Gowanus Canal CSO Facilities

Final Environmental Impact Statement

CEQR No. 17DEP040K

Prepared by New York City Department of Environmental Protection

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Gowanus Canal Combined Sewer Overflow (CSO) Facilities
FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

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The FEIS is available on the website of the New York City Department of Environmental Protection: http://www.nyc.gov/html/dep/html/environmental_reviews/index.shtml

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List of Acronyms

ACM	asbestos-containing material
BFE	base flood elevation
BOA	Brownfield Opportunity Area
BTU	British Thermal Unit
CAA	Clean Air Act
CAF	Coastal Assessment Form
CAMP	Community Air Monitoring Program
CEQR	New York City Environmental Quality Review
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CHASP	Construction Health and Safety Plan
CO	carbon monoxide
CP	construction phase (CP-1, CP-2, and CP-3)
CPC	New York City Planning Commission
CPP	Construction Protection Plan
CSO	combined sewer overflow
CWA	Clean Water Act
DCP	New York City Department of City Planning
DDC	New York City Department of Design and Construction
DEIS	Draft Environmental Impact Statement
DEP	New York City Department of Environmental Protection
DO	dissolved oxygen
DOC	New York City Department of Correction
DOB	New York City Department of Buildings
DSNY	New York City Department of Sanitation
EAS	Environmental Assessment Statement
EFH	Essential Fish Habitat
ESD	Empire State Development
FAR	floor area ratio
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GCC	Gowanus Canal Conservancy
GHG	greenhouse gas
GI	Green Infrastructure
H_2S	hydrogen sulfide

HGL	hydraulic grade line
HLSS	High Level Storm Sewers
IBZ	Industrial Business Zone
IMD	New York City Interim Multiple Dwelling
KW	kilowatt
LBP	lead-based paint
LPC	New York City Landmarks Preservation Commission
LTCP	Long Term Control Plan
MDL	New York City Multiple Dwelling Law
MG	million gallons
mgd	million gallons per day
MGP	manufactured gas plant
MHHW	mean higher high water
MHW	mean high water
MLLW	meant lower low water
NAAQS	National Ambient Air Quality Standards
NAPL	Non-Aqueous Phase Liquid
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPCC	New York City Panel on Climate Change
NPL	National Priorities List
NWI	National Wetland Inventory
NYC Parks	New York City Department of Parks and Recreation
NYCDOT	New York City Department of Transportation
NYCEDC	New York City Economic Development Corporation
NYCHA	New York City Housing Authority
NYCRR	New York City Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDEC ROD	New York State Department of Environmental Conservation Record of Decision
NYSDOS	New York State Department of State
NYSHPA	New York State Historic Preservation Act
OH	Owls Head
OPRHP	New York State Department of Parks, Recreation, and Historic Preservation
PAH	polycyclic aromatic hydrocarbon
PCM	Post Construction Compliance Monitoring program
PDI	Pre-Design Investigation
PDS	Pre-Demolition Survey
PLACES	New York City's Planning for Livability, Affordability, Community, Economic Opportunity and Sustainability program
PM	particulate matter

PPV	peak particle velocity
PRG	Preliminary Remediation Goals
RAP	Remedial Action Plan
RD Order	Remedial Design Order
RH	Red Hook
ROWB	right-of-way bioswale
ROD	Record of Decision
SEQRA	New York State Environmental Quality Review Act
sf	square foot
SGS	stormwater greenstreet
SHPO	New York State Historic Preservation Office
S/NR	State and National Register (-eligible)
SO_2	sulfur dioxide
SO_x	sulfur oxides
SOE	support of excavation (construction)
SLR	sea level rise
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elmination System
SVOC	semi-volatile organic compound
SWPPP	stormwater pollution prevention plan
TPPN	*Technical Policy and Procedure Notice*
TSS	total suspended solids
ULURP	Uniform Land Use Review Procedure
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USEPA ROD	U.S. Environmental Protection Agency Record of Decision
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WPAA	waterfront public access area
WQS	water quality standards
WRP	New York City Waterfront Revitalization Program
WWTP	Wastewater Treatment Plant
WWFP	Watershed Facility Plan

Foreword[1]

This document is the Final Environmental Impact Statement (FEIS) for the Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project. The New York City Department of Environmental Protection (DEP) issued a Notice of Completion for the Draft Environmental Impact Statement (DEIS) on September 14, 2017. A duly noticed public hearing on the DEIS was held on January 17, 2018, in Spector Hall at 22 Reade Street in Manhattan. Public comments were accepted at that hearing and throughout the comment period, which remained open until January 29, 2018.

