0.011 U	0.011 U	0.0084 U
TOTAL PCB (sum of Aroclors)	< 0.1	0.1 - 1	> 1	0.0958	0.044	0.1196	0.1175	0.0788	0.049	0.1161	0.185	0.0808	0.0771	0.0808	0.0603
Pesticides															
Dieldrin	< 0.11	0.11 - 0.48	> 0.48	0.00042 U	0.00019 U	0.0004 U	0.00039 U	0.00034	0.00021 U	0.00033 U	0.00028 U	0.00035	0.00033	0.00035 U	0.00027 U
4,4-DDE	-	-	-	0.00054 U	0.00025 U	0.00053 U	0.00051 U	0.00044 U	0.00028 U	0.00785 P	0.00865 P	0.00046 U	0.00044 U	0.00045 U	0.00035 U
4,4-DDD	-	-	-	0.00064 U	0.00029 U	0.00062 U	0.006 U	0.00052 U	0.00033 U	0.00051 U	0.00043 U	0.00054 U	0.00051 U	0.00053 U	0.00041 U
4,4-DDT	-	-	-	0.00045 U	0.00021 U	0.00043 U	0.00042 U	0.00036 U	0.00023 U	0.00036 U	0.003 U	0.00038 U	0.00036 U	0.00037 U	0.00029 U
SUM OF DDT+DDD+DDE	< 0.003	0.003 - 0.03	> 0.03	0.00163	0.00075	0.00158	0.00153	0.00132	0.00084	0.00872	0.00938	0.00138	0.00131	0.00135	0.00105
CHLORDANE	< 0.003	0.003 - 0.036	> 0.036	0.011 U	0.005 U	0.011 U	0.01 U	0.0089	0.0056 U	0.0087 U	0.0072 U	0.0092	0.0088	0.0091 U	0.007 U
MIREX	< 0.0014	0.0014 - 0.014	> 0.014	0.0021 U	0.00097 U	0.002 U	0.002 U	0.0017	0.0011 U	0.0017 U	0.0014 U	0.0018	0.0017	0.0018 U	0.0014 U
SVOC															
2-Chloronaphthalene	-	-	-	0.024 U	0.011 U	0.024 U	0.023 U	0.02 U	0.012 U	0.019 U	0.032 UD	0.021 U	0.019 U	0.02 U	0.015 U
2-Methylnaphthalene	-	-	-	0.027 U	0.012 U	0.026 U	0.025 U	0.022 U	0.014 U	0.021 U	0.036 UD	0.023 U	0.022 U	0.023 U	0.017 U
Acenaphthene	-	-	-	0.03 U	0.014 U	0.029 U	0.028 U	0.025 U	0.015 U	0.024 U	0.62 JD	0.025 U	0.024 U	0.025 U	0.019 U
Acenaphthylene	-	-	-	0.027 U	0.012 U	0.026 U	0.025 U	0.022 U	0.014 U	0.021 U	0.036 UD	0.023 U	0.022 U	0.023 U	0.017 U
Anthracene	-	-	-	0.022 U	0.01 U	0.021 U	0.021 U	0.018 U	0.011 U	0.017 U	1.7 D	0.018 U	0.017 U	0.018 U	0.014 U
Benzo(a)anthracene	-	-	-	0.051 U	0.023 U	0.05 U	0.048 U	0.042 U	0.026 U	0.041 U	3.9 D	0.043 U	0.041 U	0.043 U	0.032 U
Benzo(a)pyrene	-	-	-	0.023 U	0.011 U	0.022 U	0.022 U	0.019 U	0.012 U	0.018 U	3.2 D	0.019 U	0.018 U	0.019 U	0.015 U
Benzo(b)fluoranthene	-	-	-	0.035 U	0.016 U	0.034 U	0.033 U	0.029 U	0.018 U	0.028 U	4.2 D	0.029 U	0.028 U	0.029 U	0.022 U
Benzo(g,h,i)perylene	-	-	-	0.043 U	0.02 U	0.042 U	0.041 U	0.035 U	0.022 U	0.035 U	1.5 D	0.036 U	0.035 U	0.036 U	0.027 U
Benzo(k)fluoranthene	-	-	-	0.05 U	0.023 U	0.049 U	0.047 U	0.041 U	0.026 U	0.04 U	1.4 D	0.042 U	0.04 U	0.042 U	0.032 U
Chrysene	-	-	-	0.049 U	0.022 U	0.047 U	0.046 U	0.040 U	0.025 U	0.039 U	4 D	0.041 U	0.039 U	0.041 U	0.031 U
Dibenz(a,h)anthracene	-	-	-	0.031 U	0.014 U	0.03 U	0.029 U	0.025 U	0.016 U	0.025 U	0.041 UD	0.026 U	0.025 U	0.026 U	0.02 U
Fluoranthene	-	-	-	0.022 U	0.0098 U	0.021 U	0.02 U	0.018 U	0.011 U	0.017 U	8.7 D	0.018 U	0.017 U	0.018 U	0.014 U
Fluorene	-	-	-	0.041 U	0.018 U	0.039 U	0.038 U	0.033 U	0.021 U	0.032 U	0.88 JD	0.034 U	0.032 U	0.034 U	0.026 U
Indeno(1,2,3-cd)pyrene	-	-	-	0.036 U	0.016 U	0.035 U	0.034 U	0.029 U	0.018 U	0.028 U	1.6 D	0.03 U	0.028 U	0.03 U	0.023 U
Naphthalene	-	-	-	0.037 U	0.017 U	0.036 U	0.035 U	0.03 U	0.019 U	0.029 U	0.049 UD	0.031 U	0.029 U	0.031 U	0.023 U
Phenanthrene	-	-	-	0.029 U	0.013 U	0.028 U	0.027 U	0.024 U	0.015 U	0.023 U	7.4 D	0.024 U	0.023 U	0.024 U	0.018 U
Pyrene	-	-	-	0.026 U	0.012 U	0.025 U	0.024 U	0.021 U	0.013 U	0.02 U	7.5 D	0.022 U	0.02 U	0.022 U	0.016 U
TOTAL PAH	< 4	4 - 45	> 45	0.603	0.2738	0.584	0.566	0.493	0.308	0.477	46.794	0.505	0.479	0.504	0.381
VOC															
Benzene	< 0.59	0.59 - 2.16	> 2.16	0.013 J	0.00056 U	0.0072 J	0.0081 J	0.0042	0.00062 U	0.00097 U	0.0047 J	0.001 U	0.002535 J	0.01 J	0.00077 U
Ethyl Benzene	-	-	-	0.023	0.00091 U	0.0175	0.022	0.0135	0.001 U	0.0034 J	0.062	0.0036 J	0.0063 J	0.026	0.0013 U
m/p-Xylenes	-	-	-	0.0135 J	0.0011 U	0.021 J	0.031	0.0087 J	0.0012 U	0.0042 J	0.0845	0.0032 J	0.0107 J	0.0485	0.0015 U
o-Xylene	-	-	-	0.0125 J	0.001 U	0.021	0.024	0.01035 J	0.0011 U	0.0052 J	0.055	0.0034 J	0.01005	0.0365	0.0014 U
Toluene	-	-	-	0.0038 J	0.00094 U	0.00715 J	0.0069 J	0.0017 U	0.001 U	0.0016 U	0.0096 J	0.0017 U	0.00225 J	0.005 J	0.0013 U
BTEX	< 0.96	0.96 - 5.9	> 5.9	0.0658	0.00451	0.07385	0.092	0.03845	0.00492	0.01537	0.2158	0.0129	0.031835	0.126	0.00627
Total Organic Carbon (TOC)	-	-	-	480,000	370,000	500,000	540,000	520,000	300,000	490,000	430,000	650,000	570,000	670,000	390,000

Notes:
(1) U - not detected
(2) J - estimated value
(3) D – dilution
(4) N - presumptive evidence of a compound
(5) * - for dual column analysis, the lowest quantitated concentration is reported due to coeluting interference.
1) RE indicates that a rerun was conducted on this sample and parameter, the average was reported in table.
2) DL indicates a dilution was run on the identified sample and parameter, the value from the dilution was reported in this table.
(6) Method detection limit (MDL) used for non-detected concentrations as referenced in NYSDEC TOGS 5.1.9.
(7) Total reported values for BTEX, Total PCB, Total PAH and pesticides reflect the sum of detects and MDL for non detects.

Table F-3
Summary of Sampling Results for Proposed Dredged Sediments
(Project Depth of 5.5 Feet Below MLLW)
Flushing Bay

Compound	Concentration Range (mg/kg)	Sediment Class			Average Concentration (mg/kg)	TOGS Sediment Classification
		% A	% B	% C		
Metals						
Arsenic	4.33-12.6	53	47	0	8.11	A
Cadmium	0.15-7.36	16	84	0	3.75	B
Copper	13.5-558	16	10	74	314.72	C
Lead	15.2-767	16	0	84	323.23	C
Mercury	0.06-4.49	16	0	84	2.11	C
PCB						
Total PCB (sum of Aroclors)	0.0372-0.1845	79	21	0	0.0859	A
Pesticides						
Dieldrin	0.00016-0.00051	100	0	0	0.00034	A
Sum of DDT+DDD+DDE	0.00063-0.00875	95	5	0	0.00174	A
Chlordane	0.0042-0.013	0	100	0	0.009	B
Mirex	0.0008-0.0026	21	79	0	0.0017	B
Semi-Volatile Organic Compounds (SVOC)						
Total PAH	0.234-2.749	100	0	0	0.62	A
Volatile Organic Compounds (VOC)						
Benzene	0.00047-0.01750	100	0	0	0.00332	A
BTEX	0.00377-0.13745	100	0	0	0.0388	A
Total Organic Carbon (TOC)	190,000-820,000	-	-	-	473,684	Not Applicable

Table F-4
Summary of Sampling Results for Newly Exposed Sediments
(Depth of 5.5 to 6.5 Feet Below MLLW)
Flushing Bay

Compound	Concentration Range (mg/kg)	Sediment Class			Average Concentration (mg/kg)	TOGS Sediment Classification
		% A	% B	% C		
Metals						
Arsenic	3.97-19	26	74	0	10.11	B
Cadmium	0.2-13.3	21	68	11	5.74	B
Copper	10.3-641	16	10	74	387.12	C
Lead	12.4-1540	16	5	79	547.81	C
Mercury	0.01-4.51	10.5	10.5	79	2.64	C
PCB						
Total PCB (sum of Aroclors)	0.044-0.1850	63	37	0	0.0881	A
Pesticides						
Dieldrin	0.00019-0.00046	100	0	0	0.0032	A
Sum of DDT+DDD+DDE	0.00075-0.00938	84	16	0	0.00227	A
Chlordane	0.005-0.012	0	100	0	0.0084	B
Mirex	0.001-0.0023	26	74	0	0.0016	B
Semi-Volatile Organic Compounds (SVOC)						
Total PAH	0.0274-46.794	90	5	5	3.183	A
Volatile Organic Compounds (VOC)						
Benzene	0.00056-0.01	100	0	0	0.00342	A
BTEX	0.00451-0.2158	100	0	0	0.05138	A
Total Organic Carbon (TOC)	330,000-550,000	-	-	-	454,000	Not Applicable

Surface water samples were collected at seven locations within the proposed project area and were analyzed for the same parameters as the sediments in addition to total suspended solids.

Porewater samples were collected from the material to be exposed after dredging at ten locations. The samples were analyzed for benzene, BTEX, arsenic, cadmium, copper, lead, mercury and dissolved organic carbon. The concentrations of metals and BTEX within the porewater after dredging were comparable and for some analyses such as copper, were generally lower than the corresponding surface water samples collected from the overlying water column.

C. FUTURE WITHOUT THE PROPOSED PROJECT

If the proposed environmental dredging does not occur, sediment quality conditions within Flushing Bay at and in the vicinity of the proposed project area would be expected to remain the same. While CSO discharges from Outfalls BB-006 and BB-008 would continue to contribute solids to existing accumulated sediment mounds within the bay, no significant additional contamination would be expected. Likewise as there are no currently known sources of ongoing contaminants to the proposed project area, no other significant changes to sediment quality from other sources would be anticipated.

Water quality within the bay would likewise not be anticipated to change significantly from existing conditions.

D. FUTURE WITH THE PROPOSED PROJECT

A site visit and review of available environmental and regulatory databases indicated that there are currently no significant on-going sources of hazardous materials within the proposed project area. A review of historic records, maps and photographs suggest the primary source of historic contaminants is likely attributed to past industrial practices. In addition, throughout the early decades of the 1900s, natural wetlands in the vicinity of Flushing Bay were filled to accommodate the construction and expansion of water-dependent industrial practices.

Based upon a comparison of NYSDEC TOGS 5.1.9 parameters for the materials to be dredged and the materials to be exposed after dredging, the classification of contaminant parameters and order of magnitude were generally consistent with very few exceptions. The proposed project would therefore not be expected to result in the exposure of more highly contaminated sediments, but instead would expose sediments that are largely comparable in their classification and level of contamination with the materials to be removed. The contaminants noted within these sediments are also comparable to what is typically encountered within sediments in New York Harbor, which are also typically classified as Class B or C under NYSDEC TOGS 5.1.9 based on sampling data from other projects within New York Harbor and published reports.

Concentrations of metals and BTEX within the porewater samples from the sediment to be exposed after dredging were comparable or lower than the corresponding surface water samples collected from the overlying water column, suggesting that any potential impacts from the dredging process and decant water would be minimal.

A comparison of individual NYSDEC TOGS 5.1.9 parameters indicated that the dominant sediment classifications and concentration levels within dredge depth and post-dredge sediments are largely the same for the individual parameters evaluated. The proposed project would not result in the exposure of more highly contaminated sediments, but would expose sediments that are largely comparable in their classification and level of contamination with the materials to be dredged. The dominant classifications of the sediments to be dredged were Class B or Class C, depending on the specific parameter, as shown in Table F-3 and would need to be handled as such. Dredged material management would follow the NYSDEC TOGS 5.1.9 guidance in meeting the restrictions for Class C sediments. The proposed project is anticipated to remove

accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. Potential hazardous material impacts associated with construction activities are discussed in Section G, "Construction." However, these would be limited through the implementation of a site specific construction health and safety plan and the proper management of dredge materials during construction activities. Therefore, the proposed project would not result in potential significant adverse impacts from hazardous materials. ✷

A. INTRODUCTION

According to the 2012 *CEQR Technical Manual*, a preliminary construction assessment is not required for the following technical areas: land use, zoning and public policy, cultural and historical resources, open space, socioeconomic conditions, community facilities, neighborhood character and infrastructure based on the following:

- The construction activities are not considered "long-term"[8]; or
- Short-term construction activities would not directly affect a technical area, such as impeding the operation of a community facility (e.g., result in the closing of a community health clinic for a period of a month(s).

Therefore, an assessment of construction impacts was not completed for these technical areas. Potential construction-related impacts to natural resources, hazardous materials, energy, transportation, air quality and noise are provided below.

Under the proposed project, approximately 16.8 acres of Flushing Bay along the southwest shore adjacent to the World's Fair Marina would be dredged. Sediment mounds have accumulated in Flushing Bay as a result of discharges of stormwater and untreated wastewater during wet weather events. The proposed project is anticipated to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay (see **Figure B-5**).

The anticipated duration of construction—including mobilization, dredging, wetland restoration and demobilization—would be a maximum of 24 months. The anticipated duration of the dredging portion of construction (active construction) would be a maximum of 15 months. NYSDEC and USACE permit applications would be submitted in December 2012. The notice to proceed for the proposed project would be issued two years from the effective date of these permits, and the proposed project would be completed within five years from the date of these permits per the CSO Consent Order, which requires specific dredging-related milestones. This construction schedule assumes that dredging activities would include 24-hour work days, including transport of material during two eight-hour shifts as a reasonable worst case scenario. Details related to these construction activities, and the overall construction schedule and estimated durations of construction activities are provided below. The proposed construction-related activities are expected to be completed within 24 months and would, therefore, be temporary and short-term in duration.

For the purpose of this assessment, construction phasing sequence would be as follows:

[8] The *CEQR Technical Manual* guidance considers construction less than 24 months to be of short duration.

- Phase 1
  - Remove piles from Pier 2 area
  - Dredge Pier 2 area
  - Move boats from inner area of Pier 3 area to Pier 1 or to temporary anchorage/docks
  - Move docks from inner portion of Pier 3 to temporary storage
  - Remove piles as necessary from inner area of Pier 3
- Phase 2
  - Dredge inner portion of Pier 3 area
  - Dredge shoreline area of Pier 3 area
  - Fill and re-grade shoreline area
- Phase 3
  - Install replacement piles in inner Pier 3 area
  - Relocate docks from temporary storage back to original location at inner portion of Pier3
  - Move boats from outer portion of Pier 3 to inner docks recently returned to Pier 3 or to Pier 1, if insufficient space is available
  - Temporarily move individual piles, floating docks, dredge and replace
- Phase 4
  - Return boats to outer portion of Pier 3
  - Restore shoreline

While construction locations would vary, it is projected that dredging would commence at the eastern end of the proposed dredge area (near Pier 1) and progress westward. It is expected that dredging activity would first be completed within Pier 2 without interruption and would then advance to Pier 3. Under a hydraulic dredging approach, mechanical dredging could follow the start of hydraulic dredging by approximately two weeks. The majority of the mechanical dredging would be related to shaping of the embankments. Additional embankment activities could trail the start of mechanical dredging by roughly one week, allowing time for the mechanically dredged areas to be filled with the placement and stabilization of the new fill material. The total number of working days for hydraulic dredging work is expected to be either 128 days assuming one, 12-hour shift per day or 64 days assuming two, 12-hour shifts per day. If mechanical dredging is used, the total number of working days is expected to be 86 days assuming one, 12-hour shift per day. The total number of working days for shoreline embankment work is expected to be only 39 days, performed over one, 12-hour shift.

B. METHODOLOGY

CONSTRUCTION ACTIVITIES

HYDRAULIC AND MECHANICAL DREDGING

Dredging would be performed through the use of hydraulic and/or mechanical methods. Mechanical dredging would be used along the shoreline where hydraulic dredging is not feasible. All dredging activities would be water-based within the bay and adjacent to the waterfront. All materials needed to support the proposed project (work barges, disposal barges and dewatering facilities) would be transported to the proposed dredge site or staging/dewatering site via barges and tugboats. This assessment of potential construction impacts is inclusive of both dredging methods.

Hydraulic Dredging

Hydraulic dredging involves the use of a hydraulic dredge that would be transported to the proposed project area via a tugboat. A 10-inch or 12-inch swinging ladder cutterhead dredge

would be used with a pumping reach of up to 6,000 feet. Other necessary equipment includes a high density polyethylene (HDPE) discharge pipeline, a dewatering plant consisting of a 1200-horsepower (hp) generator, a 13-hp generator, light towers, presses, hydroclones for physical separation, several drying material scows (500 to 1,000 cy capacity), clarifiers and thickeners, a mix tank, an odor control foam pump unit, 3-deck barge, 120-ton crane combos, return water pumps and pipeline, one 250-hp tending tug, and towing tugs for intermittent trips to an offsite processing facility.

Hydraulic dredging minimizes disturbance to the sediment bottom and does not expose dredged sediment to air. Under this dredge method, dredged sediment would be pumped and conveyed to dewatering barges, situated at staging locations in deeper water (see **Figure B-6**). The excess water extracted from the sediments (elutriate water) would be returned to the proposed project area via pipeline. The dewatered and stabilized sediment would be handled as a regulated solid waste requiring upland disposal at a licensed facility in accordance with federal, state and local regulations. Thus, the dredged material would be shipped to an offsite disposal facility. Alternatively, the material would be processed (mixed with a stabilizing agent) within the proposed project staging barges prior to shipment to a disposal location.

Mechanical Dredging

Mechanical dredging involves the use of barge-mounted excavators with hydraulically-actuated buckets (4 cy capacity), a crane with a clamshell bucket, decant water pumps, hoppers, a 13-hp generator, an odor control foam pump unit, three 175-hp tending tugs, and towing tugs for intermittent trips to an offsite processing facility.

Under this dredge method, sediment would be excavated with a long-reach barge-mounted excavator equipped with a clamshell bucket. The dredged material would first be placed onto small barges and then transferred to larger dewatering barges in deeper water (see **Figure B-7**). Where feasible, mechanical dredging would be performed with a 4-cy environmental bucket, which creates a watertight seal. The smaller barges would be offloaded to the larger barges using a barge-mounted excavator or a crane with a clamshell bucket. Drip pans or similar equipment would be used to prevent potential spillage of material back into surface waters within the proposed project area. Dredged material on the larger barges would settle for a minimum of 24 hours before the decant water is pumped back to the proposed project area. The dewatered and stabilized sediment would be handled as a regulated solid waste requiring upland disposal at a licensed facility in accordance with federal, state and local regulations. The larger barges would transfer dredged material to an approved disposal facility to be processed and shipped to an offsite disposal location. Alternatively, dredged material would be processed within the proposed project staging barges prior to shipping to a disposal location.

Accessory Activities

Support activities such as post-dredging bathymetric surveys, operation of odor control measures, removal and disposal of debris, removal and replacement of marina piles, installation and maintenance of turbidity curtains, and the maintenance of electrical power, water supply, and public access at Pier 3 during construction, would also be performed during construction.

SHORELINE EMBANKMENT RECONSTRUCTION

Reconstruction of the existing shoreline embankment would include modification of nine existing stormwater outfalls in the proposed project area. Existing stormwater pipes would be extended out to the proposed new shoreline to allow continued drainage out to the bay. Embankment materials would be mechanically placed along the shoreline from a barge using backhoes, excavators and loaders. Additional equipment would include a 134-hp generator and a 700-hp tugboat. Shoreline embankment reconstruction activities would occur simultaneously with the proposed project.

TIDAL WETLAND RESTORATION

Wetland restoration would consist of new plantings along the shoreline of the existing intertidal wetland habitat to create new and enhanced intertidal or high marsh tidal wetland zones. Fill material placed along the shoreline would provide a suitable soil media for the proposed plantings. Planting would include transport of plant materials to the site via tractor-trailers, and use of small equipment and hand-tools to manually plant the shoreline. Wetland restoration activities would occur after construction completion and during early spring, the preferred planting time.

SLOPE RECONSTRUCTION

Slope reconstruction would provide the necessary soil base and slopes for the proposed wetland restoration. Reconstruction would involve filling and grading along the shoreline using backhoes, excavators and loaders, from barges. Clean fill material would be placed along the shoreline to establish a planting surface between mean high and mean low water. Slope reconstruction would occur simultaneously with construction.

CONSTRUCTION STAGING

The proposed project would require temporary in-water staging barges that would be operational throughout the entire construction period. The proposed construction staging locations would be in deeper water to allow navigable access to marine vessels in the vicinity of the proposed project area. The proposed staging barges would be approximately 250 feet long and 50 feet wide. Based on the required area, water depth, and necessity to avoid interference with marine navigation, two reasonable worst-case locations for the placement of the construction barges have been identified (see **Figure B-4**):

- Anchorage Area (East of Pier 3) – this location would be within the federal anchorage immediately northeast of Pier 3; and
- North of Pier 1 – this location would be at the edge of the federal navigation channel west of Pier 1.

These potential locations reflect probable easternmost and westernmost sites that would be nearest to the shoreline, where water depth would be adequate for the barge. In addition, these potential locations would be outside the designated navigation channel boundary and therefore, would not interfere with boat traffic. Finally, these two locations would be reasonably proximate to the sensitive receptors nearest the proposed project area, which includes the Pier 3 marina and the banquet facility, the Pier 1 public pier, and the waterfront promenade. The final staging location could vary between these two locations and limitations would be imposed on the contractor, including: no unreasonable interference with marine navigation and no impact to airport operations at LaGuardia Airport. If impacts in a technical area would be greater at one location, those impacts are considered in the below analysis.

NATURAL RESOURCES

The proposed project would directly disturb sediments in the vicinity of Piers 2 and 3. However, as discussed in Section E, "Natural Resources," existing natural resources are limited at this location, due to a lack of natural shoreline, limited water depth, degraded water quality and sedimentation within the proposed project area. The proposed project would affect approximately 16.8 acres of benthic habitat within the proposed project area. This would result in a temporary impact to fish and benthic invertebrates through loss of benthic habitat and increased turbidity during environmental dredging activities. Benthic communities that would be disturbed during construction activities would likely recolonize the area after completion.

An Essential Fish Habitat (EFH) Assessment was completed (see **Attachment D**) and states that due to the existing degraded water quality conditions and physical characteristics within Flushing Bay, many aquatic and benthic species would not be expected to occur in high densities within the proposed project area due to the very shallow intertidal habitat as well as the developed and modified shoreline adjacent to the proposed project area, which is a limiting factor for species due to a lack of basic habitat needs. The EFH concluded that construction activities, which are expected to be localized, temporary and short-term in duration and would include turbidity abatement measures, would not be expected to result in potential significant adverse impacts to designated species.

Specifically, the following measures would be implemented to minimize potential impacts to natural resources during construction:

- A turbidity curtain constructed of filter fabric with folds to accommodate water elevation fluctuations would enclose the entire proposed project area to protect Flushing Bay waters from re-suspended sediments during construction. Rope or cables with attached floats would be used to suspend the top of the curtains on the water surface and a chain or weight would be fixed to the bottom to stretch the fabric to the floor of the bay. The curtain would be in place throughout the entire duration of construction and would only be opened as necessary to allow for vessel ingress/egress.
- Turbidity outside of the curtain would be visually monitored for turbidity levels over ambient conditions. If turbidity outside of the curtain is observed, dredging operations would be suspended until conditions return to the normal state and/or the cause of the excess turbidity is determined.
- Return water at the staging/dewatering area would be monitored on a regular basis in compliance with any regulatory permits.
- If mechanical dredging techniques are utilized, drip pans would be used between the barges to prevent spillage during transfer of materials.

The proposed project would be necessary to remove accumulated sediment mounds and associated nuisance odors. The proposed project would be temporary and short-term in duration and appropriate control measures, as discussed above would be implemented to reduce potential impacts to EFH designated species. In addition, the proposed tidal wetland restoration program would enhance and restore wetlands along the shoreline. Therefore, the proposed project would not result in potential significant adverse impacts to natural resources during construction.

HAZARDOUS MATERIALS

A site visit and review of available environmental and regulatory databases indicated that there are currently no significant on-going sources of hazardous materials within the proposed project area (see Section F, “Hazardous Materials”). A review of historic records, maps and photographs suggest the primary source of historic contaminants is likely attributed to past industrial practices. In addition, throughout the early decades of the 1900s, natural wetlands in the vicinity of Flushing Bay were filled to accommodate the construction and expansion of water-dependent industrial practices. Within the upland limits of the proposed project area, no significant sources of potential contamination were noted.

The same protection measures described above under Natural Resources would also minimize potential construction impacts associated with the re-suspension of existing sediments and potential impacts from hazardous materials. As stated above, the proposed project area would be isolated by a turbidity curtain, which would minimize potential impacts during construction. In addition, a Construction Health and Safety Plan (CHASP) would be developed to limit potential impacts to workers and the surrounding community during construction activities. Under the

proposed project, all construction-related tasks, from mobilization to de-mobilization, would be completed within 24 months and would be temporary and short-term in duration. Therefore, the proposed project would not result in potential significant adverse impacts to hazardous materials during construction.

ENERGY

The equipment used for both dredging methods and dewatering activities would require the use of diesel fuel generators. Under the proposed project, a 900-kilowatt (kW) generator would be used to power dewatering equipment should hydraulic dredging be used and onsite dewatering conducted. The number and size of generators used would be determined by the contractor. A hydraulic dredger would utilize an approximately 600 hp engine and a 400-hp pump. Mechanical dredging would involve the use of tugboats and excavators with engine sizes ranging from 175 to 420 hp. Under the proposed project, all construction-related tasks, from mobilization to de-mobilization, would be completed within 24 months and would be temporary and short-term in duration. Therefore, the proposed project would not result in potential significant adverse impacts to energy during construction.

TRANSPORTATION

The proposed project would not add any significant vehicular traffic during construction. Water-based transport would be the primary method for moving equipment and materials to and from the proposed project area. Equipment that is not brought to the site by barges and tugboats would be brought by truck. Potential truck trips would be primarily associated with mobilization and de-mobilization activities over a very limited period of time, while passenger car trips would occur over the duration of construction. Under the hydraulic dredging approach, tractor trailers would be used to bring equipment to a mobilization/demobilization site that would be determined by the contractor. Equipment would then be loaded onto barges at a site outside the proposed project area and transported to the site via tugboats. Approximately 60 total truck trips (30 trips in and 30 trips out) for equipment and material deliveries would be required throughout the duration of construction including mobilization and demobilization. In accordance with the *CEQR Technical Manual* (2012), a 2.5-passenger car equivalent (PCE) for truck trips was applied for the construction of the proposed project, yielding a total of 150 PCE trip ends over the duration of construction. For the purposes of this assessment, it was assumed that, on average, approximately 10 PCE trip ends would occur each day during mobilization and demobilization activities.

In addition, it is assumed that a maximum of 54 worker passenger vehicles would use the local street network during each day during peak construction activities, when dredging work would be occurring over the maximum of 24 hours per day (two 12-hour shifts). When dredging work would occur for less than 24-hours per day or during other construction activities not requiring 24-hour per day work, it is estimated that there would be a maximum of 27 worker passenger vehicles per shift. Thus, the average number of workers during non-peak construction phases and throughout the duration of construction would be less than the number of workers during the peak dredging phase.

Assuming all construction trucks travel during one shift (10 PCE trip ends) and worker vehicles from that same shift (27 worker passenger vehicles) traveled during the same peak hour during the peak construction activities, there would be a maximum of 37 peak hour vehicle trip ends, which would not exceed the *CEQR Technical Manual* 50 peak hour vehicle trip end threshold. Combined truck trip ends and employee vehicle trip ends during one shift would total 37 trips, which is below the CEQR screening threshold.

The proposed project would not affect existing public parking in the vicinity of the proposed project area (see Section B, “Land Use, Zoning, and Public Policy”). To the greatest extent

practicable, marine-based transportation activities would be limited and coordinated with appropriate agencies, thereby minimizing potential conflicts with existing marine traffic in Flushing Bay. Under the proposed project, all construction-related tasks, from mobilization to de-mobilization, would be completed within 24 months and would be temporary and short-term in duration. Therefore, the proposed project would not result in potential significant adverse impacts to transportation during construction.

AIR QUALITY

The proposed project would result in a temporary increase in stationary and mobile combustion sources during construction, which are addressed below.

MOBILE SOURCES

Because the proposed project is not expected to significantly alter traffic conditions, maximum hourly incremental traffic would not exceed the *CEQR Technical Manual* carbon monoxide screening threshold of 170 peak hour trips at nearby intersections in the proposed project area, nor would it exceed the particulate matter emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*. Therefore, the proposed project is not expected to result in potential significant adverse air quality impacts from mobile source emissions.

STATIONARY SOURCES

Potential impacts to air quality during construction would primarily result from stationary sources and the use of diesel-powered equipment, including a diesel-powered hydraulic dredge, mechanical excavators, generators, pumps, tugboats, and pile driving equipment. **Table G-1** presents a list of potential equipment for both hydraulic and mechanical dredging, dewatering, and support activities such as shoreline embankment and slope reconstruction.

The use of diesel fuel to power construction equipment would result in emissions from stationary (and mobile) sources. These construction activities would be subject to New York City Local Law 77, which requires the use of best available technology (BAT) for construction equipment[9]. All construction equipment would need to meet at least EPA Tier 2 emission standards. DEP would require the contractor to use ultra-low sulfur diesel (ULSD) for all diesel engines throughout the construction period and to reduce particulate matter emissions to the extent practicable by installing diesel particulate filters (DPFs) as emissions controls on all diesel equipment greater than 50 hp. If the use of DPF interferes with the equipment operation, diesel oxidation catalysts (DOCs) would be required.

As shown in **Figure B-9**, sensitive receptors within 400 feet of the proposed project include The World's Fair Marina, waterfront promenade and Flushing Meadows-Corona Park. Both the marina and waterfront promenade, just upland of the proposed project area, are part of Flushing Meadows-Corona Park. The marina provides dockage for about 300 recreational vessels and is operated by DPR. The nearest building to the proposed project area is the World's Fair Marina Restaurant and Banquet Hall, which fronts on Flushing Bay near Pier 3. The nearest residence to

[9] New York City Administrative Code § 24-163.3, adopted December 22, 2003, also known as Local Law 77, requires that any diesel-powered non-road engine with a power output of 50 hp or greater that is owned by, operated by or on behalf of, or leased by a city agency shall be powered by ultra-low sulfur diesel fuel (ULSD), and utilize the best available technology (BAT) for reducing the emission of pollutants, primarily particulate matter and secondarily nitrogen oxides. DEP is charged with defining and periodically updating the definition of BAT.

the proposed project area is approximately 430 feet south of the proposed project area, on the opposite side of the Grand Central Parkway.

Table G-1
Anticipated Equipment for Construction Activities

Hydraulic Dredging/Dewatering	
Cutter Head Hydraulic Dredge	600 hp
Discharge pipeline	NA
Generator	1200 hp
Generator	13 hp
Excavators	420 hp
Crew boat/skiffs	100 hp
Light Towers	100 hp
Pump	400 hp
Tugboats	250 hp
Filter Presses	Powered by the 1200-hp generator
Hydroclones/Sand Separators	Powered by the 1200-hp generator
Clarifier/Thickener	Powered by the 1200-hp generator
Return water pumps/Fast Fill Pumps	Powered by the 1200-hp generator
Mix Tank	Powered by the 1200-hp generator
Press Pre-Coat Mix Tank	Powered by the 1200-hp generator
Odor Control Foam Pump Unit	NA
Deck Barge 120 ton Crane Combos	332 hp
Mechanical Dredging	
Excavators	420 hp
Tugboat	175 hp
Crane	332 hp
Tugboat	1900 hp
Generator	13 hp
Pumps	200 hp
Hydraulic Bucket	332 hp
Odor Control Foam Pump Unit	NA
Hoppers	NA
Shoreline Embankment/Slope Reconstruction and Support Activities	
Backhoes/Excavators	420 hp
Tugboat	700 hp
Generator	134 hp
Bobcat loader (1 cy)	61 hp

Since stationary source engines would utilize ULSD fuel, and incorporate BAT, the proposed project is not expected to exceed the *CEQR Technical Manual* guidance thresholds and ambient air quality standards. Therefore, the proposed project would not result in potential significant adverse impacts to air quality from stationary source emissions during construction.

MOBILE AND STATIONARY SOURCE CONSTRUCTION IMPACTS CONCLUSIONS

The use of ULSD, BAT, and best management practices incorporated into the work by the contractor would minimize potential mobile and stationary sources of emissions during construction and any effects on sensitive receptors. In total, all construction from mobilization to de-mobilization would be completed within 24 months and is temporary and short-term in

duration. Therefore, the proposed project is not expected to result in potential significant adverse impacts to air quality from mobile and stationary sources during construction.

ODORS

The objectives of the proposed project are to remove accumulated sediment mounds exposed at low tide in the area of CSO outfalls BB-006 and BB-008 and to reduce associated nuisance odors. The removal of deteriorated timber piles at Pier 2 and the restoration of wetlands along the shoreline would further improve the aesthetics of the bay. Currently, nuisance odors occur in the proposed project area, particularly when the existing accumulated sediment mounds are exposed to air at low tide. The average hydrogen sulfide (H_2S) level under existing conditions averages 37 parts per billion (ppb) at low tide (measured over a 6-hour period) at one location on the waterfront promenade. The use of mechanical dredging would likely result in a temporary increase in odors during dredging activities. Similar to existing conditions, an increase in odors would result when the sediments are disturbed and exposed to the air. Under the mechanical dredge method, dredged material would be placed within scows for transport to the staging/dewatering barge. Materials would then be placed within hopper barges for transport to an off-site disposal facility in accordance with federal, state and local regulations.

To reduce dredging-related odors to the greatest extent practicable, DEP would implement a community air monitoring program (CAMP). The CAMP would be in place at the start of construction mobilization through demobilization. Under the CAMP, a semi-permanent air quality monitor would be installed on shore at each dredge location to continuously record and track H_2S levels. The contractor would be required to keep an onsite record of hourly H_2S readings and submit a monthly report to DEP. The monthly report would also include logged readings, actions taken to mitigate increased levels of H_2S, as well as any complaints received from residents or recreational users adjacent to the proposed project area.

In addition, odor controls would be implemented during dredging and sediment loading and processing activities to minimize odors resulting from increased concentrations of H_2S. If concentrations surpass an hourly average of 56 ppb (Nuisance Threshold), odor controls would be implemented within the limits of the proposed dredge area, as well as at the staging and dewatering areas when sediments are being loaded or transferred into barges.

Potential odor controls include, but are not limited to the following:

- Foaming agent: Perfumes applied directly to dredged material, prior to and during transport and disposal.
- Neutralizing agent: Perfumes sprayed into the air through a fogging process. If an odor neutralizing product is used, the chemicals would be non-toxic, non-hazardous and would not contain surfactants, petroleum distillates, or chlorinated solvents. The fogging process would be accomplished through the use of a wet fogger that would be used to apply light-to-heavy amounts of water-based deodorizing treatments to the air, which would then cover the dredged materials.

The frequency of application of odor control products would depend on the product selected, as alternative products may require different application procedures and would also be based on the level of odors detected by the CAMP. Weather and related temperature conditions (e.g., warm temperatures) would also be considered to avoid exacerbation of odors during construction to the greatest extent possible.

If hourly H_2S levels increase to 250 ppb (Action Threshold), the contractor would immediately notify DEP of these levels and measures taken to reduce odors to below this threshold, called the Action Threshold. In addition to the above odor control measures, dredging may be stopped and restricted to evenings and nights, periods of colder weather, and/or periods of less frequent

recreational activity. If necessary, the waterfront promenade may be temporarily closed to pedestrians during the construction period. Dredging would resume once it is reasonable to assume that the odor level is below the Action Threshold. **Table G-2** summarizes the odor reduction and public safety measures DEP would implement under the CAMP.

Table G-2
Odor Reduction Measures During Dredging

Odor Threshold	Hourly H_2S Level	Measure(s)
Nuisance	56 ppb and above	• Contractor examines equipment and corrects issues that may contribute to increased odors • Implement odor controls
Action	250 ppb and above	• Restrict dredging and/or temporarily close waterfront promenade to pedestrians • Temporarily cease all dredging activities until reasonable to assume odor level is under control

The anticipated duration of construction—including mobilization, dredging, wetland restoration and demobilization—would be a maximum of 24 months. The anticipated duration of the dredging portion of construction (active construction) would be a maximum of 15 months. Coupled with this relatively short dredging duration, air quality would be continuously monitored during the dredging period through the aforementioned CAMP, which would enable the contractor to restrict or temporarily cease dredging activities on an as-needed basis and odor controls would be utilized to reduce nuisance odors during dredging to the greatest extent practicable. Therefore, due to the relatively short duration of dredging activities, implementation of a CAMP, application of odor controls, continuous air quality monitoring and enforcement of maximum threshold standards, the proposed project would not result in potential significant adverse impacts from odors during construction.

NOISE AND VIBRATION

Noise levels caused by construction activities would vary, depending on the location of the dredging activities relative to receptor locations. Noise and vibration levels at a given location are dependent on the kind and number of pieces of equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating at full power), the distance from the dredging site, and any shielding effects (from structures such as buildings, walls, or barriers). The most significant noise sources are expected to be tug boats used in barge operations, and dredges and excavators used in dredging and/or shoreline embankment operations. Noise levels in the vicinity of the proposed project area would temporarily increase during construction activities, but would vary depending on the method of dredging and the specific equipment chosen by the contractor.

EFFECTS OF NOISE ON PEOPLE

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 such activities as sleep, verbal communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. 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. However, the stated effects of noise vary greatly with each individual.

NOISE MEASUREMENT

A number of factors affect sound as perceived by the human ear. These include the actual sound (or noise) levels, frequencies, period of exposure, and changes or fluctuations in noise levels during exposure. Noise levels are measured in units called decibels (dBs). Since the human ear cannot perceive all pitches or frequencies equally well, this measure is 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 this construction noise analysis, all measured levels are reported in dBA or A-weighted decibels. Typical sound levels for various types of activities are shown in **Table G-3**.

Table G-3
Common Noise Levels

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 1,640 feet	100
Freight train at 100 feet	95
Train horn at 100 feet	90
Heavy truck at 50 feet	80-90
Busy city street, loud shout	80
Busy traffic intersection	70-80
Highway traffic or train at 50 feet	70
Predominantly industrial area	60
Light car traffic at 50 feet, city or commercial areas, or residential areas close to industry	50-60
Background noise in an office	50
Suburban areas with medium density transportation	40-50
Public library	40
Soft whisper at 15 feet	30
Threshold of hearing	0

Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.

Source: Cowan, James P. *Handbook of Environmental Acoustics,* Van Nostrand Reinhold, New York, 1994.
Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

Community Response to Changes in Noise Levels

The average ability of an individual to perceive changes in noise levels is well documented (see **Table G-4**). 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.

Table G-4
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 Newman, Inc. *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration. June 1973.

Noise Descriptors Used in Impact Assessment

Because a sound pressure level measured in dBA describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over more extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific period as if it is a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," or "L_{eq}," can be computed. L_{eq} is the constant sound level in a given situation and period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted by $L_{eq(24)}$) that conveys the same sound energy as the actual time-varying sound. **Figure B-30** shows an example of the relationship between the instantaneous noise level over a measurement period and the L_{eq} over the same period. The measurement was performed using the same spot noise measurement procedures described in the "Methodology" section below. **Figure B-30** shows that the instantaneous level may fluctuate, whereas the L_{eq} value includes all of the sound energy in all of the instantaneous levels during the measurement period.

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. In addition, the L_{max} and L_{min} noise descriptors can be used to describe the maximum and minimum instantaneous noise levels, respectively, during a given period.

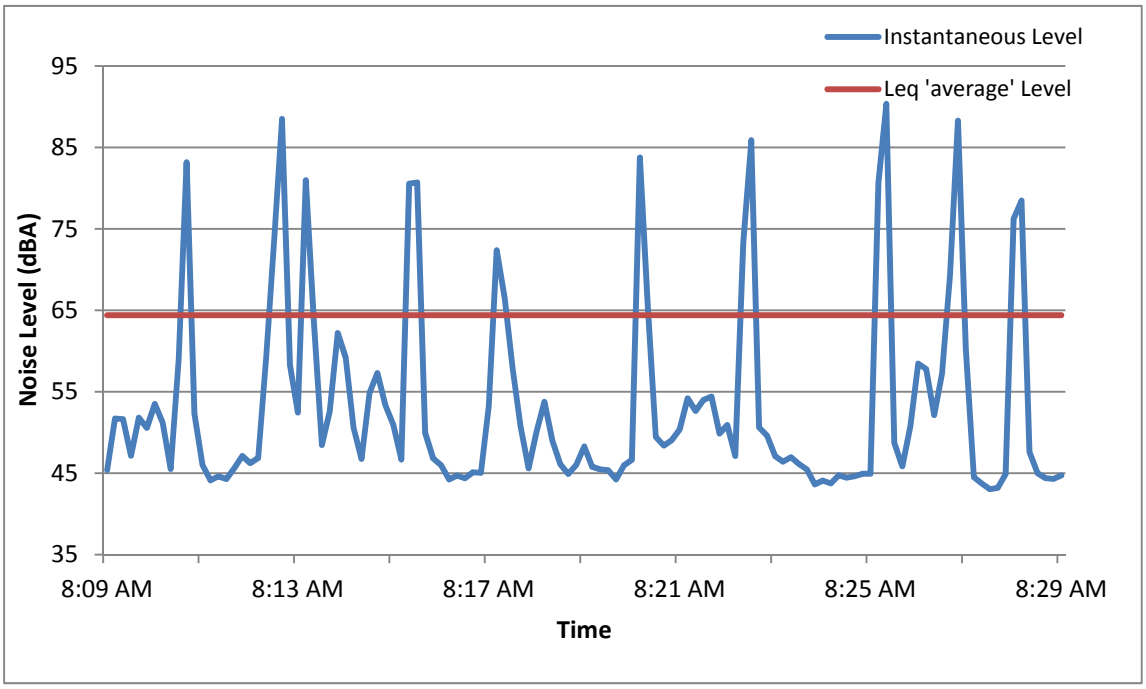


Figure B-30 Instantaneous Noise Level vs. L_{eq}

The maximum 1-hour equivalent sound level ($L_{eq(1)}$) is the noise descriptor that best reflects human perception of environmental noise. This measure also includes all of the sound energy associated with construction activity, and provides an indication of highest expected incremental sound levels. Further, this is the measure recommended for use in the *CEQR Technical Manual* (2012) for construction noise impact evaluation. Consequently, for purposes of analyzing the proposed project, the $L_{eq(1)}$ has been selected as the noise descriptor to be used for noise impact evaluation.

CONSTRUCTION NOISE IMPACT CRITERIA

The *CEQR Technical Manual* (2012) states that significant noise impacts due to construction would occur "only at sensitive receptors that would be subjected to high construction noise levels

for an extensive period of time." This has generally been interpreted to mean that such impacts would occur only at sensitive receptors where the activity with the potential to create high noise levels would occur continuously for approximately two years or longer. In addition, the *CEQR Technical Manual* (2012) states that the impact criteria for vehicular sources, using the No Action noise level as the baseline, should be used for assessing construction impacts. As recommended in the *CEQR Technical Manual* (2012), this study considered the following criteria in evaluating the potential for significant adverse noise impacts:

- If the No Action noise level is less than 60 dB(A) $L_{eq(1)}$, a 5 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is 61 dB(A) $L_{eq(1)}$, a 4 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is equal to or greater than 62 dB(A) $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10pm and 7am), the incremental significant impact threshold would be 3 dB(A) $L_{eq(1)}$.

METHODOLOGY

The small number of vehicular trips associated with the proposed project would not have an appreciable effect on ambient noise levels at nearby sensitive receptors. Therefore, the noise analysis focuses on noise generated by the proposed project, dewatering, and shoreline embankment activities. The noise analysis consisted of the following:

- Identify receptor locations at noise-sensitive land uses closest to the dredging site that are representative of locations subject to temporary impacts from construction activities, including publically-accessible locations along the waterfront near the proposed project locations and the closest residences and residential areas ;
- Measure existing daytime and nighttime noise levels at the selected receptor locations between 7am and approximately 11pm;
- Determine noise characteristics of the environmental dredging activities, based on individual equipment sound power levels for equipment expected to be included in the dredging site and the anticipated location of equipment;
- Calculate noise levels at sensitive receptor locations using mathematical models and acoustical fundamentals; and
- Compare calculated noise levels with CEQR noise level impact criteria.

The construction noise analysis looked at worst-case conditions (i.e., the conditions that would have the potential for producing the maximum noise levels) for the proposed construction activities. Noise from the operation of construction equipment would vary over the construction period. Therefore, the likely major phases of construction were evaluated to determine the likely potential noise impacts at locations immediately adjacent to the dredging site and at the nearest residential receptors. The incremental noise impact at these locations were calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site, and determining the incremental noise levels over measured baseline conditions. Two potential staging barges were considered for the reasonable worst case assessment. Staging Barge 1 would be located within the federal anchorage area northeast of Pier 3 and Staging Barge 2 would be located at the edge of the federal navigation channel west of Pier 1. The potential of using either staging barge location was analyzed with the calculated maximum potential impacts presented in this assessment. Assumptions about the equipment to be used were based on DEP's "Preliminary Design Report for Flushing Bay, Queens New York" (AECOM/HydroQual, November 2012) and assumptions about noise generation were based on typical values.

Table G-5 shows the construction equipment noise reference levels and usage factors used in this analysis.

Table G-5
Selected Construction Equipment Noise Reference Levels and Usage Factors

Equipment Description	Acoustical Usage Factor (Percent)[1]	Typical L_{max} Noise Levels at 50 feet (dBA)[2]
Dredge	50	85
Generator	100[3]	82
Excavator	40	85
Light Tower	50	70
Pumps	50	77
Tug Boats	20	85
Crane	16	85
Bobcat	40	85
Impact Pile Driver	20	101

Notes: [1] An estimation of the fraction of time each piece of construction equipment (*Federal Highway Administration Roadway Construction Model User's Guide*, Jan 2006) is operating at full power (i.e., its loudest condition) during construction operation.
[2] A-Weighted maximum sound level, measured at a distance of 50 feet from the construction equipment.
[3] it was conservatively assumed that the generators would operate 100 percent of the time.

A-weighted sound pressure levels, L_p, at receptor sites were calculated based on the combined sound power levels of all the equipment expected to be operating at the proposed project site using the following formula:

$L_p = L_w - A_{div} - 0.6$

where:

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

A_{div} is the attenuation due to geometrical divergence (i.e., the attenuation of noise levels due to distance from the noise source).

Attenuation due to geometrical divergence treated each piece of equipment as a point source of noise, resulting in a 6 dB decrease per doubling of distance to the receptor, as specified in equation 19-2 from Chapter 19, "Noise," of the *CEQR Technical Manual*.