This FEIS addresses all substantive comments made on the DEIS since its publication, during the public hearing and subsequent comment period. Those comments are summarized and responded to in Chapter 27, "Response to Comments on the DEIS." Written comments on the DEIS are included as a new Appendix 27-1. Changes to the text and graphics from the DEIS were made in this FEIS, as necessary, in response to these comments.

In addition to Chapter 27 and Appendix 27-1, the principal changes between the DEIS and the FEIS include the following:

- Additional consultation with the New York State Historic Preservation Office (SHPO) and the New York City Landmarks Preservation Commission (LPC) with respect to building preservation at the Head End Site is continuing to be undertaken. Additional information has been added to Chapter 7, "Historic and Cultural Resources," and Chapter 23, "Mitigation."
- Chapter 10, "Hazardous Materials," has been updated with additional information on existing conditions based on additional pre-design investigations completed at the Head End Site and the Owls Head Site.
- The analyses of operational air quality (Chapter 15, "Air Quality") and greenhouse gas emissions (Chapter 16, "Greenhouse Gas Emissions") have been updated to reflect changes to the planned heating, ventilation, and air condition (HVAC) systems for the Head End and Owls Head Facilities. In particular, following publication of the DEIS, the design of the CSO Facilities was refined and now includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. Based on this modification, the design no longer includes emergency generators. In addition, the number of boiler units in each facility has been reduced. Where relevant, description of HVAC system elements has been revised throughout the FEIS to reflect these changes.
- Chapter 20, "Construction," has been updated with additional analysis of construction-related noise during the CP-1 (site preparation, utility relocation, and demolition) and CP-3 (above-grade structures, conveyances, and outfalls construction) construction phases.

[1] This Foreword is new to the FEIS.

Substantive text changes or additions to the FEIS are indicated by double-underlining. Substantive text that has been removed for the FEIS has been identified by ~~strikethrough~~. However, neither underlining nor strikethroughs are used for chapters presented for the first time in this FEIS, such as this Foreword and Chapter 27, “Response to Comments on the DEIS.”

Executive Summary

A. INTRODUCTION

The New York City (City) Department of Environmental Protection (DEP) is issuing this ~~Draft~~ Final Environmental Impact Statement (~~D~~FEIS) pursuant to the New York State Environmental Quality Review Act (SEQRA), City Environmental Quality Review (CEQR), and the Uniform Land Use Review Procedure (ULURP). In accordance with SEQRA and CEQR, DEP is examining the potential for significant adverse environmental impacts that could occur as a result of the Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project. The Project is mandated by the United States Environmental Protection Agency (USEPA) to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, or Superfund).

The Canal is an approximately 1.8-mile-long, manmade waterway located in Brooklyn, Kings County, New York (see **Figure S-1**). In the early 19th century, the site where the Canal is now located was occupied by Gowanus Creek, local tributaries, and lowland marshes. In 1848, the State of New York authorized construction of the Canal in order to open the area to barge traffic, increase circulation and flushing, receive stormwater, and fill the adjacent lowlands for development. Construction of the Canal began in the 1860s by bulkheading and dredging the creek.

Following its construction, the Canal quickly became one of the nation's busiest industrial waterways, serving heavy industries in the area that included coal yards, cement manufacturing, tanneries, paint and ink factories, machine shops, chemical plants, oil refineries, and three manufactured gas plants (MGPs).

In 1911, the City began operating the Gowanus Canal Flushing Tunnel—a pumping system and mile-long tunnel—with the goal of improving the Canal's overall water quality. The Flushing Tunnel improved circulation and flushed stagnant water from the Canal by pumping from the head of Gowanus Canal to Buttermilk Channel, a small tidal strait that separates Governors Island from Brooklyn (see **Figure S-1**). The Flushing Tunnel operated until the mid-1960s and was rehabilitated and reactivated in 1999. At this time, the direction of flow was reversed to bring more highly oxygenated water from Buttermilk Channel to the head of the Canal.

On March 2, 2010, the Canal was designated a federal Superfund site under CERCLA and placed on the National Priorities List (NPL). The main goal of the CERCLA process is to remediate constituents of concern (certain hazardous substances) in the Canal sediments that were deposited over the Canal's long industrial history. On September 27, 2013, the USEPA issued a Record of Decision (USEPA ROD) identifying actions to be undertaken by various parties to remediate contamination in the Canal. As part of the USEPA ROD, USEPA mandated the design and construction of two CSO facilities.