The predicted future noise levels during peak construction activities were calculated by combining the projected noise levels due to cumulative construction activities with the measured existing levels. The peak period assumed construction activities during dredging, dewatering, transport, and disposal would occur simultaneously with shoreline embankment and slope reconstruction. The proposed construction activities were assumed to occur immediately adjacent to the shoreline (the location nearest the identified sensitive receptors), while the dewatering and transport barge loading activities were assumed to occur at either one of the two dewatering staging barge locations (see **Figure B-4**); the shoreline embankment and slope reconstruction activities were assumed to occur along the shoreline of the proposed project area. Both hydraulic and mechanical dredging methods were analyzed. Since under hydraulic dredging there would likely be more potential noise sources than with mechanical dredging (e.g., a 600-hp hydraulic dredge and a 1200-hp generator), results for hydraulic dredging are expected to be "worst-case". As a reasonable worst-case assumption, no noise attenuation measures, such as noise barriers or

curtains, were assumed in the analysis. The selected contractor would be required to comply with Local Law 113 of 2005 and the revised New York City Noise Control Code, requiring the development of a Construction Noise Mitigation Plan prior to the start of work. This plan would include noise minimization strategies, methods, procedures and technologies for each piece of equipment or activity performed at the site during construction. Noise attenuating best management practices would be implemented as necessary to the greatest extent practical. Future noise levels were then compared to the baseline measurements to determine the noise level increase expected with the proposed construction activities. The resulting noise level increases were then compared to the CEQR criteria to determine whether the proposed project would result in any potential significant noise impacts at nearby sensitive receptor sites.

EXISTING NOISE LEVELS

The noise receptor locations considered in the analysis are as follows (see **Figure B-31)**:

- Receptor Site 1 is located in a residential area with heavy traffic along Astoria Boulevard between 112th Place and 112th Street.
- Receptor Site 2 is an open space located at the north end of the waterfront promenade, subject to heavy traffic and background noise from Grand Central Parkway.
- Receptor Site 3 is located on the waterfront promenade at the World's Fair Marina Restaurant, subject to heavy traffic and background noise from the Grand Central Parkway.
- Receptor Site 4 is an open space on Pier 1 at the waterfront promenade, subject to distant background noise from Grand Central Parkway.
- Receptor Site 5 is located on the Grand Central Parkway Pedestrian Overpass, between Ditmars Boulevard and the waterfront promenade. It is located near the closest residence to the proposed project and is subject to heavy traffic and background noise from Grand Central Parkway.

Since aircraft takeoffs associated with LaGuardia Airport were audible at all noise monitoring locations, existing noise levels were monitored both with and without aircraft flyovers. With aircraft flyovers, the aircrafts were considered to be the dominant noise source. Without aircraft flyovers, vehicular traffic was the dominant noise source.

Noise measurements were taken on a weekday between 7am and approximately 11pm. These measurements were used to approximate the noise levels during all times of the day at all noise receptor locations. It is possible that construction activities, such as dredging and dewatering could occur for 24 hours on a short-term and temporary basis. Shoreline equipment such as the excavator, bobcat, and tugboat would not be operating for 24 hours, but would operate during the daytime shift. An analysis of these potential nighttime activities was conducted to determine the maximum noise levels at the nearest residences and residential areas. Noise measurements were taken for 20 minute intervals.

The following measurement procedure was used:

- Noise measurements were made at the noise monitoring locations listed above both with and without aircraft flyovers;
- Measurements were performed using two sound level meters simultaneously—one sound level meter ran continuously and the second sound level meter was paused to filter-out aircraft related noise events;
- Using acoustical fundamentals and the noise measurement results, a spreadsheet was used to calculate/isolate the "aircraft only" noise component for the measurements taken with aircraft flyovers;

Noise monitoring was not performed when:

- Area pavement was not generally dry;
- Winds were greater than 12 miles per hour;
- Relative humidity exceeded 90 percent;
- There was non-typical noise such as that caused by construction, sirens, idling trucks.

Equipment Used During Noise Monitoring

Measurements were performed using Brüel & Kjær Sound Level Meters (SLMs) Type 2250 and Type 2270, a Brüel & Kjær Sound Level Calibrator Type 4231, Brüel & Kjær ½-inch microphones Type 4189. The Brüel & Kjær SLMs are Type 1 instruments according to ANSI Standard S1.4-1983 (R2006). For all receptor sites the instrument/microphone was mounted at a height of approximately 5 feet above the ground. Microphones were mounted approximately more than 5 feet away from any large reflecting surfaces. The SLMs were last factory calibrated on April 25, 2012 and February 21, 2012, respectively. The calibration of the SLMs was field-checked before and after readings using the Brüel & Kjær Type 4231 sound level calibrator with the appropriate adaptors. Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the sound level meters 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} levels. A windscreen was used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

Noise Measurement Results

The results of the noise measurements are shown in **Table G-6**.

At receptors 1 and 5, which represent noise levels at residences and residential areas closest to the proposed project construction activities, existing noise levels range from 67 dBA to 74 dBA both with and without aircraft flyovers. Vehicular traffic on adjacent roadways is the dominant noise source at these locations.

At receptors 2 and 3, which are representative of locations on or near the waterfront promenade near the proposed project construction activities, existing noise levels range from approximately 63 dBA to 68 dBA with aircraft flyovers and from approximately 61 dBA to 66 dbA without aircraft flyovers. Aircraft flyover noise and vehicular traffic on Grand Central Parkway are the dominant noise sources.

At receptor 5, which is representative of the open space on Pier 1 at the waterfront promenade, existing noise levels range from approximately 63 dBA to 74 dBA with aircraft flyovers and from approximately 58 dBA to 63 dBA without aircraft flyovers. Aircraft flyovers are the dominant noise source.

Table G-6
Existing Daytime/Nighttime Noise Levels at Spot-Measurement Locations (dBA)

Site	Measurement Location	Time	Length	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	Aircraft Component (L_{eq})[3]
1	Residential Area along Astoria Boulevard between 112th Place and 112th Street	7:19am	20:00	71.2	78.7	74.9	68.5	61.4	65.0
			13:56	70.0	78.6	73.6	66.9	60.9	
		1:08pm	20:03	71.4	78.7	74.9	69.4	62.9	59.6
			15:09	71.1	78.9	74.4	68.7	62.4	
		5:27pm	20:00	73.4	80.5	75.9	72.7	65.3	0.0
			13:58	73.5	80.9	75.8	72.6	65.3	
		7:14pm	20:04	71.6	79.8	74.0	69.0	62.5	67.1
			14:38	69.7	77.2	73.0	68.1	62.2	
		10:44pm[1]	20:00	67.2	75.1	71.2	64.1	59.8	50.8
			20:00	67.1	75.0	71.2	64.0	59.7	
2	Open Space at the North End of Waterfront Promenade	8:17am	20:00	64.8	72.2	67.1	63.0	61.6	60.5
			12:08	62.8	66.5	63.6	62.5	61.6	
		10:49am	20:00	64.3	71.6	67.3	62.6	60.9	59.4
			15:14	62.6	67.8	63.7	62.2	60.7	
		2:01pm	20:00	63.2	69.9	65.1	62.2	60.5	56.7
			15:31	62.1	65.3	63.6	61.9	60.4	
		4:32pm	20:00	64.4	73.7	66.1	62.5	61.1	59.9
			13:19	62.5	67.0	63.5	62.2	61.0	
		8:12pm	20:00	63.4	70.4	67.3	61.3	59.2	59.8
			12:44	60.9	64.6	62.3	60.8	58.6	
3	Waterfront Promenade at World's Fair Marina Restaurant	8:45am	20:00	67.7	74.9	70.1	66.1	64.9	63.0
			12:00	65.9	71.2	66.5	65.4	64.4	
		10:22am	20:00	68.0	75.9	70.4	66.0	64.4	64.4
			12:42	65.5	68.4	66.7	65.4	64.0	
		2:28pm	20:00	66.9	74.9	69.4	65.2	63.7	62.2
			12:56	65.1	70.2	66.0	64.7	63.5	
		4:05pm	20:00	66.5	73.6	69.1	65.0	63.7	61.2
			12:49	65.0	69.0	65.9	64.6	63.5	
		8:38pm	20:00	66.2	73.6	68.8	64.5	62.6	62.3
			12:58	63.9	67.0	65.3	63.8	62.2	
		10:13pm[2]	20:00	63.7	67.0	65.2	63.5	61.5	47.3
			20:00	63.6	66.9	65.1	63.5	61.4	
4	Open Space on Pier 1 at Waterfront Promenade	9:21am	20:00	73.6	85.8	75.9	62.7	60.5	73.3
			10:26	61.5	64.5	62.5	61.1	60.2	
		9:43am	20:00	70.7	81.8	73.8	62.4	60.2	69.9
			10:32	63.1	73.4	63.0	61.0	59.8	
		3:04pm	20:00	63.0	75.0	65.0	58.4	57.4	61.3
			14:25	58.2	60.1	59.1	58.1	57.2	
		3:26pm	20:00	66.0	77.8	69.0	59.3	57.9	65.0
			12:04	59.2	65.0	60.3	58.5	57.6	
		9:11pm[1]	20:00	64.0	74.3	66.4	60.5	58.5	61.5
			15:38	60.4	64.6	61.7	60.0	58.2	
		9:39pm[1,2]	20:00	60.3	63.7	61.8	59.9	58.6	43.9
			19:35	60.2	63.8	61.7	59.8	58.4	
5	Pedestrian Overpass between Ditmars Boulevard and Waterfront Promenade (Near the Closest Residence to the Proposed Project)	7:49am	20:00	73.5	75.4	74.6	73.4	72.3	62.9
			15:14	73.1	74.8	74.0	73.0	71.9	
		11:19am	20:00	72.2	75.6	73.6	72.0	70.5	61.6
			13:48	71.8	74.4	73.0	71.7	70.3	
		1:35pm	20:00	73.0	77.3	74.2	72.7	71.5	64.1
			16:29	72.4	74.4	73.5	72.4	71.2	
		4:58pm	20:00	72.4	76.1	73.3	72.2	71.3	61.8
			14:53	72.0	73.5	72.8	72.0	71.1	
		7:42pm	20:00	71.5	77.3	72.7	71.1	69.3	63.2
			14:07	70.8	72.9	72.0	70.8	69.2	

Notes: Field Measurements performed by AKRF, Inc. on October 2, 2012 and October 3, 2012.
For each time period, the first measurement was run continuously, while the second measurement was paused for noise associated with LaGuardia Airport.
[1] Pier 1 was locked. Location was moved to the Waterfront Promenade immediately adjacent to Pier 1 entrance gate.
[2] Measurement has no aircraft flyovers.
[3] Calculated by logarithmically subtracting the paused measurement from the 20-min measurement.

CONSTRUCTION NOISE ANALYSIS RESULTS

As explained above, noise monitoring was performed using two sound level meters to remove the noise resulting from aircraft takeoffs over Flushing Bay. The results of the construction analysis both with and without this aircraft noise are discussed below. The maximum noise impacts predicted from either hydraulic or mechanical dredging for the various phases of construction are discussed below. For both options, the maximum predicted incremental noise levels were estimated with Staging Barge 2, located at the edge of the federal navigation channel west of Pier 1.

In addition to the results discussed below, pile driving is also expected to occur for a limited duration at Pier 3 and would be expected to last no more than 6 days under hydraulic dredging or 15 days under mechanical dredging. Pile driving activities alone would result in $L_{eq(1)}$ noise levels that could approach 83 dBA at locations immediately adjacent to these activities. However, due to the limited duration of the pile driving activities, increased noise levels related to such would not result in adverse noise impacts.

Residential Locations

The potential noise impacts at the nearest residence and residential areas were calculated following the methodology described above, and assuming shoreline excavation work, dredging near the shoreline and dewatering would be undertaken concurrently. Considering all the likely construction activities, the maximum predicted incremental noise levels at these locations was 2.2 dBA when there are no aircraft flyovers. If the contractor works 24-hours under the hydraulic option, with less equipment operating, the maximum predicted incremental noise level during the nighttime period was about 1 dBA.

Based on the incremental noise levels predicted at residences for both potential daytime and nighttime from the proposed project, construction of the proposed project would not result in predicted significant adverse noise impacts at the nearest residences or residential locations.

Promenade Locations

For the shoreline embankment work, the greatest noise impacts were calculated at locations adjacent to the promenade. Shoreline embankment work would likely progress on the order of 200 feet of shoreline work completed in a week. When shoreline work is undertaken adjacent to a section of the waterfront promenade, the predicted incremental cumulative noise levels were 10 to 14 dBA above measured levels described above at these locations for a maximum average duration of 14 days. These maximum predicted noise impact levels are considered conservative, since they do not take into account noise reduction measures required by the New York City Noise Control code, which would be specific to the contractor's construction approach. Therefore, these maximum predicted incremental noise levels adjacent to the waterfront promenade related to shoreline embankment work would not be expected to last at any given area along the shoreline for more than a few weeks.

For the dredging activities, the greatest noise impacts were also calculated for locations on the waterfront promenade, when dredging would occur near the shoreline. If the contractor is working a single shift, about 200 feet of linear work along the shoreline would take an average of 10 days, which could vary depending upon whether mechanical or hydraulic dredging is employed. The predicted incremental cumulative noise levels were 10-14 dBA above measured levels described above at these locations for a maximum average duration of approximately 40 days when dredging is undertaken adjacent to a section of the waterfront promenade. These maximum predicted noise impact levels are considered conservative, since they do not take into account noise reduction measures required by the New York City Noise Control code, which

would be specific to the contractor's construction approach. As the dredging activities take place further from the shore, the predicted noise levels in this location would be less than those predicted when the dredging activities are along the waterfront promenade.

The *CEQR Technical Manual* (2012) has established noise exposure guidelines for open space, based on $L_{10(1)}$ noise levels. According to noise measurements at the waterfront promenade, noise levels are currently above the 55 dBA $L_{10(1)}$ open space threshold and would continue to be during construction of the proposed project.

While the predicted increases in $L_{eq(1)}$ noise levels would be more than 3 dBA from construction activities at times, the proposed project would not result in potential significant adverse noise impacts at locations on the promenade due to the temporary and short-term construction period. Furthermore, noise levels would return to current measured levels on the promenade after construction of the proposed project is complete. Waterfront promenade users are transient under existing conditions and would continue to be during construction and therefore, would not be significantly impacted by temporary increases in noise.

Pier 1 Location

At the open space on Pier 1, the maximum calculated incremental cumulative noise levels were predominantly from the dewatering activities which would occur during the period of active dredging, and assuming Staging Barge 2 area is utilized. At the open space on Pier 1 at the waterfront promenade, the predicted incremental cumulative noise levels were 1 to 11 dBA above measured levels described above at this location. There is a large range in the predicted incremental cumulative noise levels at this location, because background noise levels were much higher when aircraft flyovers occur near this location. These predicted incremental cumulative noise levels would be expected while the Staging Barge 2 is utilized while hydraulic dredging activities occur. The duration of these impacts would likely vary depending upon whether one shift or 24-hour hydraulic work is undertaken. Should mechanical dredging be employed, the maximum predicted noise level increases would be well below those noted above at this location.

While the predicted increases in $L_{eq(1)}$ noise levels would be more than 3 dBA from construction activities at times, the proposed project would not result in potential significant adverse noise impacts at the open space on Pier 1 due to the temporary and short-term construction period. Furthermore, noise levels would return to current measured levels at Pier 1 after construction of the proposed project is complete. Pier 1 users are transient under existing conditions and would continue to be during construction and therefore, would not be significantly impacted by temporary increases in noise.

CONSTRUCTION NOISE IMPACTS CONCLUSIONS

Based on the incremental noise levels predicted at residences for both potential daytime and nighttime from the proposed project, construction of the proposed project would not result in predicted significant adverse noise impacts at the nearest residences or residential locations.

As discussed above, peak construction activities would increase $L_{eq(1)}$ noise levels by more than 3 dBA on the waterfront promenade and Pier 1, depending on the location of construction activities and time of day. This would exceed the *CEQR* criteria for permanent increases in noise levels $L_{eq(1)}$ at these locations. Noise levels during peak construction activities alone would range from 69 to 75 dBA. Increases in noise levels of this magnitude would be expected to occur when construction activities are taking place immediately adjacent to the shoreline and at Staging Barge 2. Potential impacts from dewatering activities at Staging Barge 2 were determined as the "worst-case" since dewatering activities would be closer to the public open space area located on Pier 1.

While it is anticipated that construction activities would increase noise levels at receptor sites, based on the magnitude and expected durations of these potential noise increases described above, construction of the proposed project would not result in predicted significant adverse noise impacts.

In addition, the selected contractor would be required to comply with Local Law 113 of 2005 and the revised New York City Noise Control Code. The City's Noise Control Code would require the contractor to develop a Construction Noise Mitigation Plan prior to the start of work. This plan would include noise minimization strategies, methods, procedures and technologies for each piece of equipment or activity performed at the site during construction.

Although increased noise levels from construction activities would occur for temporary and short periods, it is anticipated that the total duration of construction of the proposed project, including mobilization, active construction (dredging), demobilization and wetland restoration would be short in duration (less than 24 months). Increased noise levels would not be a significant adverse public health impact and noise levels would return to current measured levels after construction of the proposed project is complete. In addition, waterfront promenade and Pier 1 users are transient under existing conditions and would continue to be during construction and therefore, would not be significantly impacted by temporary and short-term increases in noise. Therefore, the proposed project would not result in potential significant adverse noise impacts during construction.

CONCLUSION

As discussed previously, construction of the proposed project would be temporary and short-term duration and would include best management practices and measures to ensure no potential significant adverse impacts to natural resources, hazardous materials, energy, transportation, air quality and noise during construction. All construction related activities would be performed in accordance with federal, state and local approvals and regulations. Potential hazardous material impacts associated with construction would be limited through the implementation of a CHASP and the management of dredge materials during construction activities. Potential odor impacts during construction activities would be minimized by the implementation of a CAMP, and application of odor controls, continuous air quality monitoring and enforcement of maximum threshold standards. Potential noise impacts would be minimized through the implementation of a Construction Noise Mitigation Plan that would need to be approved by DEP prior to the start of work. This plan would include noise minimization strategies, methods, procedures and technologies for each piece of equipment or activity performed on-site during construction. Therefore, construction of the proposed project would not result in potential significant adverse impacts to the resources assessed in this document. ✷

ATTACHMENT B

FIGURES AND SITE PHOTOGRAPHS

12.7.12

Project Location
Figure B-1

Flushing Bay Environmental Dredging Project

12.7.12

CSO Outfall BB-006

CSO Outfall BB-008

CSO Outfalls BB-006 and BB-008

12.7.12

BASE MAP SOURCE:NYC Dept. of Information Technology & Telecommunications, 2004
OUTFALL SOURCE: Flushing Bay Waterbody/Watershed Plan, 2011