B. PROJECT OVERVIEW

The first of the two CSO facilities, the "Head End Facility," would include an 8-million-gallon (MG) underground tank that would increase CSO capture for overflows that would otherwise be discharged from CSO outfall RH-034 at the "head end," or northernmost portion of the Canal (see **Figure S-2**). Construction of the Head End Facility would require the lease or acquisition of three privately owned

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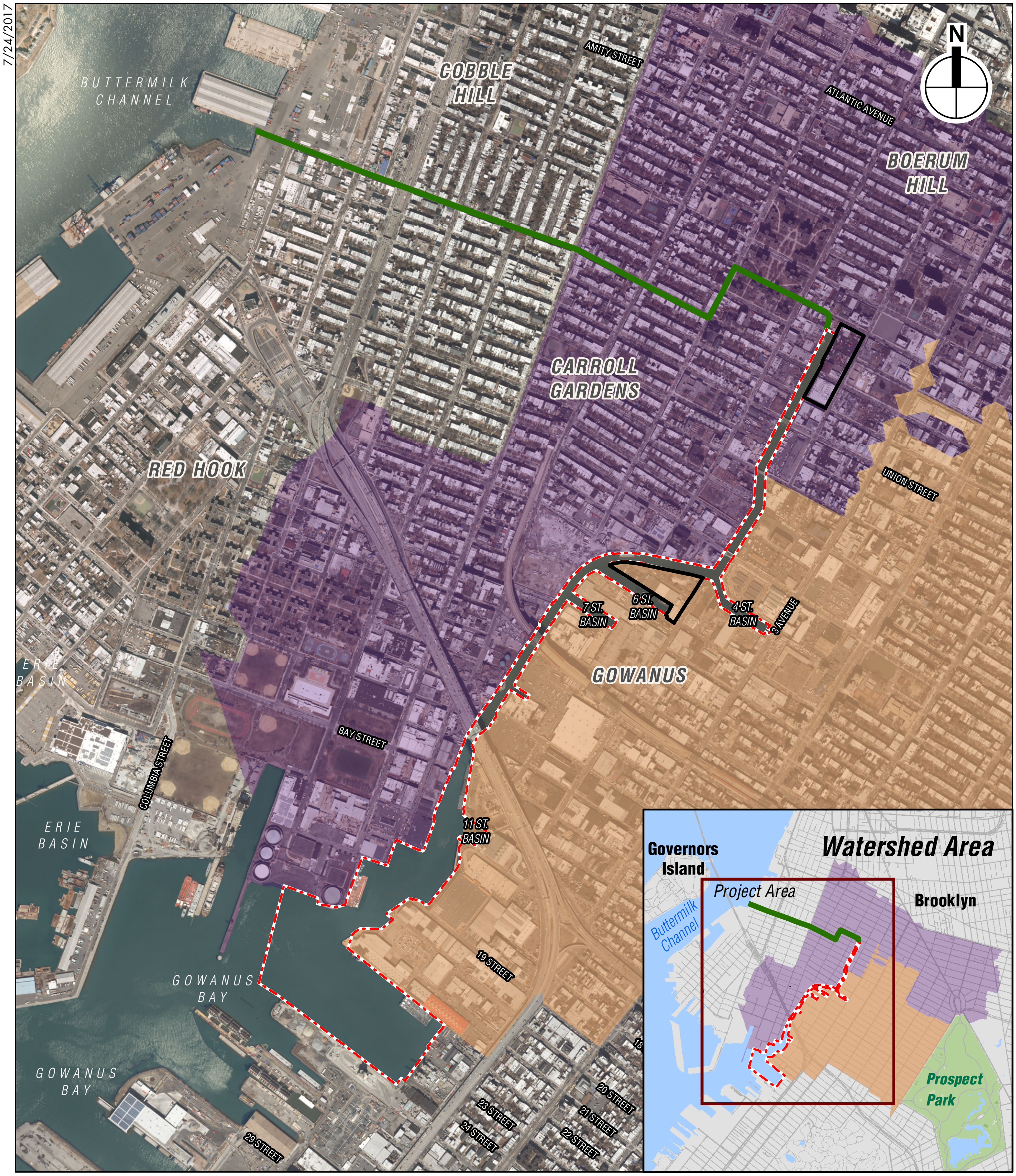

Project Sites
Gowanus Canal
Gowanus Canal Flushing Tunnel
Red Hook Sewershed*
Owls Head Sewershed*