0 200 400 FEET
SCALE

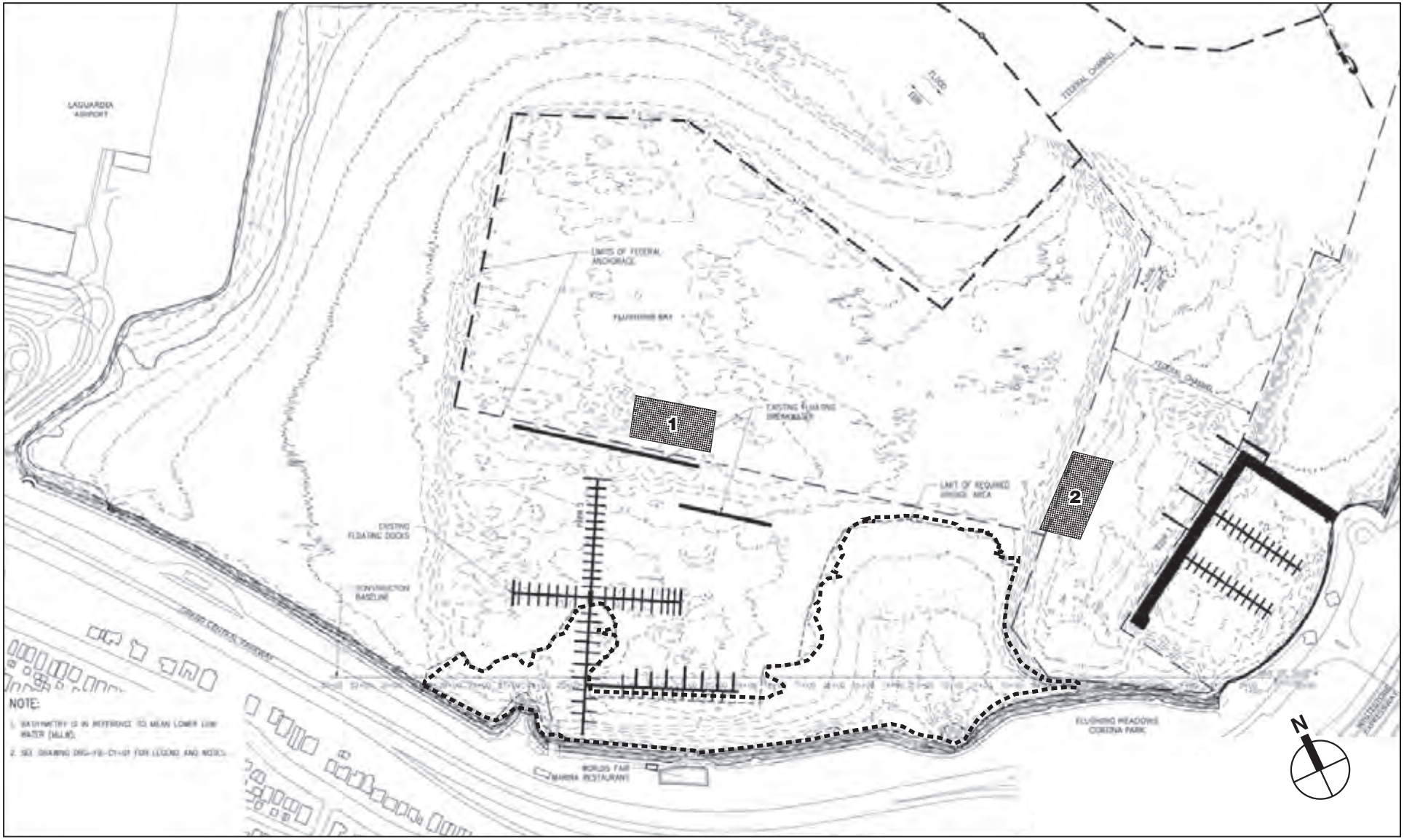
Proposed Dredging LImits

CSO Outfall Locations

Proposed Dredging Area (including access dredging)
Figure B-3

Flushing Bay Environmental Dredging Project

12.7.12

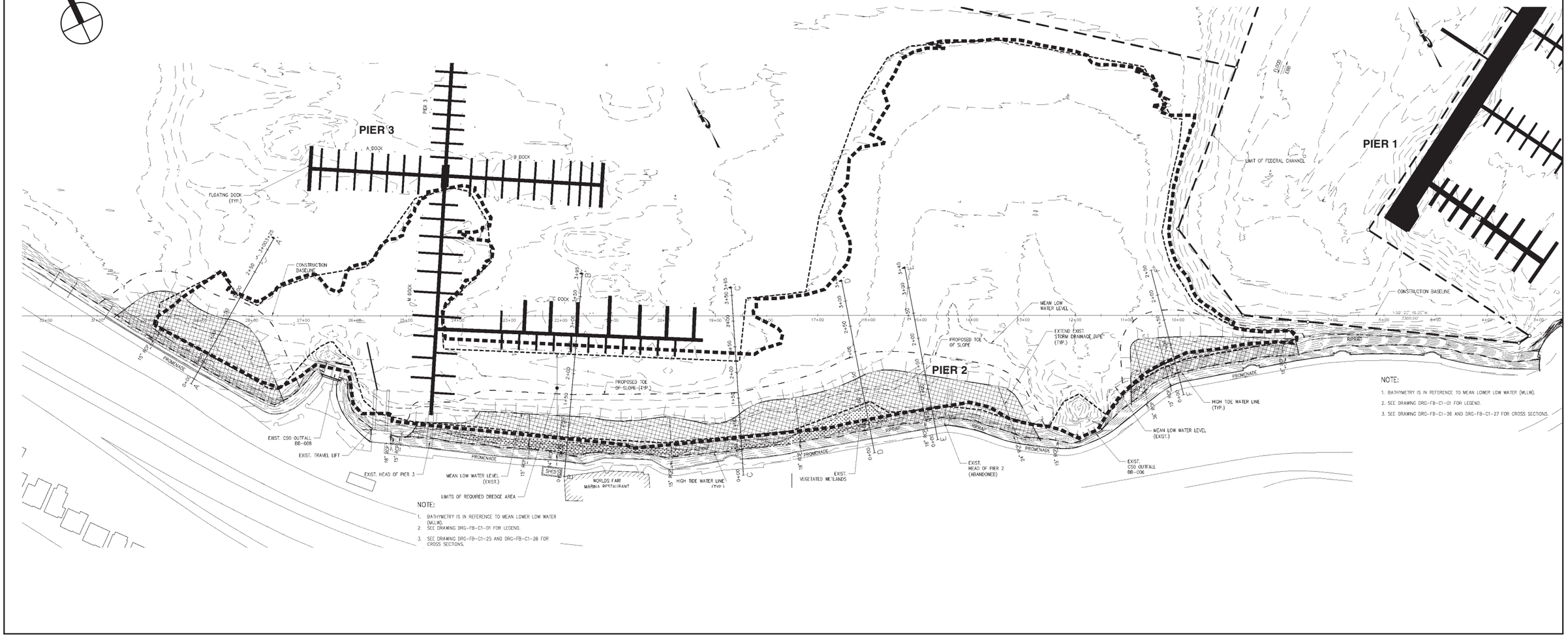


Dredging Area

1 *Temporary Staging Areas*

Site Plan
Figure B-4

Flushing Bay Environmental Dredging Project



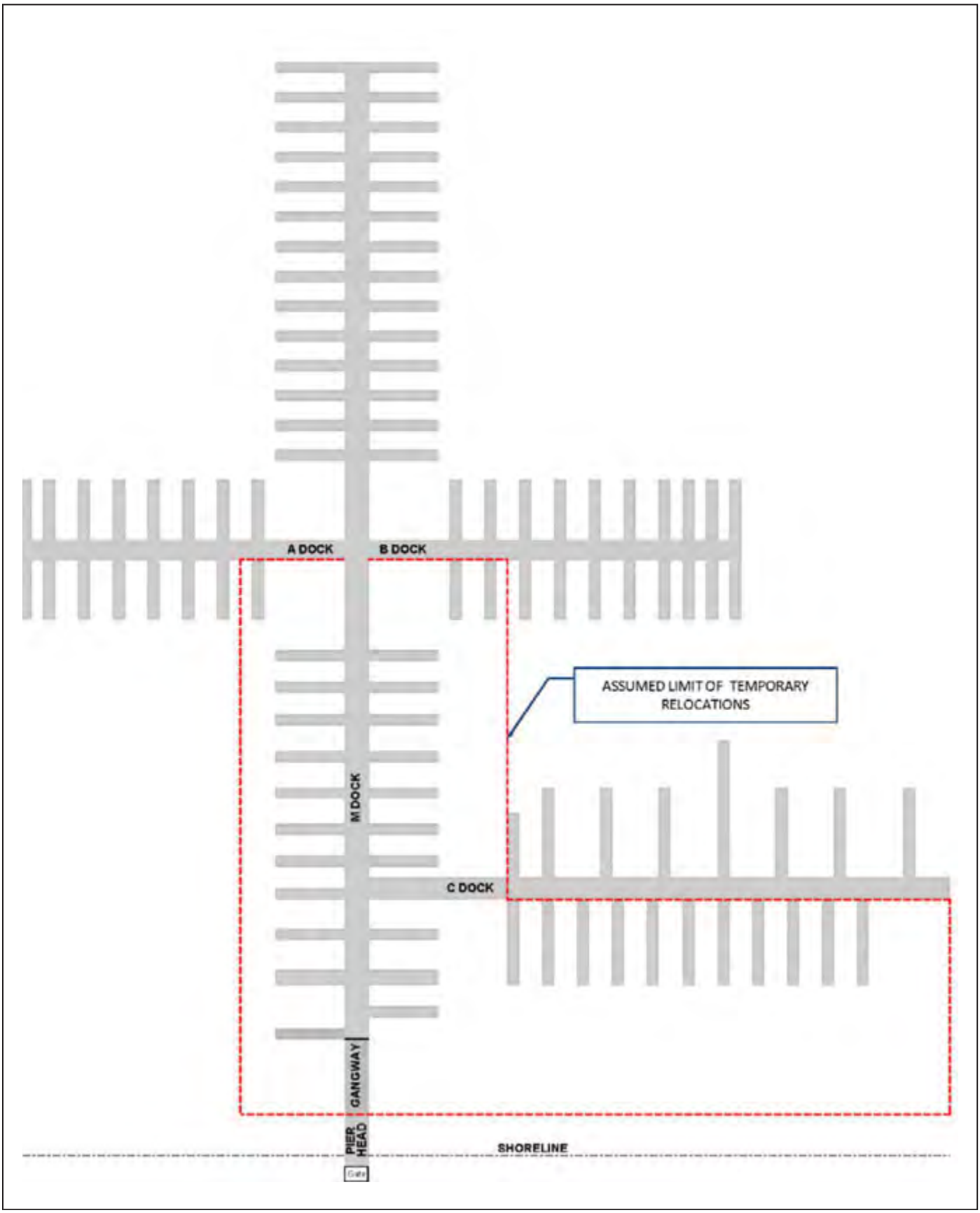
Dredging Limits

Proposed Wetland Retoration Areas

Wetland Restoration Areas
Figure B-5

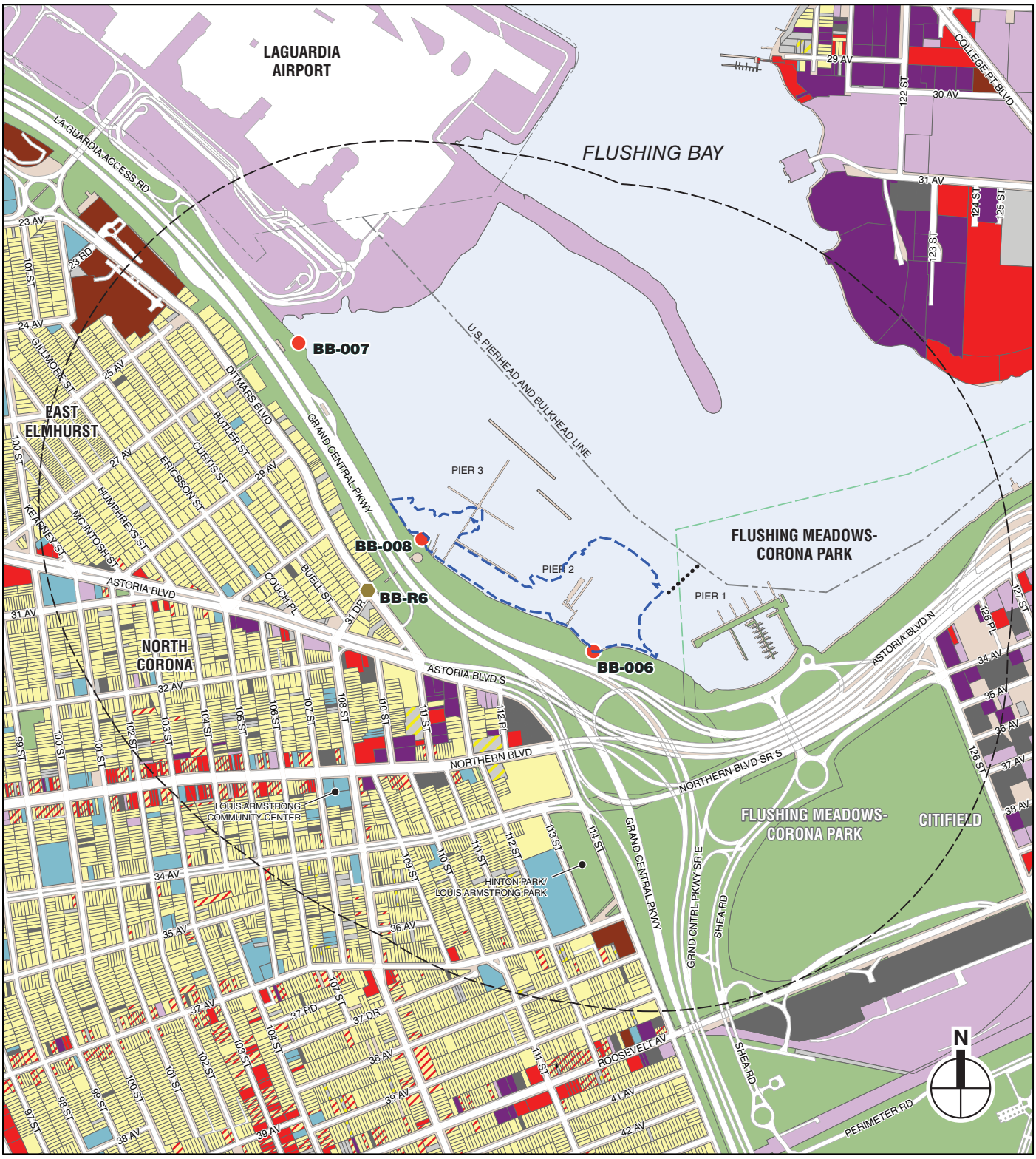
Hydraulic Dredging
Figure B-6

Mechanical Dredging
Figure B-7



Floating Docks at Pier 3 to be Temporarily Relocated

12.7.12



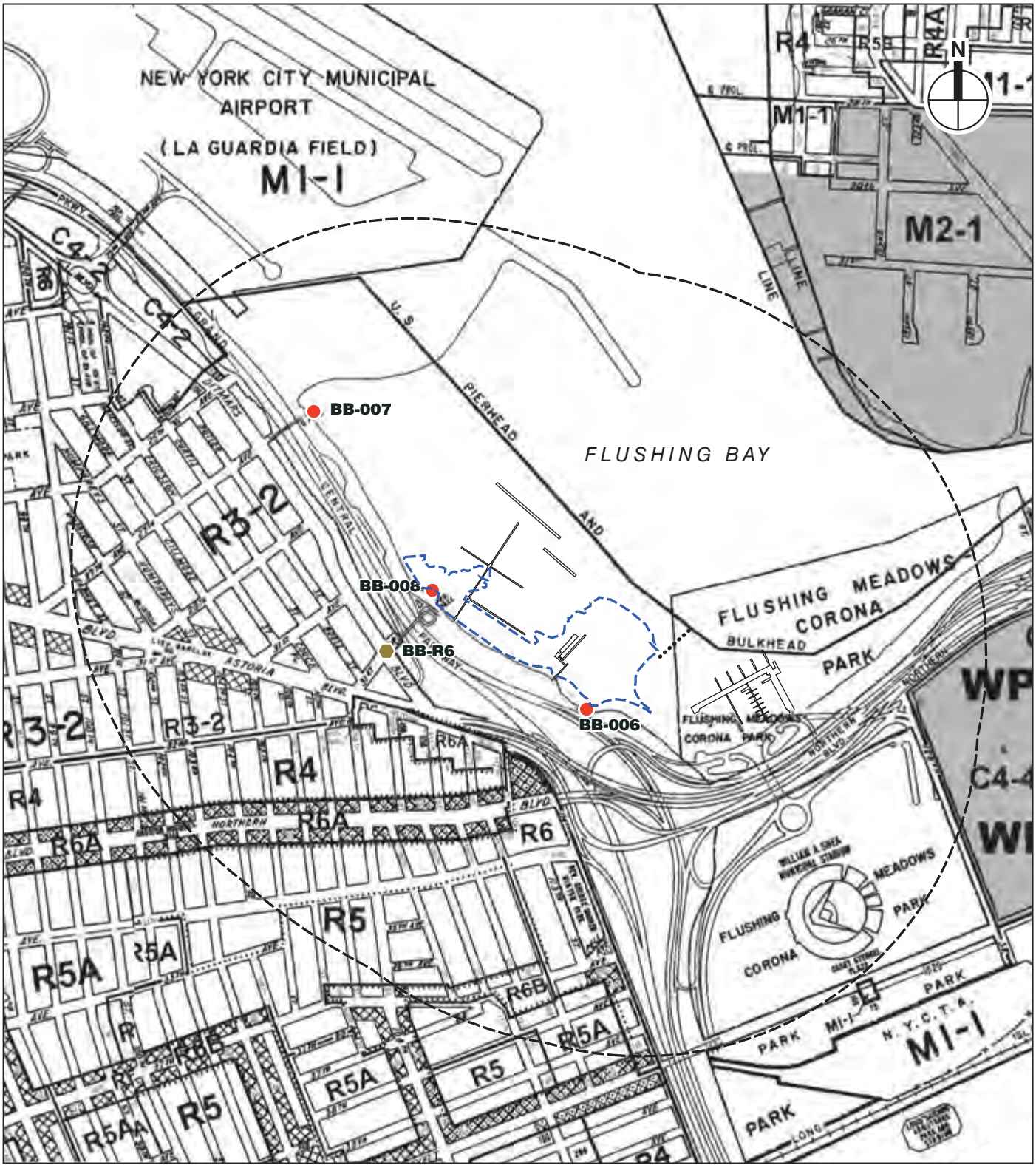
- *Dredging Area*
- *Temporary Staging Area*
- *Outfall*
- *Regulator*
- *1/2-Mile Study Area*
- *Residential*
- *Residential with Commercial Below*
- *Hotels*
- *Commercial and Office Buildings*
- *Industrial and Manufacturing*
- *Transportation and Utility*
- *Public Facilities and Institutions*
- *Open Space and Outdoor Recreation*
- *Parking Facilities*
- *Vacant Land*
- *Vacant Building*
- *Under Construction*

0 500 1000 FEET
SCALE

Flushing Bay Environmental Dredging Project

Study Area Land Use
Figure B-9

12.7.12

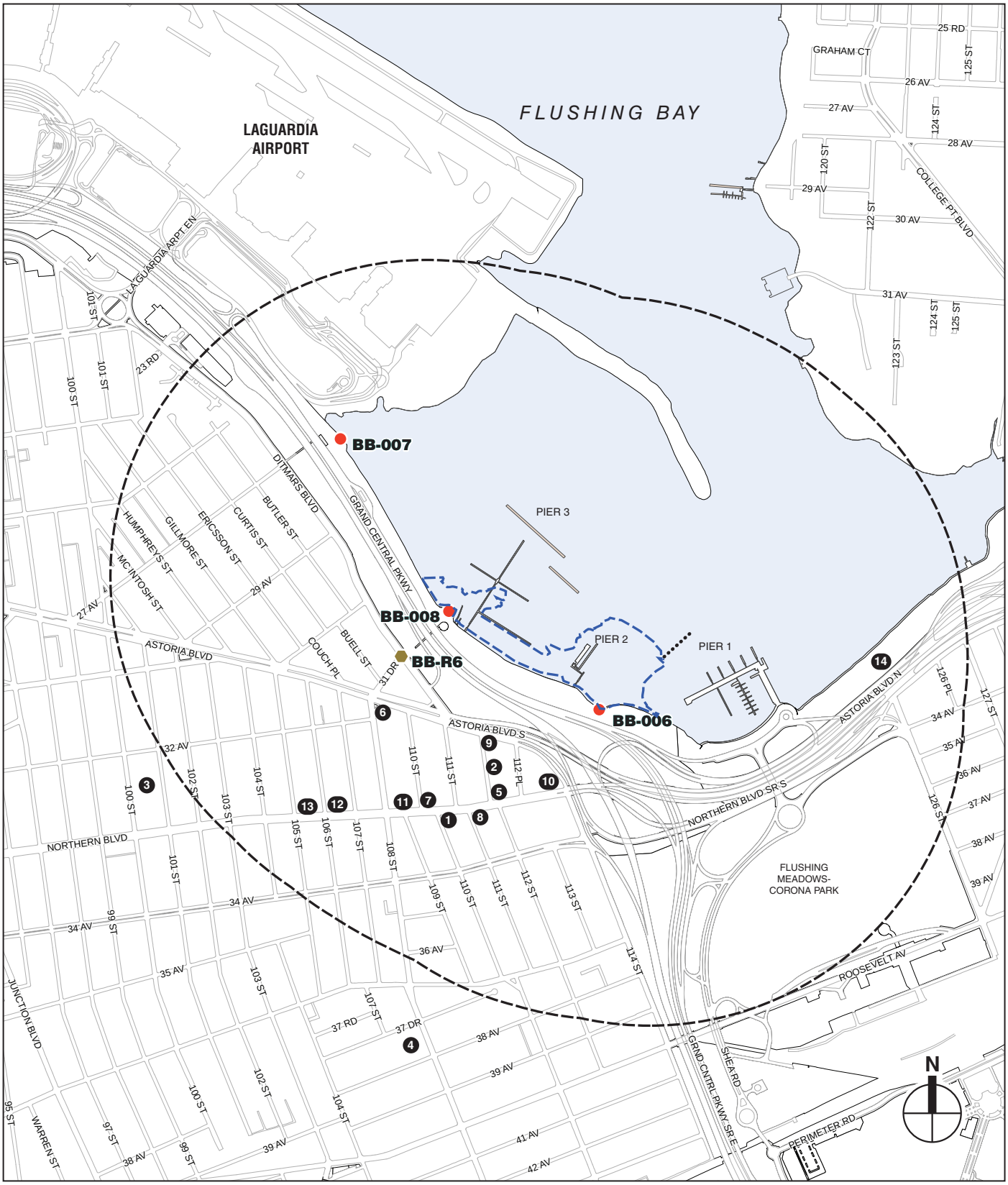


Dredging Area
Temporary Staging Area
Outfall
Regulator
Study Area Boundary
Zoning District Boundary
C1-2 Overlay
C1-4 Overlay
C2-4 Overlay
Special-Purpose District

Flushing Bay Environmental Dredging Project

Zoning
Figure B-10

12.7.12



Dredging Area

Temporary Staging Area

Outfall

Regulator

1/2-Mile Study Area

No Build Project (see Table B-2)

Flushing Bay Environmental Dredging Project

No Build Projects

Figure B-11

Pier 3 Marina **1**

Travel lift launch at Pier 3 **2**

World's Fair Marina Facilities

Figure B-12

Travel lift and upland storage at Pier 3 **3**

Gazebo at World's Fair Marina Restaurant and Banquet hall **4**

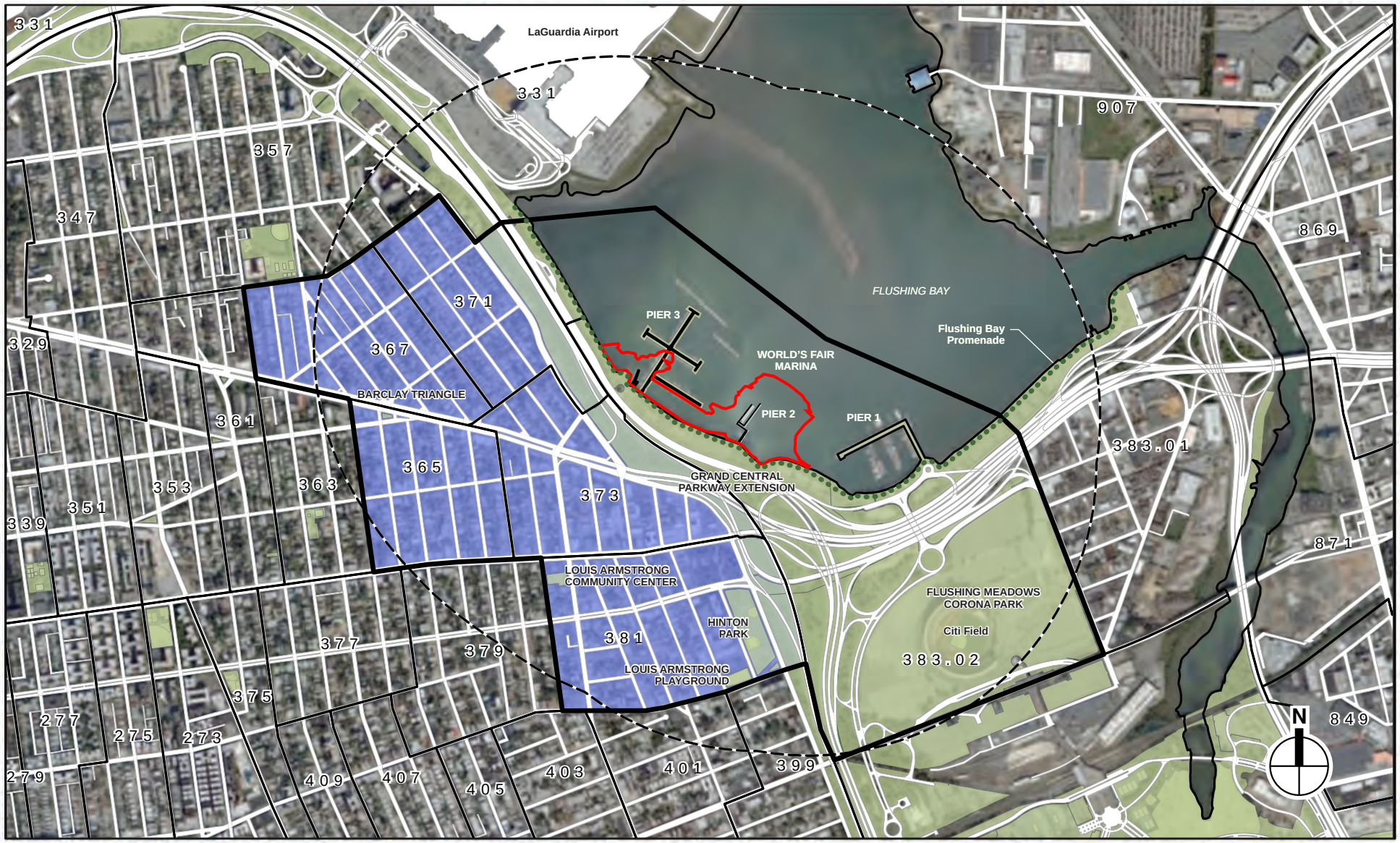
World's Fair Marina Facilities

World's Fair Cafe and fuel dock **5**

Fuel dock and commercial charter boat at Pier 1 **6**

World's Fair Marina Facilities
Figure B-14

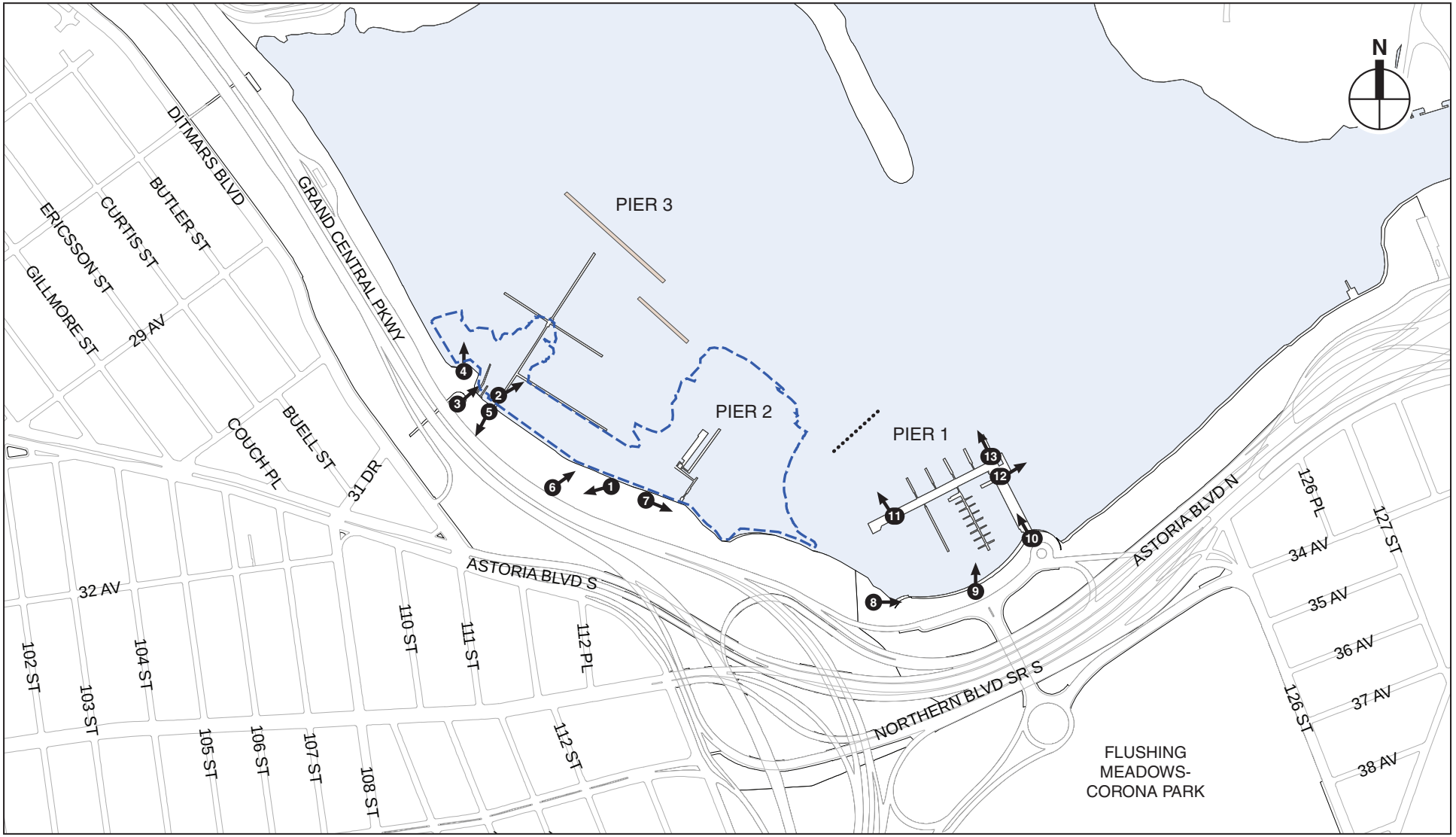
12.7.12



Flushing Bay Environmental Dredging Project

Open Space
Figure B-15

12.7.12



Dredging Area

Photograph View Direction and Reference Number

Photo Location Key
Figure B-16

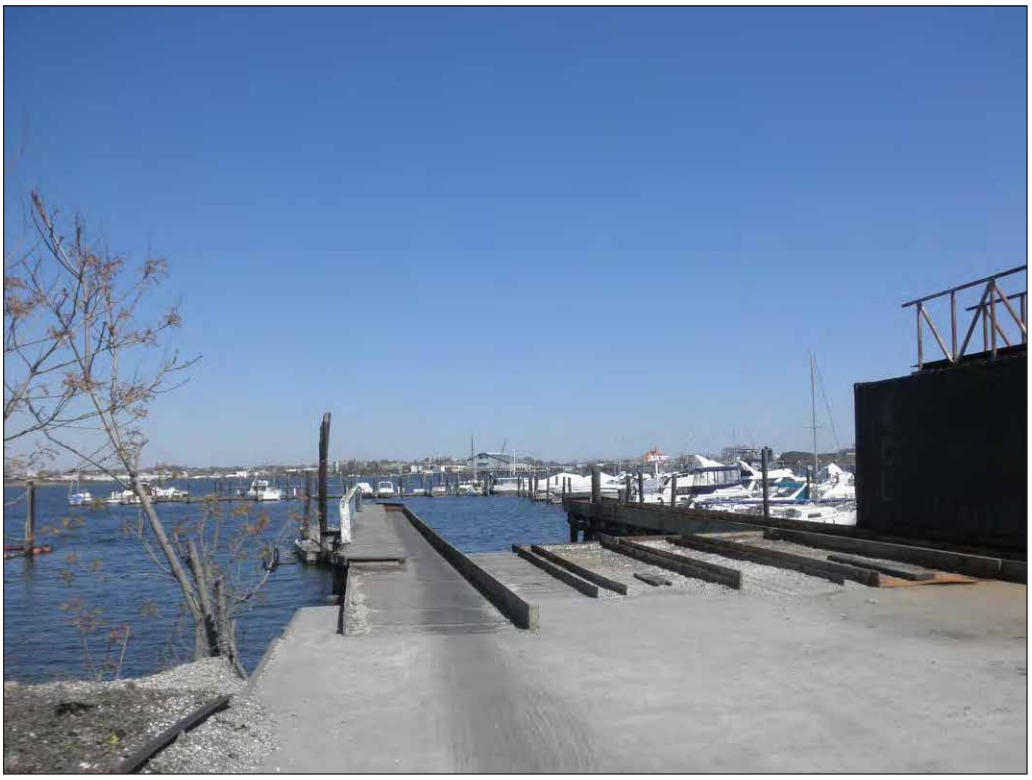
Flushing Bay Environmental Dredging Project

Flushing Meadows-Corona Park on Flushing Bay **1**

Pier 3 **2**

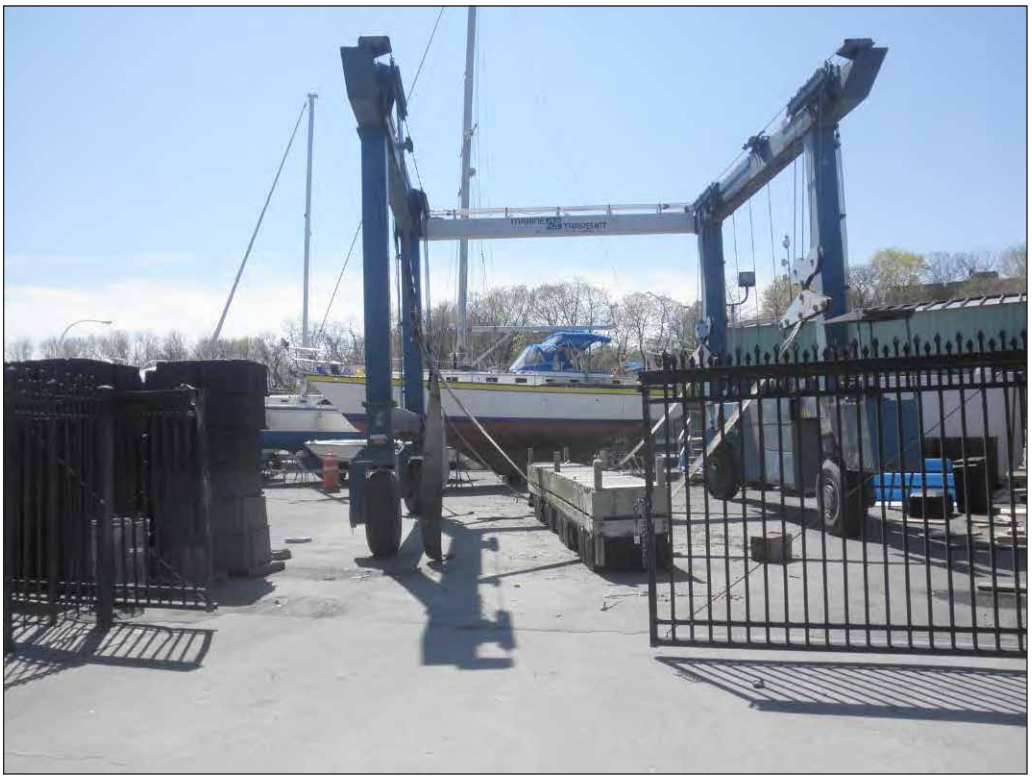
Open Space Photographs

Figure B-17



Boat launch on Pier 3 **3**

The waterfront promenade near western end of study area **4**



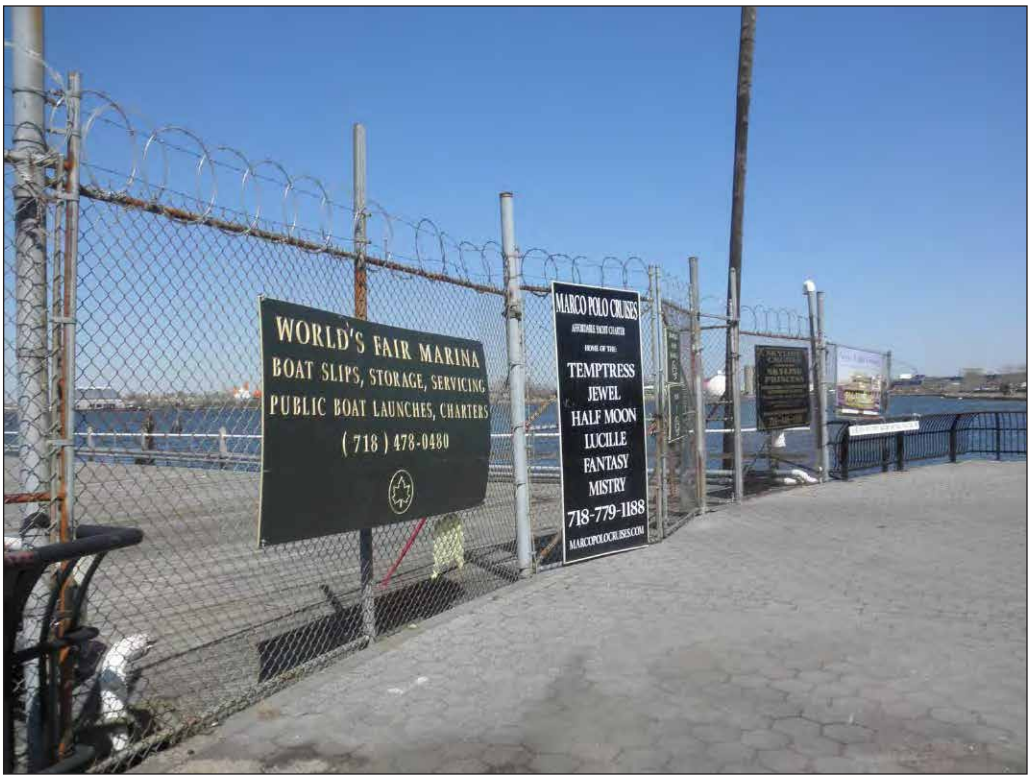
Boat lift at Pier 3 **5**

Gazebo at World's Fair Marina Restaurant and Banquet Hall **6**

Tree-lined Promenade facing east **7**

Candela structures at eastern end of Promenade **8**

Pier 1 **9**



Gate entrance to Pier 1 **10**

Flushing Bay Environmental Dredging Project

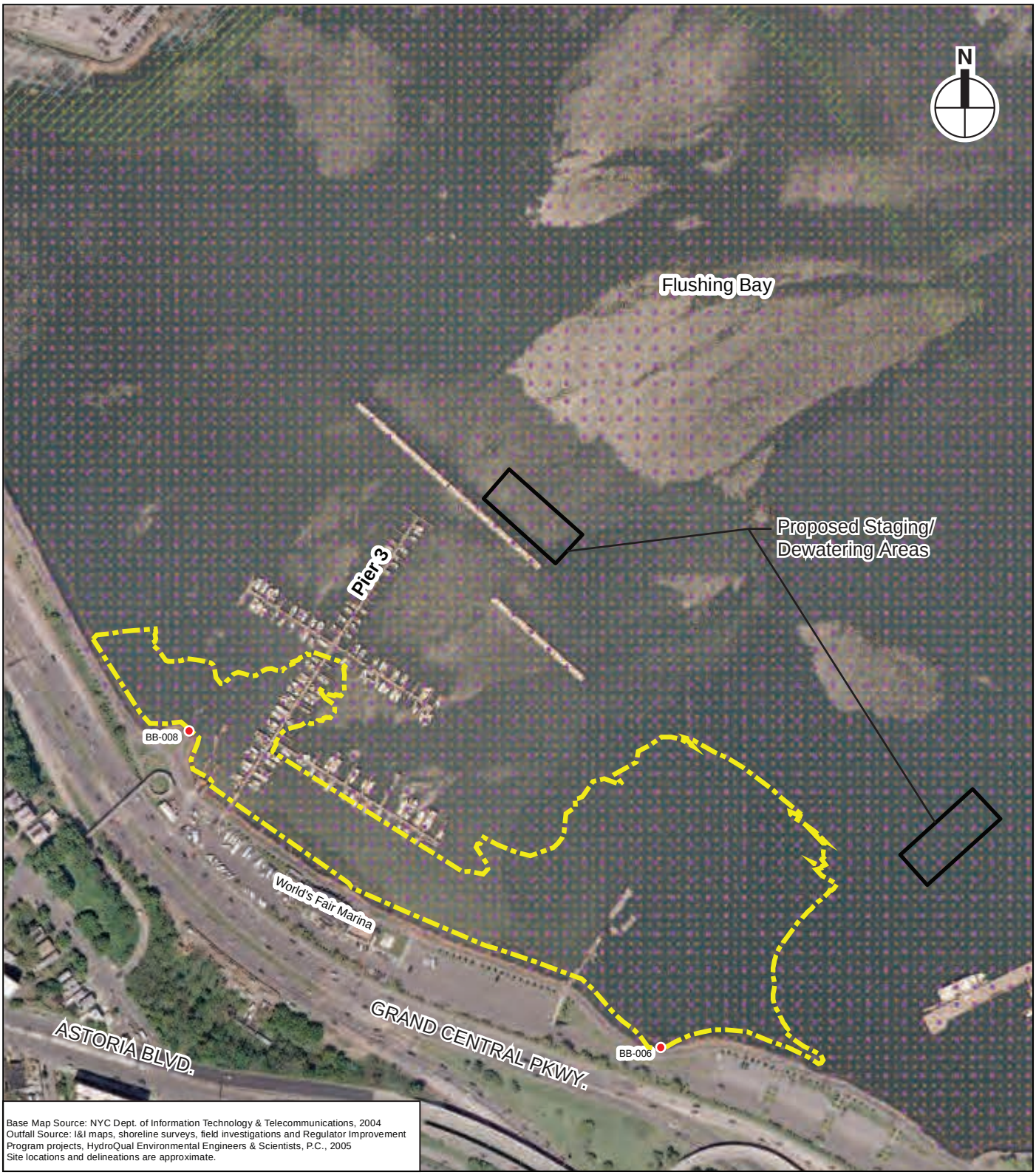
Open Space Photographs
Figure B-21

Fishing area on Pier 1 **11**

World's Fair Cafe and fuel dock at Pier 1 **12**

Fuel dock and charter boat on Pier 1 **13**

12.7.12



Dredging Area

CSO Outfalls

NWI Mapped Wetlands

Estuarine and Marine Deepwater

Estuarine and Marine Wetland

NYSDEC Mapped Wetlands

Intertidal Marshes

Littoral Zone

Flushing Bay Environmental Dredging Project

NYSDEC/NWI Mapped Wetlands

Figure B-24

12.7.12

Base Map Source: NYC Dept. of Information Technology & Telecommunications, 2004
Outfall Source: I&I maps, shoreline surveys, field investigations and Regulator Improvement Program projects, HydroQual Environmental Engineers & Scientists, P.C., 2005
Site locations and delineations are approximate.
Wetland delineation performed December 2011.

0 200 400 FEET
SCALE

Dredging Area

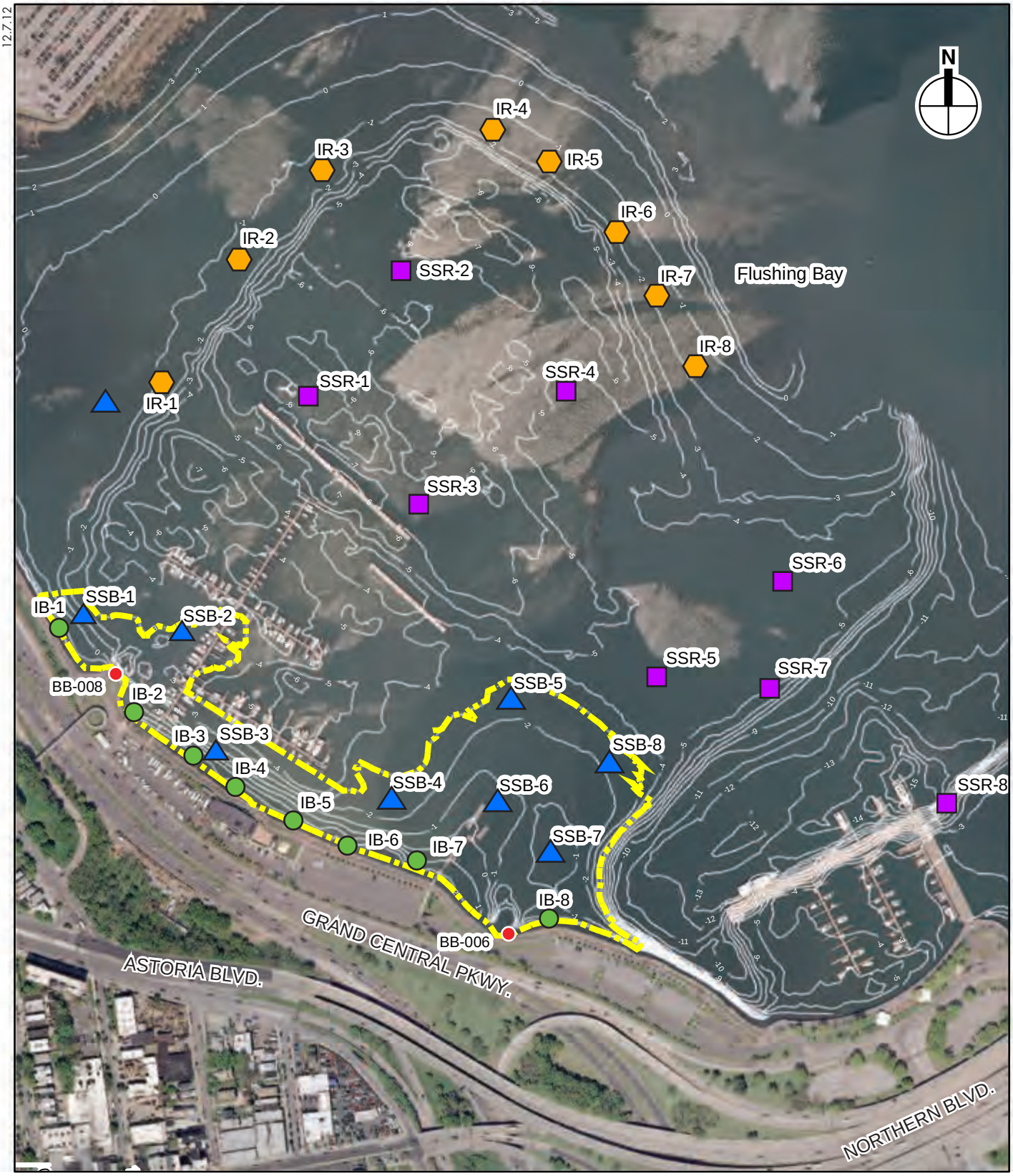
CSO Outfalls

Delineated Wetlands

Flushing Bay Environmental Dredging Project

Delineated Wetlands
Figure B-25

12.7.12



Base Map (c) 2010 Microsoft Corporation and its data suppliers.
Outfall Source: Flushing Bay Waterbody/Watershed Plan, 2011.
Bathymetry: Gahagan and Bryant Associates, 2011.
Station coordinates were recorded during sampling events (6/4/12-6/5/12).

0 200 400 FEET
SCALE

Dredging Area
CSO Outfalls
Reference Benthic Sampling Locations
Shallow Subtidal Benthic Sampling Locations
Reference Intertidal Benthic Sampling Locations
Intertidal Benthic Sampling Locations

Benthic Sampling Locations
Figure B-26

Flushing Bay Environmental Dredging Project

12.7.12

Base Map Source: NYC Dept. of Information Technology & Telecommunications, 2004
Outfall Source: I&I maps, shoreline surveys, field investigations and Regulator Improvement Program projects, HydroQual Environmental Engineers & Scientists, P.C., 2005
Site locations and delineations are approximate.
Tree locations based on field identified GPS points.
Trees shown on figure have a DBH greater than 3 inches.

0 200 400 FEET
SCALE

Dredging Area

CSO Outfalls

Tree Locations

Flushing Bay Environmental Dredging Project

Tree Survey Locations
Figure B-27

12.7.12

Base Map Source: NYC Dept. of Information Technology & Telecommunications, 2004
Outfall Source: I&I maps, shoreline surveys, field investigations and Regulator Improvement Program projects, HydroQual Environmental Engineers & Scientists, P.C., 2005
Site locations and delineations are approximate.

0 400 800 FEET
SCALE

Dredging Area

CSO Outfalls

Reference Benthic Sampling Locations

Flushing Bay Environmental Dredging Project

Bird Survey Observation Locations

Figure B-28

12.7.12

Base Map Source: NYC Dept. of Information Technology & Telecommunications, 2004
Outfall Source: Flushing Bay Waterbody/Watershed Plan, 2011
Sampling locations based on data from field work conducted on April 30-May, 2012

0 200 400 FEET
SCALE

Dredging Area

CSO Outfalls

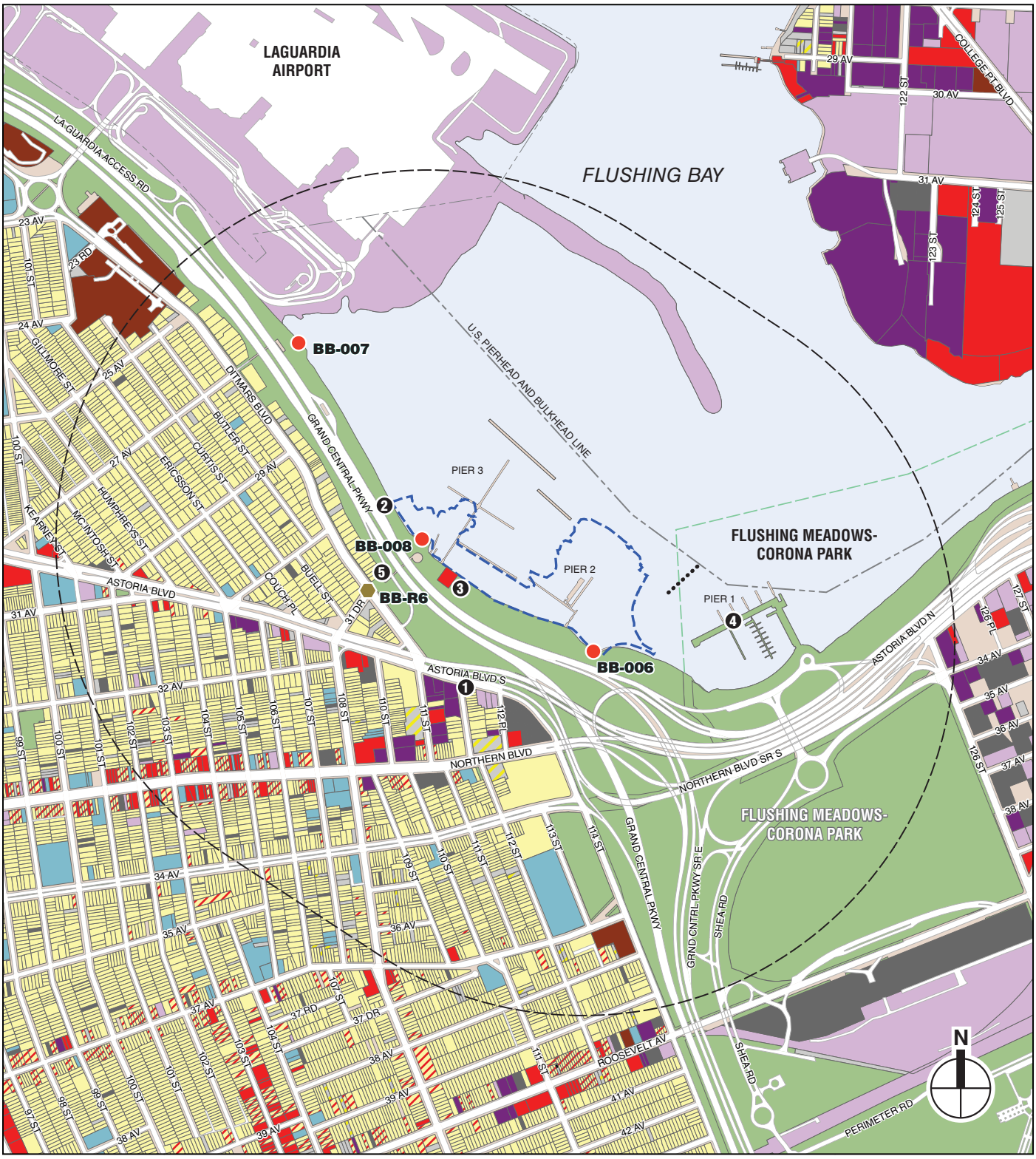
Sediment Sampling Locations

Multi-depth Sediment Sampling Locations

Flushing Bay Environmental Dredging Project

Sediment Sampling Locations
Figure B-29

12.7.12



- Outfall
- Regulator
- 1/2-Mile Perimeter
- Noise Receptor Location
- Proposed Dredging Area
- Proposed Temporary Staging Area
- Residential
- Residential with Commercial Below
- Hotels
- Commercial and Office Buildings
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- Vacant Building
- Under Construction

0 500 1000 FEET
SCALE

Noise Receptor Locations and Study Area Land Use

Figure B-31

Flushing Bay Environmental Dredging Project

ATTACHMENT C

WATERFRONT REVITALIZATION PROGRAM
CONSISTENCY ASSESSMENT FORM

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: Ms. Kathryn Mallon, Deputy Commissioner, NYC Department of Environmental Protection
2. Address: 96-05 Horace Harding Expressway, 4th Floor Low Rise, Corona, NY 11373
3. Telephone: (718) 595-6183 Fax: (718) 595-5999 E-mail: KMallon@nyc.dep.gov
4. Project site owner: City of New York

B. PROPOSED ACTIVITY

1. Brief description of activity:

   The New York City Department of Environmental Protection (DEP) proposes to dredge an area of approximately 16.8 acres in Flushing Bay. The environmental dredging is a requirement of an Administrative Order of Consent between DEP and the New York State Department of Environmental Conservation. Proposed dredging would be to a depth of approximately four feet below mean lower low water and would involve the removal of approximately 85,000 cubic yards. Project would also involve the restoration and/or enhancement of 3.18 acres of tidal wetlands.

2. Purpose of activity:

   To perform environmental dredging to remove accumulated sediment mounds associated with Outfalls BB-006 and BB-008 in Flushing Bay. The proposed project would reduce nuisance odors associated with existing sediment mounts at Outfalls BB-006 and BB-008, improve the aesthetics of Flushing Bay by removing the deteriorated timber piles at Pier 2 and exposed sediment mounds, restore wetlands along the shoreline, and enhance the shoreline habitat.

3. Location of activity: (street address/borough or site description):

   Southern shoreline area of Flushing Bay in Queens, NY. The proposed dredge area would encompass the area in the vicinity of combined sewer overflows (CSO) Outfalls BB-006 and BB-008 along the southern shoreline of Flushing Bay immediately adjacent to the World's Fair Marina.

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:

   USACE: Section 404 (Clean Water Act); Section 10 (Rivers and Harbors Act)
   NYSDEC: Section 401 Water Quality Certification; Protection of Waters; Tidal Wetlands
   NYS Department of State: Federal Consistency Concurrence

5. Is federal or state funding being used to finance the project? If so, please identify the funding source(s).

   Not applicable.

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.

   Not applicable.

C. COASTAL ASSESSMENT

Location Questions:	Yes	No
1. Is the project site on the waterfront or at the water's edge?	✓	
2. Does the proposed project require a waterfront site?	✓	
3. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land underwater, or coastal waters?	✓	

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)		✓
5. Is the project site appropriate for residential or commercial redevelopment? (1.1)		✓
6. Will the action result in a change in scale or character of a neighborhood? (1.2)		✓

Policy Questions cont'd	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)		✓
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)	✓	
31. Would the proposed action have any effects on surface or ground water supplies? (5.4)		✓
32. Would the action result in any activities within a federally designated flood hazard area or state-designated erosion hazards area? (6)	✓	
33. Would the action result in any construction activities that would lead to erosion? (6)		✓
34. Would the action involve construction or reconstruction of a flood or erosion control structure? (6.1)		✓
35. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (6.1)		✓
36. Does the proposed project involve use of public funds for flood prevention or erosion control? (6.2)		✓
37. Would the proposed project affect a non-renewable source of sand ? (6.3)		✓
38. Would the action result in shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants? (7)	✓	
39. Would the action affect any sites that have been used as landfills? (7.1)		✓
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)		✓
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)	✓	
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)		✓
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)	✓	
44. Would the action result in the provision of open space without provision for its maintenance? (8.1)		✓
45. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreational space? (8.2)		✓
46. Will the proposed project impede visual access to coastal lands, waters and open space? (8.3)		✓
47. Does the proposed project involve publicly owned or acquired land that could accommodate waterfront open space or recreation? (8.4)	✓	
48. Does the project site involve lands or waters held in public trust by the state or city? (8.5)	✓	
49. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (9)		✓
50. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (9.1)		✓

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, Deputy Commissioner, DEP

Address: 59-17 Junction Boulevard, 11th Floor, Flushing NY

Telephone (718) 595-4352

Applicant/Agent Signature: [signature] Date: 02/21/12

ATTACHMENT D

ESSENTIAL FISH HABITAT ASSESSMENT

New York City
Department of Environmental Protection

ESSENTIAL FISH HABITAT ASSESSMENT
CITYWIDE DREDGING ENGINEERING
DESIGN CONTRACT SERVICES

ENVIRONMENTAL DREDGING OF
FLUSHING BAY
QUEENS, NEW YORK

WP-169
CONTRACT REG NO. 826 20111402281

Prepared by:

AECOM/HydroQual, a Joint Venture
605 3rd Avenue
New York, NY 10158

December 2012

A Joint Venture

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LIST OF ACRONYMS

CMP	Coastal Management Program
CSO	Combined Sewer Outfall
CY	Cubic Yards
DEP	New York City Department of Environmental Protection
DO	Dissolved Oxygen
DOS	New York State Department of State
EFH	Essential Fish Habitat
HAPC	Habitat Area of Particular Concern
MAFMC	Mid-Atlantic Fishery Management Council
MHW	Mean High Water
MLW	Mean Low Water
MLLW	Mean Lower Low Water
MTS	Marine Transfer Station
NMFS	National Marine Fisheries Service
NWI	National Wetlands Inventory
NOAA	National Oceanic and Atmospheric Association
NYCDPR	New York City Department of Parks & Recreation
NYSDEC	New York State Department of Environmental Conservation
PSU	Practical Salinity Units
SOD	Sediment Oxygen Demand
USACE	United States Army Corps of Engineers
USDOC	United States Department of Commerce
USEPA	United State Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
YOY	Young-of-Year

1.0 INTRODUCTION

The New York City Department of Environmental Protection (DEP) is required to conduct environmental dredging at several tributaries within the City of New York to remove combined sewer overflow (CSO) mounds that contribute to nuisance odors and aesthetic impacts within these waterbodies. This is required by an Administrative Order on Consent between the DEP and the New York State Department of Environmental Conservation (NYSDEC), otherwise identified as NYSDEC Case #CO2-20110512-25 (also known as the CSO Consent Order). As part of the Consent Order, the DEP is required to prepare Waterbody/Watershed Plans for several CSO-impacted tributaries. These Waterbody/Watershed Plans lay out the specific actions to be undertaken to address CSO issues and improve water quality in each waterbody and a schedule for the implementation of these actions.

In Flushing Bay, the impacts of more than a century of watershed urbanization have resulted in the continuing deposition of organic and inorganic sediments, which contribute to sediment oxygen demand and have impaired aquatic habitat and recreational uses of the waterbody. In addition, hypoxic and anoxic conditions can result in the production of hydrogen sulfide, leading to odors (DEP, 2011b). One factor contributing to the buildup of these sediment mounds are CSOs. The proposed dredging and other habitat improvements in Flushing Bay would remove exposed sediments and their associated odors, and improve the visual aesthetics and recreational uses of the waterbody.

This report provides an Essential Fish Habitat (EFH) Assessment for Flushing Bay with a focus on the proposed dredging activities in the southern portion of the Bay (Figure 1-1). In compliance with the Magnuson-Stevens Fishery Conservation and Management Act, as amended in 1996 by the Sustainable Fisheries Act, a consultation with the National Marine Fisheries Service (NMFS) is required for federally permitted activities that may impact EFH. EFH consists of the waters and substrate that are required by fish for spawning, breeding, feeding or growth to maturity. This assessment includes an evaluation of impacts on those species and life stages for which a designated EFH has been identified in the project area as well as for certain species of concern, forage fish, and for striped bass, a non EFH-managed species with commercial and recreational importance.

Base Map Source: NYC Dept. of Information Technology & Telecommunications, 2004
Outfall Source: Flushing Bay Waterbody/Watershed Plan, 2011
Site delineations are approximate.

0 250 500 1,000 1,500 Feet

NYC Environmental Protection

Capital Project WP-169
Citywide Dredging Engineering Design Contract Services
Contract CSO - DRDG
Flushing Bay

Figure 1-1

Project Site

2.0 PROJECT DESCRIPTION

Since the 1980's there have been efforts to abate the unpleasant odors originating from Flushing Bay. In the summer of 1984, DEP operated an odor hotline that mobilized a field crew to the location of a complaint to identify and quantify the odor-causing substances. Based on the collected data, it was concluded that the odors were caused by H_2S in the exposed sediments in Flushing Bay and Creek. The final recommendation of the *Flushing Bay and Creek Odor Abatement Feasibility Study* (H2M, 1984) was to dredge at three sites (two in Flushing Bay) to remove mudflats that were exposed at low tides.

In 2011, the DEP submitted the *Flushing Bay Waterbody/Watershed Facility Planning Report* (DEP, 2011b) as part of its City-Wide Long-Term CSO Control Plan project in response to the CSO Consent Order. This plan lays out a series of improvements and actions to achieve compliance with NYSDEC water quality standards. Specific objectives of the plan include eliminating odors, reducing floatables, and improving dissolved oxygen (DO) concentrations to improve surface water quality. Among DEP's planned improvements for Flushing Bay are the following four components:

- Regulator and sewer modifications to reduce CSO.
- Dredging of Flushing Bay.
- Continued implementation of programmatic controls.
- Upgrades to the Bowery Bay Wastewater Treatment Plant.

The 2011 Waterbody/Watershed Plan for Flushing Bay proposed dredging to improve aesthetics and to reduce odors in the vicinity of the Bay. Currently proposed dredging would be completed to a depth of four feet below mean lower low water (MLLW) through the removal of approximately 85,000 cubic yards (cy) from approximately 17 acres of Flushing Bay. Proposed dredging would also include an allowable overdredge of 1.0 feet that may result in final water depths that are 5.0 feet below MLLW. A sand cap is not proposed for this waterbody due to its location within an active marina, the potential to restore or expand these uses in the future, and also because the characteristics of the sediments to be exposed after proposed dredging are comparable to current sediment quality.

Three DEP CSO outfalls located along the southern and western shoreline of Flushing Bay discharge at or in close proximity to the proposed dredging area (Figure 1-1). CSOs BB-006 and BB-008 are located within the proposed project area. CSO BB-007 is located at the southwestern corner of the project area, west of the currently proposed dredging area. The dredging will also occur within the limits of the World's Fair Marina, an active waterfront use, and adjacent to an existing waterfront promenade. Existing water depths within the proposed dredging area are shallow and in some locations CSO sediments are exposed at low tide. The proposed dredging would therefore, at a minimum, seek to eliminate exposed CSO sediment mounds and, in conjunction with other proposed measures will improve the aesthetic conditions of Flushing Bay by removing the mounds from sight and reducing the odors that are associated with them.

DEP is now advancing the engineering design, environmental review and permitting efforts necessary for the proposed project. The currently proposed dredging area is shown in Figure 1-1. The proposed dredging area encompasses approximately 16.8 acres and will be completed using hydraulic and/or mechanical means as necessary.

3.0 EXISTING CONDITIONS

3.1 Physical Site Description

Flushing Bay is generally bounded by the East River to the north, LaGuardia Airport to the west, the community of College Point, Queens to the east, and Willets Point, Queens and the Grand Central Parkway to the south. It encompasses all of the water south of the East River to the mouth of Flushing Creek (DEP, 2011b). Dominant land uses along the eastern shore include commercial and industrial uses with residential land uses further inland. The southern shore is mostly open space used for outdoor recreation (e.g., World's Fair Marina and Flushing Meadows-Corona Park) and to the west and northwest are transportation-related land uses primarily associated with LaGuardia Airport and the Grand Central Parkway with residential uses located beyond the parkway. Several marinas are located along the southern and western shorelines of Flushing Bay including the World's Fair Marina which is located immediately adjacent to and within portions of the proposed project area. The shoreline of Flushing Bay is altered and is dominated by riprap and piers in the vicinity of the proposed project area.

Prior to the late 1870's, three tributaries discharged into Flushing Bay: one tributary from the southwestern corner of the bay in the vicinity of present day LaGuardia Airport, a second tributary from the area eventually occupied by Flushing Airport and a third tributary from Flushing Creek, which entered the Bay from the south. Navigation improvements to Flushing Bay that were designed to encourage and support existing and future needs for industrial, commercial and recreational activities were first authorized by the Rivers and Harbors Act of 1878. During this time, a six-foot navigation channel was constructed extending from deep water in the East River inland to Flushing Creek in the area of the present-day Whitestone Expressway Bridge crossing. Concurrent with the development of deep navigation in Flushing Bay, the adjacent shoreline became heavily developed with ash disposal, construction, petroleum, coal, asphalt, gravel and stone industries. Between 1880 and 1889, a 4,663 foot dike with an elevation equal to mean high water (MHW) was constructed parallel and adjacent to the navigation channel to prevent shoaling and sediment transport from the Bay into the navigation channel (USACE, 1996). Additional excavation and dredging of the channel or repairs to the dike occurred between 1911 and 1962. In 1963, an approximately 2,800 foot long earthen breakwater was constructed with a top elevation of 17 feet at mean low water (MLW) and a width of 30 feet off the eastern corner of LaGuardia Airport (USACE, 1996). The last significant dredging efforts conducted in Flushing Bay were completed by the Corps of Engineers in 1988, 1992 and 1997 within the Bay or at the mouth of Flushing Creek.

Throughout the early decades of the 1900's, natural wetlands in the vicinity of Flushing Bay were filled to accommodate the expansion of water-dependent industrial, commercial and recreational land uses with waterfront access for shipping and boating. The State and City of New York also performed extensive land filling and construction in areas adjacent to Flushing

Bay as part of the construction and expansion of LaGuardia Airport and in preparation of the site for the 1939 and 1964 World's Fairs. Present day LaGuardia Airport extends into the northwestern portion of Flushing Bay. The original North Beach Airport constructed on 50 acres of landfill in 1929 was bought by the City and renamed LaGuardia Airport in 1935, and through a series of runway extensions and filling of wetlands, was subsequently expanded to over 650 acres between 1935 and 1995 (DEP, 2011b). Finally, part of the World's Fair Marina, constructed in conjunction with the 1939 World's Fair, is situated along the southern edge of Flushing Bay and is comprised of a set of floating docks used for mooring recreational vessels and an associated upland esplanade.

Flushing Bay experiences a semi-diurnal tidal cycle with a vertical tidal range of approximately 6.8 feet. Significant portions of the inner bay along the western and southern shorelines are within the intertidal zone at MLLW and are exposed during low water conditions. Based on available sediment data, both historical and recent, there is considerable variability in sediment characteristics throughout Flushing Bay as a whole. Sediment sampling conducted during 2012 in support of permitting for the proposed dredging activities included a grain size analysis on 20 samples that were collected within the proposed project area. The sampling results indicated that the proposed dredge area is comprised mostly of fine particulate matter, dominated by fine to medium sand, soft silt, clay and organic material.

3.2 Habitat Characteristics

Flushing Bay is located within a 10-minute quadrant, as defined by NOAA, which includes EFH for Atlantic Ocean waters within the Hudson River Estuary including Flushing Bay. The water depths within the proposed project area are shallow, less than seven feet at MLLW with areas in the vicinity of existing outfall locations exposed at low tide. Review of NYSDEC tidal wetland maps indicates that the proposed project area is within designated littoral zone wetlands which include all land under tidal waters shallower than six feet at MLW; NYSDEC-designated mudflats also exist within the proposed project area. The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps classify Flushing Bay as an "estuarine, subtidal, open water, excavated" waterbody.

The NYSDEC classifies Flushing Bay as Class I – saline surface waters. This classification indicates a best usage for fish, shellfish and wildlife propagation and survival. The DEP Harbor Survey Program maintains two water quality data stations within Flushing Bay. Station E15 is located nearest to the proposed project area, in the southeastern portion of the Bay. Station FB1 is located near the entrance to Flushing Bay, adjacent to LaGuardia Airport, and north of the existing breakwater. Based on 2011 data for station E15, average salinity levels were 21.68 and 22.25 practical salinity units (psu) for surface and bottom waters, respectively. Average water temperatures were 18.81 degrees Celsius (°C) for surface waters, and 18.41°C for bottom waters. Dissolved oxygen (DO) levels for surface and bottom waters averaged 6.37 and 5.88 milligrams per liter (mg/L), respectively. Table 3-1 provides means and ranges for these water quality parameters at both stations E15 and FB1.

Table 3-1. Means and Ranges for Selected Water Quality Parameters Flushing Bay at Stations E4 and DEP New York Harbor Survey Program, 2011

Location	Stratum	Salinity (psu)		Temperature (°C)		Dissolved Oxygen (mg/L)	
		Mean	Range	Mean	Range	Mean	Range
E15	Surface	21.68	18.1-25.01	18.91	1.21-25.11	6.37	3.2-13.34
	Bottom	22.25	19.44-25.01	18.41	1.22-24.04	5.88	2.76-13.47
FB1	Surface	21.73	14.72-25.03	19.01	1.82-25.19	6.42	2.71-13.25
	Bottom	22.63	19.11-25.14	18.12	1.12-23.66	5.58	3.17-13.16

3.3 Benthic Habitat

A review of historic benthic data indicated that during a study performed in 1995, Flushing Bay had high numbers of pollutant-tolerant species, which suggests that the habitat is generally of poor quality. The benthic invertebrate community was dominated by annelid worms (polychaetes and oligochaetes) and amphipods. Polychaete species included the species *Streblospio benedicti and Leitoscoloplos sp.* which are known to be pollutant-tolerant. *S. benedicti* is also often found in sediments associated with high organic matter, petroleum, sewage and low oxygen levels (NEA, 2002a).

Additionally benthic samples were taken from Flushing Bay in 2002 as part of the USACE Flushing Bay and Creek Ecological Restoration Project. These samples were dominated by Nematoda (roundworms) and Oligochaeta (aquatic earthworms). Annelids were the most abundant phyla followed by arthropods. The taxonomic dominance of annelids, the occurrence of nematode worms in most samples and the lack of amphipods in a majority of these samples indicated that the benthic habitat within Flushing Bay was polluted and habitat quality was generally poor (NEA, 2002a).

More recently, results from the June 2012 intertidal and subtidal benthic sampling program (DEP, 2012b) have indicated that the benthic community within Flushing Bay consists primarily of opportunistic species that are more tolerant to pollution, supporting the conclusion that habitats are degraded and may not be able to support the species assemblages typically found in other, healthy estuarine environments. This primary conclusion is supported by the results of the 2012 sampling program which found a lack of pollution sensitive species (only the common razor clam was collected and in just one sample) and the same predominance of pollution tolerant species including aquatic earthworms Oligochaeta (12% of the total 2012 collection), *Streblospio benedicti* (8% of the total), and Capitellidae (23% of the total). The latter taxon is a family of thread worms known to be particularly tolerant of polluted and stressed conditions in harbors and bays, and is often the first benthic invertebrate to re-colonize an area that has been impacted (Weiss, 1995). In addition, sampling of both intertidal and shallow subtidal habitats showed that even within the inner bay itself, benthic habitat conditions may

vary significantly with more degraded habitats existing within the areas to be dredged in comparison to corresponding reference areas just beyond the immediate project area.

These findings are significant because benthic invertebrates living in or on the available substrate are a critical component of the estuarine food web and represent a primary food source for larvae and juveniles of most EFH species. If benthic conditions are poor then it is likely that existing EFH may also be similarly degraded and provide little value in its current condition.

4.0 ESSENTIAL FISH HABITAT ASSESSMENT

4.1 EFH-Designated Species

EFH has been designated for the various life stages of 17 managed species in the vicinity of the project area based upon the NMFS 10 x 10 minute quadrant area that encompasses Flushing Bay (Table 4-1). For each species and designated life stage listed in Table 4-1, an EFH analysis of the potential project impacts was conducted. Potential direct, indirect and cumulative impacts were assessed in terms of the seasonal distribution, relative abundance, and habitat requirements of each species within the proposed project area.

Table 4-1. Species and Life Stages of EFH-Designated Species within the Flushing Bay Project Area

Species	Life Stages				
	Eggs	**Larvae**	**Juveniles**	**Adults**	**Neonate**
Atlantic Butterfish *(Peprilus triacanthus)*		**X**	**X**	**X**	
Atlantic Mackerel *(Scomber scombrus)*			X	X	
Atlantic Sea Herring *(Clupea harengus)*		X	X	X	
Black Sea Bass *(Centropristus striata)*			**X**	**X**	
Bluefish *(Pomatomus salatrix)*			**X**	**X**	
Cobia *(Rachycentron canadum)*	X	X	X	X	
King Mackerel *(Scomberomorus cavalla)*	X	X	X	X	
Pollock *(Pollachius virens)*			X	X	
Red Hake *(Urophycis chuss)*		**X**	**X**	**X**	
Scup *(Stenotomus chrysops)*	**X**	**X**	**X**	**X**	
Spanish Mackerel *(Scomberomorus maculatus)*	X	X	X	X	
Summer Flounder *(Paralicthys dentatus)*		X	**X**	**X**	
Windowpane Flounder *(Scopthalmus aquosus)*	**X**	**X**	**X**	**X**	
Winter Flounder *(Pseudopleuronectes americanus)*	**X**	**X**	**X**	**X**	
Sand Tiger Shark *(Odontaspis taurus)*					X
Dusky Shark *(Carcharhinus obscurus)*					X
Sandbar Shark *(Carcharhinus plumbeus)*				X	X

Note: Species and life stages that appear in bold may occur, at least seasonally, within the proposed project area.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" found at: http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40407350.html

Among the 17 species for which EFH has been designated within the proposed project area, eight species (Atlantic butterfish, black sea bass, bluefish, red hake, scup, summer flounder, winter flounder, and windowpane flounder) have the potential to occur at least seasonally in the inner Flushing Bay while the remaining species would not be expected to occur or would be much less abundant based on their life history requirements. Potential impacts of the proposed dredging project would therefore be primarily limited to a small number of species and life stages (highlighted in bold on Table 4-1) that may be expected to occur and utilize the proposed project area within inner Flushing Bay.

Atlantic Butterfish

Flushing Bay is designated EFH for larvae, juvenile and adult Atlantic butterfish (*Peprilus triacanthus*). Atlantic butterfish is a pelagic species that ranges from Nova Scotia to Florida. Spawning typically occurs over the continental shelf between May and October, although some eggs and larvae have been collected in larger coastal and estuarine systems (Able and Fahay, 2010). Atlantic butterfish, most likely juveniles, were collected within Flushing Bay during DEP sampling efforts undertaken in 1986 and 2001 (NEA, 2002b).

During summer, Atlantic butterfish move northward and inshore to feed and spawn, then move southward and offshore to warmer waters during winter. Inshore EFH for this species is typically the mixing and/or seawater portions of estuaries (Cross et al., 1999). Butterfish are typically found over sand, mud and mixed substrates in water temperatures of 4.4 to 29.7°C. Larvae are typically observed in depths of 10-120 meters and would not likely utilize the shallow habitat within the proposed project area. Juvenile and adults are typically found in depths of 3-23 meters deep, with salinities between 19 and 32 psu.

Because Atlantic butterfish is predominately a pelagic species occurring in higher salinities and at greater depths than typically found within Flushing Bay, minimal direct and indirect impacts are anticipated to this species within the project area. Adults and juveniles that may be present within Flushing Bay would likely avoid the proposed project area as the depths are shallow. Individuals would be able to find more suitable water depths nearby within the Bay or the East River and avoid the short-term construction impacts.

Atlantic Mackerel

Flushing Bay is designated EFH for juvenile and adult Atlantic mackerel (*Scomber scombrus*). Atlantic mackerel are pelagic; they are widely distributed across the western Atlantic continental shelf and seasonally within estuaries and bays of the mid-Atlantic Bight (Able and Fahay, 2010). Juveniles and adults are typically found in depths up to 350 and 415 meters, respectively. Juveniles prefer salinities of 26.1 to 28.9 psu, and DO from 7.3 to 8.0 mg/L. Adults prefer water temperatures between 6 and 16°C. Because of these habitat requirements (Studholme et al., 1999) and the existing environmental conditions within Flushing Bay, Atlantic mackerel is not expected to be common within the immediate proposed project area and therefore minimal direct or indirect impacts are anticipated.

Atlantic Sea Herring

Designated EFH for larvae, juvenile and adult Atlantic sea herring (*Clupea harengus*) exists within Flushing Bay. This species typically overwinters in the New York Bight between December and April and then moves north during the spring and summer. Adults in the Hudson-Raritan Estuary were found in greatest abundance at temperatures of 3 to 6°C and depths of 4.5 to 13.5 meters (Reid et al., 1999). Larvae are observed at depths ranging from 50 to 90 meters, with temperatures below 16°C and at a salinity of approximately 32 psu (Reid et al., 1999). Larvae would not be expected in the shallow depths of the Bay. Juveniles and adults prefer depths of 15 to 135 meters and 10 to 130 meters, respectively, with water temperatures below 10°C and salinity ranges greater than 26 psu. In the Hudson-Raritan Estuary juveniles were found most abundantly at temperatures of 2 to 6°C and 12-22°C in the spring and fall respectively (Reid et al., 1999). Atlantic sea herring are primarily pelagic, but may also be found in shallow, nearshore areas. Larvae are exclusively pelagic.

As Atlantic sea herring is predominately a pelagic species occurring in higher salinities than typically found within the Flushing Bay, direct and indirect impacts to this species within the project area are not anticipated. Juveniles and adults would also likely not prefer the shallow waters within the proposed project area and if found in the vicinity of the proposed project area would be able to find comparable habitat in the vicinity and avoid short-term construction impacts.

Black Sea Bass

The proposed project area is designated as EFH for juvenile and adult black sea bass (*Centropristus striata*). This species is usually associated with warm temperatures and with structured habitats, such as reefs and shipwrecks, on the continental shelf. During warmer months juveniles are found in estuaries and coastal areas, often near shelter. Adults are found in slightly deeper water than juveniles and summer in coastal areas, usually near structured habitat, from the Middle Atlantic Bight into the Gulf of Maine. The black sea bass moves to warmer waters south of New Jersey in the fall and returns to the north in the spring, when southern water temperatures begin to rise above 7°C (Steimle et al., 1999b). The populations migrate inshore into coastal areas and bays in southern New England and the Middle Atlantic Bight. Both juveniles and adults use structured habitats for shelter such as eelgrass, oyster beds, rocky reefs, exposed stiff clay, shipwrecks, bridge abutments, submerged pipes and culverts, rip-rap barriers and rough bottoms along the sides of navigational channels. Juveniles occur in the high salinity areas of many estuaries along the coast from North Carolina to Cape Cod. Adults are usually found in deeper bays and coastal waters than juveniles. Both juveniles and adults are typically found at temperatures above 6°C and salinities greater than 18 psu. The reported temperature range for black sea bass is 6 – 29°C, but they are rarely encountered below 11°C. The minimum salinity threshold for black sea bass is 7 psu, but they are rarely encountered below 12 psu (Musick and Mercer, 1977). The soft silty, open habitat of Flushing Bay combined with low DO levels would likely cause juveniles and adults to seek out more suitable habitat within the Bay and East River and would be able to avoid construction impacts. Therefore, the proposed project would not have a significant impact to on this species.

Bluefish

The proposed project area is designated as EFH for juvenile and adult bluefish (*Pomatomus saltatrix*). Juvenile and adults are pelagic and are common in estuaries from May through October and April through October respectively. Juveniles are pelagic, using estuaries as nursery areas, and can be found over sand, mud, silt, or clay substrates. Juveniles typically inhabit estuaries from May to October, preferring temperatures between 19-24°C, and salinities between 23-36 psu. Juveniles have been reported to intrude into waters with salinities as low as 3 psu. They depart these habitats in October to migrate south to warmer waters. Juvenile bluefish prey upon crustaceans and polychaetes (Fahay et al., 1999).

Adults are schooling pelagic species, highly migratory, with a seasonal occurrence in New York/New Jersey Harbor from April to October, and they are generally not associated with bottom habitats. Adult bluefish are found in the open ocean, large embayments and estuarine and estuarine systems with salinities of 25 psu or greater. Adults prefer temperatures between 18-22°C, and salinity above 25 psu and will migrate south when water temperatures drop below 14°C. Bluefish normally travel in large schools which may contain up to several thousand individuals. Larger fish initially inhabit deeper water, but move progressively shoreward into shallow areas as the summer progresses. Trawls conducted in 1986 by the DEP indicated that bluefish may inhabit this area if suitable (NEA, 2002b). Additionally a finfish survey conducted by HydroQual on behalf of the DEP in 2001 collected bluefish (NEA, 2002b). Bluefish, however, are predominately pelagic. occurring in higher salinities and lower temperatures than typically found within Flushing Bay; minimal direct and indirect impacts are anticipated to this species within the proposed project area.

Pollock

The proposed project area is designated as EFH for juvenile and adult pollock (*Pollachius virens*). Small juveniles are also known as “harbor pollock”, as these juveniles migrate inshore at about three to four months where they inhabit rocky subtidal and intertidal zones. They undergo a series of inshore-offshore movements linked to temperature until near the end of their second year. At this point the juveniles move offshore, where they remain through their adult stage. Juveniles utilize a wide variety of substrates, including sand, mud, rocky bottom and vegetation. Juveniles are found at temperatures from 0-16°C and prefer salinities around 31.5 psu. Adult pollock have little preference for substrate type. They are found at high salinities, inhabit a wide range of depths and prefer water temperatures from 0-14°C. Adults tend to inhabit deeper waters in the spring and summer than in the winter and they are typically found further offshore than juveniles. Pollock are a schooling species that are found through the water column. Due to the shallow depths and estuarine salinity levels within Flushing Bay, this species would not be expected to utilize the proposed project area and therefore no short-term or long-term impacts to pollock are anticipated.

Red Hake

Flushing Bay is designated as EFH for larvae, juveniles and adult life stages of red hake (*Urophycis chuss*). Red hake typically spawn in the Middle Atlantic Bight between April and

October. This species makes seasonal migrations to follow preferred temperature ranges, inhabiting shallow water in the spring and summer, but move to deep offshore water to over-winter. They are found on soft mud, silt or sand bottoms, but can also be found on rocky bottoms where water temperatures are below 13°C. Larvae are pelagic and tend to be restricted to deeper marine areas over the inner continental shelf (Able and Fahay, 1999). Larvae are typically found in surface waters with temperatures below 19°C, depths less than 200 meters, and salinities greater than 0.5 psu and are most often found throughout the mid-Atlantic Bight from May through December, with peak abundance during June and October (Wilk et al., 1990).

Juveniles are pelagic until they reach approximately 25 mm total length or greater at which time they become demersal seeking shelter along the continental shelf bottom within depressions in the sediment or among live sea scallop beds (Steimle et al., 1999a). Juveniles also may associate with other forms of shelter including debris and artificial reefs (Steimle et al., 1999a). Juveniles are typically found on shell substrates with water temperatures below 16°C, depths of less than 100 meters, and a salinity range of 31 to 33 psu. Juveniles remain associated with sea scallop beds through their first fall and winter (until approximately 90-116 mm in length), and then occupy either estuarine or inshore marine waters over sand or mud substrates, prior to joining adults in the offshore migration during their second winter. Juveniles are sensitive to low DO levels less than 4.2 mg/L and would likely not tolerate the low levels of DO associated with the warmer months of the year within Flushing Bay.

Adult red hake prefer depths of 10-130 meters, temperatures below 12°C and salinity levels of 33 to 34 psu. Adults within the Hudson-Raritan Estuary were observed to have a preference for DO concentrations greater than 6 mg/L. The demersal juveniles and adults require a structural habitat for survival, such as mantles of sea scallops, surf clam shells or man-made debris for shelter. Larval red hake typically feed on copepods and juveniles prey on benthic and pelagic crustaceans such as decapod shrimp, mysids, euphausiids and amphipods (Steimle et al., 1999a). Adults have similar diets to juveniles and also consume pelagic fish and squid.

Generally the average temperatures are warmer and the average salinity is lower within the proposed project area than is preferred by this species. Additionally, the proposed project area is shallow and DO levels during warmer months have been measured below 4 mg/L, a condition that all life stages would likely not tolerate. Therefore utilization of the proposed project area by this species is expected to be minimal. Individuals would be able to avoid construction and seek out nearby habitat within outer Flushing Bay and East River.

Scup

Designated EFH exists within the proposed project area for eggs, larvae, juveniles and adult scup (*Stenotomus chrysops*). Scup move inshore during April and Mary and spend the summer in bays and coastal waters within 10 km of the coast, where they prefer sandy bottoms and structured habitats. All life stages of this species are found in estuaries during the spring and summer. Spawning adults and eggs are typically found in larger bodies of water over sandy or weed-covered bottoms. Spawning occurs between May and August and peaks during June. Eggs and larvae are pelagic and are found in large bodies of waters, such as bays and sounds. Eggs and larvae are observed in area where water temperatures are between 12.8 and 22.8°C. Juveniles are

most commonly observed at depths between 5 and 12 meters, with water temperatures ranging from 9 to 26°C and at DO levels greater than 4.0 mg/L (Steimle et al., 1999c). Juvenile scup, however, may not tolerate the summer DO minima observed in the vicinity of the proposed project area, which was measured at 3.2 and 2.76 mg/L for top and bottom waters respectively during August of 2011. Similar to juveniles, adult scup prefer sandy bottoms and structured habitats, such as artificial reefs, rocky ledges or wrecks. Adults are commonly observed in salinities ranging from 20 to 31 psu with DO values greater than or equal to 4.0 mg/L (Steimle et al., 1999c).

Adults typically use submerged structures for feeding and shelter. As eggs and larvae are pelagic and because the existing DO and salinity conditions within Flushing Bay are near the acceptable thresholds for juvenile and adult scup, the occurrence of this species within the proposed project area is expected to be unlikely. Potential direct and indirect impacts would therefore be minimal with juveniles and adults preferring more suitable habitat conditions in nearby areas.

Summer Flounder

The proposed project area is designated as EFH for larvae, juvenile and adult summer flounder (*Paralichthys dentatus*). In the New York Bight, summer flounder usually occupy inshore regions during the warmer months and move offshore for the winter season. This species prefers habitats over sand, mud and vegetated substrate. Spawning occurs on the continental shelf from September through January, with peaks in October and November. Spawning adults and eggs are, therefore, not expected in the proposed project area. Larvae are most abundant from September to February at approximately 12 to 50 miles from shore at depths of 10 to 76 meters deep with salinity levels between 23–33 psu. Based on the distance from shore and depth preferences, it is unlikely that summer flounder larvae would be present in the proposed project area.

Juveniles are typically found in estuaries, including mud flats where water temperatures are greater than 22°C with salinities of 10 to 30 psu. During the summer months, adult summer flounder migrate from offshore waters to shallow coastal and estuarine environments. Adults often feed in estuaries in the warmer months and are active during daylight hours as they are primarily visual feeders. Summer flounder larvae and juveniles are opportunistic feeders but primarily feed on microcrustaceans and small polychaetes (Packer et al., 1999). Adult prey includes shrimp, mysids, anchovies (*Anchoa* spp.) and Atlantic silversides (*Menidia menidia*).

Summer flounder move offshore during colder months. Adults are typically found at temperatures between 9-26°C and depths up to 25 meters, and have been reported in freshwater tidal portions of mid-Atlantic estuaries. Adult and juvenile summer flounder occur in New York/New Jersey Harbor during warmer months, primarily May through October, in shallow water over sand and mud substrates, and sometimes within submerged aquatic vegetation (SAV) or macroalgae beds or around pilings.

Although this species was not collected in previous aquatic surveys, juvenile and adult summer flounder may be present in the vicinity of the proposed project area during a limited

period in the late spring and summer months. Potential direct and indirect impacts to juvenile and adult summer flounder would include the temporary disruption of bottom habitat and the short-term loss of forage organisms in the immediate vicinity of the project area. However, both juveniles and adults would be able to avoid the short-term construction and find comparable habitat and feeding areas nearby. Subsequent to the completion of the proposed project, the species would be able to return and re-establish in the project site. In addition, it is anticipated that recovery of the benthic community would occur quickly and that the short term loss of foraging habitat would not be a significant long-term impact to EFH. Therefore, the proposed project would not have a significant impact to EFH for this species.

Windowpane Flounder

Flushing Bay is designated EFH for eggs, larvae, juvenile and adult windowpane flounder (*Scopthalmus aquosus*). Windowpane flounder occur at all depths in estuaries of the Mid-Atlantic Bight, including the New York/New Jersey Harbor, with juveniles and adults seasonally most abundant in deeper channels occurring over mud or fine-grained sand (Chang et al., 1999). Eggs and larvae are concentrated in the mid to upper water column, and juveniles and adults prefer bottom habitats of mud or fine-grained sand. Spawning occurs in inner shelf waters beginning in February or March and reaches a peak in May. Eggs and larvae are respectively found in surface and pelagic waters with temperatures below 20°C at depths less than 70 meters. Preferred water temperatures are below 25°C and 26.8°C for juveniles and adults respectively. Spawning adults, eggs, and larvae are often observed from February to December, with a spring-spawning event (peak in May) in the polyhaline portion of estuaries and a fall-spawning event (peak in October) in offshore waters of the continental shelf. Juvenile and adult life stages occur within a wide range of salinities, from 5.5 to 36 psu. Juveniles can be found in waters from 1 to 100 meters in depth and adults in waters 1 to 75 meters deep. Windowpane eggs and larvae are pelagic and therefore direct impacts would be expected to be minimal.

Potential direct and indirect impacts to juvenile and adult windowpane flounder would include the temporary disruption of bottom habitat and the short-term loss of forage organisms in the immediate vicinity of the project area. However, both juveniles and adults would be able to avoid the short-term construction and find comparable habitat and feeding areas nearby in other portions of Flushing Bay or the East River. In addition, it is anticipated that recovery of the benthic community would occur quickly and that the short term loss of foraging habitat would not be a significant long-term impact to EFH. Therefore, the proposed project would not have a significant impact to the EFH for this species.

Winter Flounder

The proposed project area is designated as EFH for eggs, larvae, juveniles and adult winter flounder (*Pseudopleuronectes americanus*). Winter flounder typically occur in estuarine and continental shelf habitats. Winter flounder spawn between February and April in estuaries and bays of the Mid-Atlantic Bight, including New York/New Jersey Harbor, at water temperatures below 15°C, over sand, mud and gravel substrates (< 6 meters deep) (Pereira et al., 1999). Winter flounder eggs are demersal, adhesive, and stick together in clusters. Eggs are found in depths less than five meters deep, with water temperatures below 10°C and salinity

between 10 and 32 psu. Larvae are non-buoyant and have a strong benthic orientation, often resting on the bottom between swimming efforts (Pearcy, 1962). Young-of-the-year (YOY) can be expected to spend their first year in the estuary before moving to deeper water habitats including the inner continental shelf during the fall (Able and Fahay, 2010). Larvae are most abundant in the spring and subsequently as juveniles in the summer and prefer temperatures between 2°C and 15°C within DO levels of 10.0 to 16.1 mg/L. Prey items for larval winter flounder include copepod nauplii, small polychaetes and invertebrate eggs (Pereira et al., 1999). Juvenile winter flounder occur from 1 to 50 meters, at temperatures of 10°C to 25°C and at salinity between 10-33 psu. Adult winter flounder prefer bottom habitats of mud or fine-grained sand, with larvae found in both bottom habitats and in the water column. During summer months, winter flounder adults reside in nearshore coastal waters, with the distance offshore determined by water temperature, i.e., the warmer the water temperature the further offshore adults move. Winter flounder adults are typically found on mud, sand, and gravel substrates, at water temperatures below 25°C, salinity between 15-33 psu, and water depths between 1-100 meters.

Previous finfish surveys conducted within Flushing Bay indicated the presence of both early life stage (larvae) in the early summer (June) and juvenile/adult winter flounder in the late summer/early fall (September). However, an analysis of the habitat suitability within the project area based upon known habitat preferences for winter flounder indicates a sub-optimal or only marginally suitable habitat for all winter flounder life stages (DEP, 2012). DO values within Flushing Bay are only marginally suitable and will be depressed as a result of high sediment oxygen demand (SOD). As a result, it is less likely that spawning winter flounder would use the inner portion of Flushing Bay for spawning. If any spawning does occur in the inner bay, survival of eggs, larvae, and juveniles may be low and contribute little to the overall winter flounder population, especially as average monthly DO values decrease into the spring and early summer as reflected in the most recent five-year historic data set collected by the DEP in Flushing Bay. Moreover, a significant portion of the proposed project area along the western and southern shoreline of the inner bay is within the intertidal zone and would be exposed during low water conditions. This would be detrimental to winter flounder eggs which are adhesive and would not move with the receding tide line and would thus be exposed to desiccation and/or enhanced predation. Similarly, larvae would not be able to migrate into deeper water and would also be exposed to enhanced predation in shallow water.

DEP also prepared and submitted a *Habitat Characterization Study for Winter Flounder and Striped Bass* within Flushing Bay to the NYSDEC in April 2012. This report described the existing habitat conditions for winter flounder and striped bass within and in close proximity to the proposed project area. Based on the existing conditions and the data prepared and submitted in the habitat characterization report (DEP, 2012), the proposed dredging area represents sub-optimal or only marginally suitable habitat for any life stage of winter flounder. This conclusion was supported by the NYSDEC who issued a waiver of the existing winter flounder environmental window within Flushing Bay for the proposed project on May 10, 2012 allowing for year round dredging. The proposed project would result in the removal of degraded sediments and an increase in water depths and is not anticipated to have significant long-term impacts to winter flounder EFH.

Coastal Migratory Pelagic Species

Flushing Bay is within the greater New York/New Jersey Harbor estuary and is considered EFH for several coastal migratory pelagic species including cobia (*Rachycentron canadum*), King mackerel (*Scomberomorus cavella*) and Spanish mackerel (*Scomberomorus maculatus*). Typical EFH for these species include sandy shoals of capes and offshore bars, rocky bottoms and barrier island ocean-side waters from the surf to the shelf break zone. The habitat within the proposed project area is very shallow and experiences low salinity levels; these species would, therefore not be expected to occur within Flushing Bay and no impacts are anticipated.

Shark Species

The proposed project area is also designated as EFH for neonates of the sand tiger shark (*Carcharhinus taurus*), dusky shark (*Carcharhinus obscurus*) and sandbar shark (*Carcharhinus plumbeus*). In addition it is also designated as EFH for adult sandbar sharks. Sand tigers sharks, although commonly found in estuaries are usually found south of the proposed project area from Barnegat Inlet, New Jersey south to Cape Canaveral, Florida. Dusky and sandbar sharks are not commonly found in estuaries and avoid low salinity levels. The shallow (less than seven feet), estuarine habitat within Flushing Bay would not meet the preferred habitat requirements for these species and they would not be expected to occur within the proposed project area. No impacts are anticipated.

4.2 Non-Managed Species Assessment

In addition to the species with EFH designations within the project area, an evaluation of Federally-designated threatened and endangered species (Atlantic and shortnose sturgeon) as well as species of concern (American eel, American shad and river herring) and forage species are also evaluated in this assessment including striped bass, a non EFH-managed species with commercial and recreational importance.

Striped Bass

Striped bass (*Morone saxatilis*) is not an EFH-managed species; however, it is often included in project assessments because of its importance as a commercial and recreational species.

Striped bass are anadromous, spawning in the brackish – freshwater tidal portions of mid-Atlantic estuaries. The Hudson-Raritan Estuary is recognized as an important spawning and nursery habitat for striped bass, contributing up to 10% of the entire western Atlantic coastal stock (McLaren et al., 1981, Waldman et al., 1990). In addition to the Hudson-Raritan Estuary, the Chesapeake Bay and Albemarle-Pamlico Sound estuaries are important spawning grounds for the U.S. East coast stock. Striped bass eggs and pelagic larvae are not present in New York/New Jersey Harbor and Long Island Sound waters. Spawning occurs at or near the surface in fresh or slightly brackish waters at temperatures ranging from 10 to 23°C; peak spawning activity is observed between 15 and 20°C.

Juvenile striped bass are abundant in inter-pier areas, but can also be found in high concentrations in open water (Able and Duffy-Anderson, 2006). Cantelmo and Wahtola (1992) concluded that relatively deep, well-maintained inter-pier zones had significantly greater populations of striped bass than shallow inter-pier areas where silt had accumulated. When other factors control the distribution of striped bass, such as water temperature and salinity, they readily leave the inter-pier habitat for other habitat types. For example, when water temperatures are very low, striped bass concentrate in open water further upstream in the estuary (Waldman, 1992). Optimum environmental conditions for juvenile striped bass are 16-23°C and 10-20 psu (Fay et al., 1983).

Adult striped bass spawn in fresher waters (slightly brackish to freshwater) and therefore Flushing Bay would represent unsuitable habitat for eggs, larvae, YOY and spawning adults. This is consistent with the current striped bass environmental window for Flushing Bay which is focused upon the protection of overwintering striped bass. For juvenile and adult striped bass, DO values will be depressed as a result of high SOD values. Depressed DO values are likely to be limiting during the late winter and into early spring. This is supported by the historic data set collected by the DEP in Flushing Bay. Important winter concentration areas for striped bass juveniles and adults are deeper and salinities ranges are less than the ranges found in Flushing Bay during sampling efforts in January 2012, for inclusion in the Habitat Characterization Study for Winter Flounder and Striped Bass in Flushing Bay (April 2012). A significant limiting condition for overwintering striped bass would be the shallow water depths (generally less than 7 feet at MLLW) within the project area which would not be preferred habitat for juvenile and adult striped bass. The water temperatures measured in January 2012 ranged from 4.0 to 4.8°C, suitable for striped bass during winter; however, this was a warm winter and normal winter water temperatures in the shallow inner bay area near the proposed dredging likely approaches 0 to 1°C which would be lower than the preferred winter range of temperatures. Potential habitat for foraging (benthic forage base) is also unavailable at this time within the project area and in general this area of Flushing Bay lacks available structure preferred by juveniles. Moreover, juvenile and adult striped bass are highly mobile and able to move through these unsuitable areas and select areas outside of Flushing Bay with more preferred habitat conditions. Flushing Bay in the vicinity of the proposed dredging would therefore not represent preferred habitat for juvenile or adult striped bass during the winter and early spring. This conclusion was likewise supported by the NYSDEC who issued a waiver of the striped bass environmental window for the proposed dredging on May 10, 2012 based on the existing data for striped bass.

Atlantic Sturgeon

The New York Bight population of the Atlantic sturgeon (*Acipenser oxyrinchus*); is a distinct population segment (DPS) of this species that has been listed as an endangered species in accordance with the Endangered Species Act (ESA). The species has been in decline due to bycatch, habitat degradation, ship strikes, and locks and dams. NMFS recently completed a review of the conservation status of this species and has proposed re-classification of the New York Bight, Chesapeake Bay, and south Atlantic coastal sub-population to “endangered”, while the Gulf of Maine sub-population would be re-classified as “threatened”. Atlantic sturgeons are anadromous and enter river systems during the spring months to spawn. They migrate up-river during April and May. Adults prefer to spawn in flowing water, over rocky substrates with hard

complex bottoms at depths ranging from 36 to 88 feet. The rocky habitats provide the newly hatched young with cover from predators among the interstitial spacing. Atlantic sturgeon is typically a transient species and would not be expected to occur within Flushing Bay. Individuals that may be found in the East River would likely be making their way from the open ocean waters to the Hudson River for their seasonal spawning migrations. As a result, it is not anticipated that this species would be impacted by the proposed project and no impacts are anticipated.

Shortnose Sturgeon

The shortnose sturgeon (*Acipenser brevirostrum*) is a federally-designated endangered species in accordance with the ESA. The species has been in decline due to the construction of dams and locks, ship strikes, bycatch, pollution, habitat alteration, dredging and commercial exploitation. Shortnose sturgeons are anadromous and enter the rivers during the spring to spawn. The adults prefer to spawn over hard complex bottoms such as gravel or cobbles while the young prefer interstitial spaces as cover from predators. Shortnose sturgeons are generally found from the southern tip of Manhattan north to the Federal dam at Troy. The shortnose sturgeon, like the Atlantic sturgeon, is typically a transient species and would only be found in the East River as it makes it way upriver to freshwater spawning areas and would not be expected to occur within Flushing Bay. As a result, it is not anticipated that this species would be impacted by proposed project.

American Shad

EFH is not designated for American shad (*Alosa sapidissima*); however, resource agencies often request that this species be included in EFH assessments in New York/New Jersey Harbor as a species of special concern. American shad is a highly migratory fish that spends most of its life in the Atlantic Ocean, ranging along the coast from the St. Lawrence River in Canada to the St. Johns River in Florida (Waldman, 2006). It is often cited as a classic example of an anadromous fish with adults of the species migrating into natal coastal rivers and tributaries to spawn in the spring (Everly & Boreman, 1999).

In the Hudson River Estuary, spawning typically occurs between dusk and midnight in tidal freshwater areas at water temperatures between 12° and 21°C (Waldman, 2006). Spawning can occur over a variety of bottom substrates including sand, silt, mud, gravel and boulders (ASMFC, 2006). Eggs are demersal and non-adhesive. Both feeding and yolk-sac larvae are planktonic and are passively transported to lower reaches of the estuary where they remain as juveniles until the late fall or early winter before migrating to the sea (Everly & Boreman, 1999).

River Herring: Alewife & Blueback Herring

EFH is not designated for river herring; however, resource agencies likewise often request that this species be included in EFH assessments in New York/New Jersey Harbor as a species of special concern. Termed collectively by fishermen as “river herring” because of the difficulty in distinguishing them, alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) spend most of the year in coastal Atlantic waters before migrating into nearshore

rivers and tributaries to spawn in the spring. In general, blueback herring have a more southern distribution than alewife (Mullen et al., 1986).

Alewife usually enter the Hudson-Raritan Estuary first, between late-February and mid-May, preferring to spawn in freshwater tributaries in relatively shallow water with a slow current (Everly & Boreman, 1999). Blueback herring usually spawn about a month later and in different habitat, preferring deep freshwater tributaries with swift currents over hard gravel or sand substrates (Everly & Boreman, 1999). The eggs of both species are pelagic and adhesive. Alewife larvae and juveniles remain in their freshwater nurseries until June (bluebacks follow about one month later) before moving downstream into the lower estuary and out into the ocean (Everly & Boreman, 1999). Juvenile blueback herring are largely planktivorous, feeding on copepods, chironomids and cladocerans while the juvenile alewife diet is primarily composed of amphipods and chironomids (Waldman, 2006).

American Eel

American eels (*Anguilla rostrata*) have a complex life history. Beginning as eggs hatching in the Sargasso Sea, the larvae drift with the Gulf Stream, eventually reaching freshwater streams and estuarine habitats, distributed from Greenland to South America (USFWS, 2011). The eels mature and remain in these bodies of water until they make their way back to the Sargasso Sea to spawn. The American eel has been extirpated from portions of its historical freshwater habitat due to the loss of habitat and migration corridors over the last century as a result of dam construction and other mechanisms. Local population declines have also been attributed to mortality in hydropower plant turbines, degradation of current habitat and overharvest (USFWS, 2011). A review of the American eel for inclusion under the ESA was considered in 2007; found that protection of the American eel was not warranted. However, in 2010 an additional petition was received and a more extensive review of the species is currently being undertaken (USFWS, 2011).

American eel have been found within Flushing Bay during previous sampling undertaken by HydroQual, Inc on behalf of the DEP in 2001 (NEA, 2002b). Individuals that may be found within the proposed project area would be able to seek our similar habitat in other portions of the Bay or in other areas along the East River during the construction. Following completion of the proposed project, American eels would be able to return to the proposed project area.

Forage Species

A number of seasonally abundant forage fish may potentially occur within Flushing Bay. These may include Atlantic menhaden (*Brevoortia tyrannus),* Atlantic silverside (*Menidia menidia*), Atlantic tomcod (*Microgadus tomcod*) and bay anchovy (*Anchoa mitchelli*). Previous studies have identified the presence of anchovy spp., Atlantic menhaden and Atlantic tomcod (NEA, 2002b) within Flushing Bay.

The bay anchovy is a schooling species that feeds on zooplankton. It is one of the most abundant species in Atlantic coast estuaries and is an important prey resource for larger, predatory fishes. Distribution of bay anchovy ranges widely from temperate to subtropical waters

along the Atlantic and Gulf coasts between Maine and Mexico. Adults are abundant in a variety of coastal habitats, including include near-shore waters off sandy beaches, submerged aquatic vegetation (SAV) beds, and shallow to deep offshore waters (Morton, 1989). Bay anchovies are pelagic, and commonly found in depths ranging from 3 - 120 feet. Bay anchovy are tolerant of a wide range of salinity and temperature. In the spring, individuals that have wintered in the deep channels of lower estuarine and contiguous coastal ocean areas move toward shore or upstream into shoal areas within the estuary. Spawning occurs at water temperatures between 9 and 31°C and salinities greater than 9 psu (Dovel, 1971).

The Atlantic silverside is a small schooling fish that frequents tidal marshes, seagrass bed and shallow shore areas. They superficially resemble anchovies, but are distinguished from them by their very small mouth. Silversides occur in dense schools and represent an important prey resource for larger predatory fishes. The Atlantic silverside is the most abundant silverside in mid-Atlantic estuaries, including New York/New Jersey Harbor. The geographic range of the Atlantic silverside is from Nova Scotia to central Florida, including all coastal waters and tributaries. They remain in estuaries areas or the coastal surf zone throughout most of the year (Conover and Murawski, 1982). Habitat preferences include sand and gravel substrates, salt marshes and eelgrass beds. Atlantic silversides tolerate a wide range of temperature and salinity conditions, but are most commonly encountered from 7 to 31°C and 4 to 36 psu. During winter months, silversides migrate out of estuaries and occupy deeper coastal waters (Conover and Ross, 1982). Atlantic silversides spawn at temperatures between 9 and 12°C in the intertidal zone during daytime high tides. Eggs are deposited in the intertidal zone 1.5 to 1.8 meters above the mean low water mark on stems or roots of *Spartina alterniflora* or on mats of detritus (Conover and Kynard, 1984). Atlantic silversides are omnivores, feeding opportunistically on a variety of available organisms. Food may include amphipods, copepods, cladocerans, fish eggs, mysid shrimp, young squid, molluskan larvae, annelid worms, and insects (Spraker and Austin, 1997).

The Atlantic tomcod is a small codfish, known primarily from north Atlantic inshore waters. The Hudson River stock of Atlantic tomcod is the southernmost spawning population along the Atlantic Coast. Atlantic tomcod spawn in brackish to tidal freshwater portions of estuaries. Northern populations of Atlantic tomcod may migrate into coastal waters during winter however the Hudson River stock is reported to overwinter in the lower Estuary (LMS, 1975). Atlantic tomcod spawn close to shore in association with emergent vegetation in tidal marshes or under mats of floating debris (Howe, 1971). Eggs are demersal, and are found in masses in seaweed, stones or other substrate (Collette and Klein-MacPhee, 2002). Adult tomcod are able to tolerate a wide range of salinities (0 – 31 psu) and temperatures (-1 to 25°C) (Collette and Klein-MacPhee, 2002). Tomcod larvae cannot withstand salinity greater than 20 psu.

The Atlantic menhaden, locally referred to as “bunker” is a seasonally abundant herring, occurring in large schools in coastal bays and estuaries. Atlantic menhaden migrate seasonally along the Atlantic coast from Maine to central Florida, moving north through the mid-Atlantic Bight during spring and south during fall to over winter in waters south of Cape Hatteras (Able and Fahay, 1998). Atlantic menhaden spawn in continental shelf waters along the U.S. Atlantic coast, although some spawning activity is reported to occur in the lower reaches of estuaries and coastal bays (Dovel, 1971). Larval migration into estuaries occurs during October – June and

large schools of juvenile menhaden use estuaries as nurseries during the summer before migrating offshore in the fall. The temperature range for adult Atlantic menhaden in the Mid Atlantic region is 0 to 25°C. Most spawning activity takes place between 15 and 18°C. Atlantic menhaden tolerate a broad salinity range (<1 to 36 psu) (Ahrenholz et al., 1989).

Individuals and schools of forage species will be able to avoid temporary construction impacts from the proposed project and find suitable habitat in nearby areas of the Bay and East River. Following construction activities, they would be able to return to the proposed project area. Minimal direct and indirect impacts to these species are therefore anticipated.

5.0 ASSESSMENT SUMMARY

Of the 17 species for which EFH has been designated within the project area, eight species (Atlantic butterfish, black sea bass, bluefish, red hake, scup, summer flounder, winter flounder, and windowpane flounder) have the potential to occur at least seasonally in the inner Flushing Bay area while the remaining species would not be expected to occur or would be much less abundant based on their life history requirements. These species include king mackerel, Spanish mackerel, cobia, sand tiger shark, dusky shark and sandbar shark which typically occur in much deeper, coastal waters and are highly migratory. Potential project impacts for these EFH species are therefore anticipated to be negligible.

Federally-designated threatened and endangered species (Atlantic and shortnose sturgeon) as well as species of concern (American shad and river herring) and forage species were also evaluated in this assessment, but impacts to these species were similarly determined to be negligible based on life history requirements and the unlikely expectation for them to occur within the project area. Juvenile and adult striped bass have the potential to occur in Flushing Bay, but a significant limiting condition would be the shallow water depths within the immediate project area and the lack of available structure preferred by juvenile striped bass. Moreover, juvenile and adult striped bass are highly mobile and able to move into more suitable areas with more preferred habitat conditions. This conclusion was supported by NYSDEC who determined that a temporary waiver to the seasonal work restriction for striped bass was warranted.

The proposed project is part of the larger Flushing Bay Waterbody/Watershed Plan that is designed to achieve overall improvements to surface water quality (i.e., upgrades to the existing wastewater treatment infrastructure and sewer modifications to reduce CSO). The proposed dredging project includes improvements to adjacent wetland areas and the dredging work will use best management practices in order to minimize potential impacts on the marine environment, as a result the primary short-term impacts will be limited to the removal of benthic sediments and temporary increases in suspended sediment loadings from the dredging. The use of a hydraulic dredge and/or clamshell dredge with an environmental (sealed) bucket, controlled hoist speeds, silt curtains, and control of any fallback during materials transfer and/or the controlled release of decant water will minimize any short-term impacts on the fish community. Specific standards for dredging will be contained in the general and project-specific conditions anticipated as part of the state and federal permits for the proposed action. A net long-term benefit to the fish community is anticipated due to improved water quality, improved water circulation, deeper waters and a greater volume of available open-water habitat.

Direct Impacts

Potential short-term direct impacts in the project area would be limited primarily to demersal (i.e., bottom-oriented) species and life stages with the possibility of occurring within the project area. Pelagic species, such Atlantic butterfish and bluefish, that might occur in the project area would experience a temporary short-term disturbance to a small portion of habitat and respond by avoidance of the active work area. Pelagic larval and egg life stages with limited mobility would be carried through the active project area by tides and currents, resulting in limited exposure to in-water construction-related disturbance.

Winter flounder eggs and larvae may occur within the inner Flushing Bay. However, an assessment of overall habitat suitability (DEP, 2012) determined that the immediate project area represents only marginally suitable habitat for winter flounder eggs and larvae as a significant portion of the project area, especially along the western and southern shoreline of the inner bay, is within the intertidal zone and is exposed during low water conditions. This would be detrimental to winter flounder eggs which are adhesive and would not move with the receding tide line and would thus be exposed to desiccation and/or enhanced predation. Similarly, larvae would not be able to migrate into deeper water and would also be exposed to enhanced predation in the excessively shallow water areas.

It is anticipated that most of the direct impacts to EFH would be associated with short-term effects. These short-term effects would result in the exclusion of the fish species from the project areas due to increased turbidity, water disturbance, noise, vibrations and changes in water depth. Small turbidity increases might occur in the surrounding waters which in turn may have direct impacts to some EFH species that are sensitive to water quality fluctuations or rely on sight feeding (i.e., winter flounder, bluefish). However, turbidity in Flushing Bay is naturally highly variable, depending on freshwater inflow, tidal re-suspension, storms, and other factors. Potential increases in suspended solids and turbidity would be minimized by using approved equipment and techniques for sediment dredging (e.g., sealed-bucket dredge, controlled hoist speeds).

Indirect Impacts

The primary indirect impact to EFH species occurring in the project area is the effect of the in-water construction on benthic communities. Many of the listed finfish are demersal or benthic feeders, and may experience a reduction in feeding efficiency for some period of time during and immediately following in-water construction.

Dredging will increase turbidity within the project area. Typically, however, elevated turbidity is limited in duration to the time of actual dredging and impacts on benthic fauna are generally confined to the immediate vicinity of dredging operations (Stern and Stickle, 1978). Elevated levels of suspended silt and clay reduces available planktonic food resources. Excess silt will suffocate some benthic organisms in the surrounding area. Filter feeders will have difficulty locating and capturing food due to an increase in suspended non-edible particulates.

Recovery times vary from several months to several years. In most cases, "recovery" is defined as a return of the benthic assemblage to baseline, or pre-dredging, conditions of abundance, biomass, and community composition. In some cases, opportunistic taxa achieve densities many times higher than that reported prior to dredging. The current benthic community is dominated by species that are indicative of environmental stresses; these organisms (i.e., *Streblospio benedicti*) reproduce quickly and are expected to recolonize the project site within six months to a year (Wilber & Clarke, 2007). Following the recolonization of the benthic community, finfish that may utilize the area are expected to follow. If the dredged area is not impacted by continued dredging, unusually high sedimentation rates, or some other disturbance, natural succession should occur, restoring the original benthic community within one to five years (Newell et al., 1998).

Cumulative Impacts

Relative to direct project impacts and indirect impacts, cumulative impacts on EFH-managed fishery species and their forage base may include:

- *Time crowded perturbations* – repeated occurrence of one type of impact in the same area;
- *Space crowded perturbations* – a concentration of a number of different impacts in the same area;
- *Synergisms* – occurrence of more than one impact whose combined impact is greater than the sum of the individual parts;
- *Indirect impacts* – those caused by, produced after, or away from the initial perturbation;
- *Nibbling* – a combination of all the above taking place slowly and incrementally.

As Flushing Bay is densely urban and industrialized, the potential for a variety of ongoing and future activities to cumulatively affect EFH-managed species does exist. The potential waterfront re-development and improvements at the World's Fair Marina represents an example of activity which could potentially contribute to a cumulative impact on finfish habitat resources in Flushing Bay. However, the affected area associated with the dredging project is small relative to the total EFH that exists throughout the New York Harbor estuary for any of the EFH-managed and non-managed species. Moreover, the areas to be dredged are very shallow intertidal habitat that does not currently serve as important or unique fish habitat. The sediments and benthic habitat have been highly impacted by CSO discharges and other sources of pollution. Cumulative impacts related to the alteration of habitats within and adjacent to the in-water construction areas, in concert with impacts stemming from any potential waterfront re-development activities are therefore expected to be minimal.

6.0 CONCLUSIONS

As part of the CSO Consent Order, the DEP is required to conduct dredging to remove CSO-impacted mounds of sediment that contribute to nuisance odors and aesthetic impacts within Flushing Bay. As a result of the existing water quality conditions and/or the physical characteristics within Flushing Bay at the proposed project area, many of the species of concern

identified in Table 4-1 would not be expected to occur in high densities. In addition, the developed and modified shoreline adjacent to the proposed project area is a further limiting factor for some of the EFH species because of a lack of basic habitat needs. Given the existing degraded water quality and sediment conditions, the proposed project area does not present optimal habitat characteristics for many EFH species.

Due to the existing habitat conditions within the proposed project area, the short-term duration and localized nature of the dredging project, adverse impacts to the aquatic resources in the project area would be considered minor and insignificant. Following construction activities, the aquatic community temporarily displaced or removed would be able to return and re-establish within the proposed project area. The proposed project would remove existing CSO sediments that are contributing to shallow water depths and degraded sediments, which negatively impact EFH.

Based upon the information provided within this EFH assessment, it is therefore concluded that the proposed project would not result in significant impacts to designated EFH species. Potential impacts would be associated with a temporary increase in turbidity in the water column and a temporary loss of bottom habitat and benthic forage species caused by the dredging activities. The physical habitat after completion of the dredging activities is anticipated to improve. It is anticipated that recovery of the benthic community would occur quickly and that the short term loss of the benthic community would not be a significant long-term impact to EFH.

7.0 BIBLIOGRAPHY

Able, K.W. and J.T. Duffy-Anderson. 2006. Impacts of piers on juvenile fishes in the lower Hudson River. pp. 428-440 in: J.S. Levinton and J.R. Waldman, (Eds.) *The Hudson River Estuary*. Cambridge University Press, New York.

Able, K.W. and M.P. Fahay. 2010. Ecology of Estuarine Fishes: Temperate Waters of the Western North Atlantic. Johns Hopkins University Press. 584p.

Able, K.W. and F.P. Fahay. 1998. *The First Year in the Life of Estuarine Fishes in the Middle Atlantic Bight.* Rutgers University Press, New Brunswick, NJ.

Ahrenholz, D.W, J.F. Guthrie, and C.W. Krouse.1989. Results of abundance surveys of juvenile Atlantic and Gulf menhaden *Brevoortia tyrannus* and *B. patronus*. NOAA Technical Memorandum NMFS No. 84.

Atlantic States Marine Fisheries Commission (ASMFC). 2006. American Shad: Life History & Habitat Needs. http://www.asmfc.org.

Cantelmo, F.R. and C.H. Wahtola, Jr. 1992. Aquatic habitat impacts of pile-supported and other structures in the lower Hudson River. pp. 59-75. In W. Wise, D.J. Suszkowski, and J.R. Waldman (eds.). Proceedings: Conference on the impacts of New York Harbor development on aquatic resources. Hudson River Foundation, New York, NY.

Chang, S., Berrien, P.L., Johnson, D.L., Morse, W.W. 1999. Essential fish habitat source document: Windowpane, *Scophthalmus aquosus*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 137; 32 p.

Collette, B.B. and G. Klein-MacPhee, Eds. 2002. *Bigelow and Schroeder's Fishes of the Gulf of Maine, 3rd Ed.* Smithsonian Institution Press, Washington, D.C.

Conover, D. and S.A. Murawski. 1982. Offshore winter migration of the Atlantic silverside, *Menidia menidia*. *Fishery Bulletin* 80:145-150.

Conover, D.L., and M.R. Ross. 1982. Patterns in seasonal abundance, growth and biomass of the Atlantic silverside, *Menidia menidia*, in a New England estuary. *Estuaries* 5:275-286.

Conover, D. and B. E. Kynard. 1984. Field and laboratory observations of spawning periodicity and behavior of a northern population of the Atlantic silverside, *Menidia menidia* (Pisces: Atherinidae). Environmental Biology of Fishes 11:161-171.

Cross, J.N., Zetlin, C.A., Berrien, P.L., Johnson, D.L., McBride, C. 1999. Essential fish habitat source document: Butterfish, *Peprilus triacanthus*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 145; 42 p.

Dovel, W.L. 1971. Fish eggs and larvae of the upper Chesapeake Bay. University of Maryland Natural Resources Institute Contribution No. 460, Special Science Report No. 4.

Everly, A.W. and J. Boreman, 1999. Habitat Use and Requirements of Important Fish Species Inhabiting the Hudson River Estuary: Availability of Information. NOAA Technical Memorandum NMFS-NE-121.

Fahay, M.P., Berrien, P.L., Johnson, D.L., Morse, W.W. 1999. Essential Fish Habitat Source Document: Bluefish, *Pomatomus saltatrix*, Life History and Habitat Characteristics. NOAA Tech Memo NMFS NE 144; 68 p.

Fay, C.W., R.J. Neves, and G. B. Pardue. 1983. Striped Bass – Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Mid-Atlantic). USFWS Publication FWS/OBS-82/11.8.

Holzmacher, McLendon, and Murrell (H2M), 1984. Flushing Bay and Creek Odor Abatement Feasibility Study. Prepared for New York City Department of Environmental Protection.

Lawler, Matusky, and Skelly Engineers. 1975. 1974 Hudson River aquatic ecology studies: Bowline Point and Lovett generating stations. Prepared for Orange and Rockland Utilities, Inc.

McLaren, J.B., J.C. Cooper, T.B. Hoff and V. Lander 1981. Movements of Hudson River striped bass. *Transactions of the American Fisheries Society* 110:158-167.

Morton, T. 1989. Bay anchovy - Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic). U.S. Fish and Wildlife Service Biological Report No. 82(11.97).

Mullen, D.M., C.W. Fay and J.R. Moring. 1986. Alewife/Blueback Herring – Species Profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic).U.S. Fish and Wildlife Service Biological Report 82(11.56).

National Oceanic & Atmospheric Administration (NOAA). Guide to Essential Fish Habitat Description. National Marine Fisheries Service. Office of Habitat Conservation. Habitat Protection Division. Northeast Regional Office. 25 July 2011 < http://www.nero.noaa.gov/ hcd/list.htm>.

New York City Department of Environmental Protection (DEP), 2011a. New York Harbor Water Quality Survey Data. Stations E15 and FB1.

New York City Department of Environmental Protection (DEP). 2011b. Prepared by HydroQual Inc. City-Wide Long Term CSO Control Planning Project: Flushing Bay Waterbody/ Watershed Facility Planning Report.

New York City Department of Environmental Protection (DEP), 2012. Prepared by AECOM/HydroQual, a Joint Venture. Citywide Dredging Engineering Design Contract Services: Habitat Characterization Study for Winter Flounder and Striped Bass, Flushing Bay. April 2012.

New York City Department of Environmental Protection (DEP). 2012b. Intertidal and Subtidal Benthos Sampling Report. Prepared by AECOM/HydroQual Joint Venture. December 2012.

Northern Ecological Associates, Inc. (NEA). 2002a. Final Benthic Report: Flushing Bay and Creek Ecological Restoration Project. Prepared for the U.S. Army Corps of Engineers. March 2002.

Northern Ecological Associates, Inc. (NEA). 2002b. Final Finfish Report: Flushing Bay and Creek Ecological Restoration Project. Prepared for the U.S. Army Corps of Engineers. March 2002.

Packer, D.B., Griesbach, S.J., Berrien, P.L., Zetlin, C.A., Johnson, D.L., Morse, W.W. 1999. Essential fish habitat source document: Summer flounder, *Paralichthys dentatus*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 151; 88 p.

Pearcy, W.G. 1962. Ecology of an estuarine population of Winter flounder, *Pseudopleuronectes americanus* (Walbaum). II Distribution and dynamics of larvae. *Bulletin of the Bingham Oceanographic Collection, Yale University* 18:16-37.

Pereira, J.J., R. Goldberg, J.J. Ziskowski, P.L. Berrien, W.W. Morse and D.L. Johnson. 1999. Winter Flounder, *Pseudopleuronectes americanus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-138.

Reid, R.N., Cargnelli, L.M., Griesbach, S.J., Packer, D.B., Johnson, D.L., Zetlin, C.A., Morse, W.W., Berrien, P.L. 1999. Essential fish habitat source document: Atlantic herring, *Clupea harengus*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 126; 48 p.

Steimle, F.W., Morse, W.W., Berrien, P.L., Johnson, D.L. 1999a. Essential fish habitat source document: Red Hake, *Urophycis chuss*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 133; 34 p.

Steimle, F.W., Zetlin, C.A., Berrien, P.L., Chang, S. 1999b. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 143; 42 p.

Steimle, F.W., Zetlin, C.A., Berrien, P.L., Johnson, D.L., Chang, S. 1999c. Essential fish habitat source document: Scup, *Stenotomus chrysops*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 149; 39 p.

Studholme, A.L., Packer, D.B., Berrien, P.L., Johnson, D.L., Zetlin, C.A., Morse, W.W. 1999. Essential fish habitat source document: Atlantic Mackerel, *Scomber scombrus*, life history and habitat characteristics. NOAA Tech Memo NMFS NE 141; 35 p.

URS. 1986. Preliminary Engineering Report: Dredging of Flushing Bay and Creek for Odor Abatement.

United States Army Corps of Engineers (USACE). 1996. Ecosystem Restoration Project Reconnaissance Study. Prepared for Flushing Bay and Creek. April 1996.

United States Fish and Wildlife Service (USFWS). 2011. The American Eel. http://www.fws.gov/northeast/newsroom/eels.html

Waldman, J.R., 2006. The Diadromous Fish Fauna of the Hudson River: Life Histories, Conservation Concerns & Research Avenues. pp. 171-188 in: J.S. Levinton and J.R. Waldman, (Eds.) The Hudson River Estuary. Cambridge University Press, New York.

Waldman, J.R. 1992. Determining the habitat value of piers and platforms: an empirical approach. pp. 207-221 In W. Wise, D.J. Suszkowski, and J.R. Waldman (Eds.). Proceedings: Conference on the impacts of New York Harbor development on aquatic resources. Hudson River Foundation, New York, NY.

Waldman, J.R., D.J. Dunning, Q.E. Ross, and M.T. Mattson. 1990. Range dynamics of Hudson River striped bass along the Atlantic coast. *Transactions of the American Fisheries Society* 119:910-919.

Weiss, H.M. 1995. Marine animals of southern New England and New York: Identification keys to common nearshore and shallow water macrofauna. State Geological and Natural History Survey of Connecticut. Department of Environmental Protection Maps and Publications Office. Hartford, CT.

Wilber, D.A. & D.G. Clarke. 2007. Defining and assessing benthic recovery following dredging and dredged material disposal**.** Presented at Western Dredging Association WODCON XVIII Convention, Lake Buena Vista, Florida.

Wilk, S.J., W.W. Morse, and L.L. Stehlik. 1990. Annual cycles of gonad-somatic indices as indicators of spawning activity for selected species of finfish collected from the New York Bight. *Fishery Bulletin* 88:775-786.