0 1,000 FEET

* Sewershed areas indicate the portions of the Gowanus Canal Watershed served by each WWTP

Gowanus Canal CSO Facilities

Project Area:
Gowanus Canal
Figure S-1

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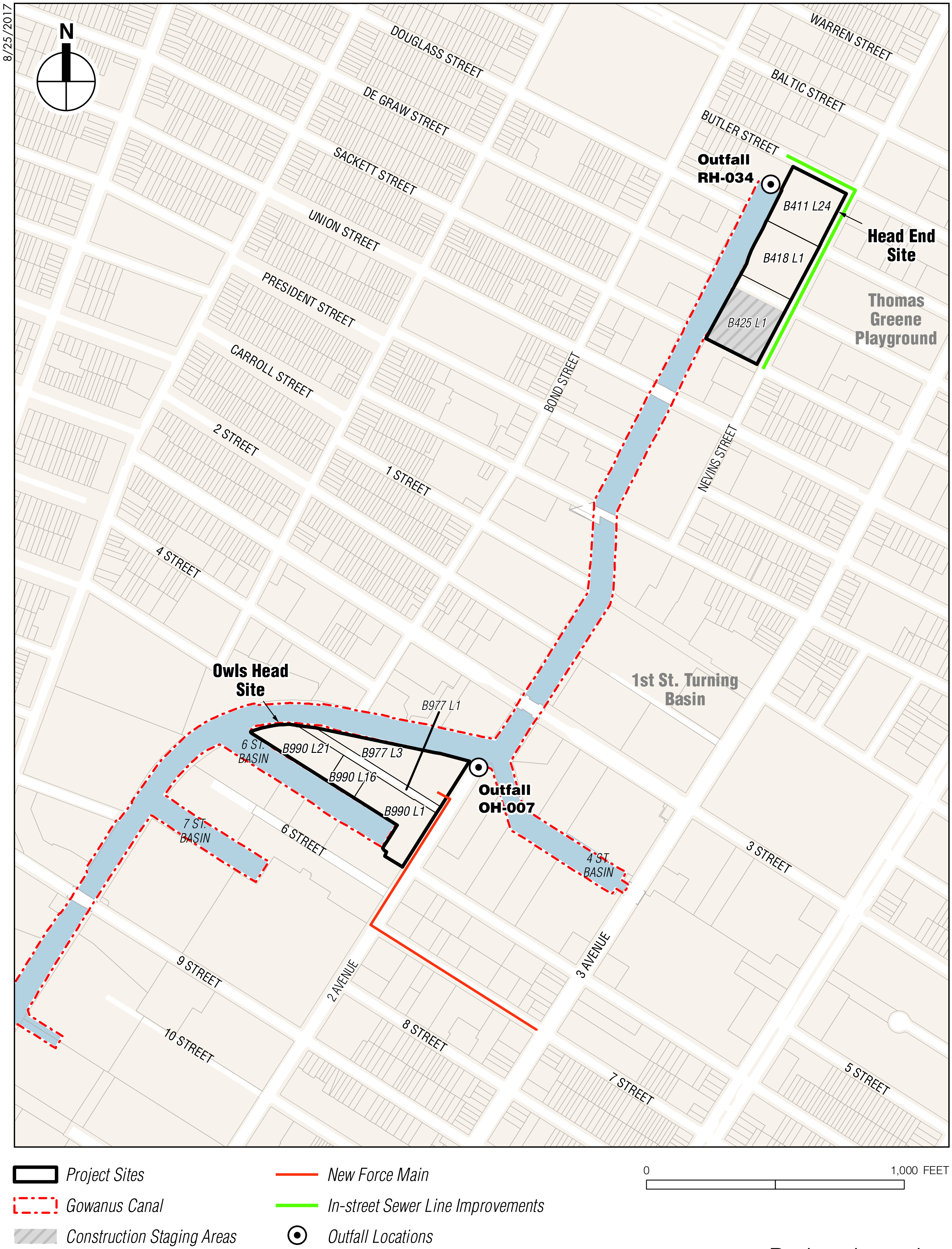

Gowanus Canal CSO Facilities

Project Location
Figure S-2

parcels adjacent to the Canal[1] and is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1).

The second facility, the "Owls Head Facility," would include a 4-MG tank that would increase capture for overflows that would otherwise be discharged from CSO outfall OH-007. The Owls Head Facility would be located at the middle of the Canal (approximately 0.5 miles south of the northernmost portion of the Canal) near the northern terminus of 2nd Avenue near the 4th Street turning basin (see **Figure S-2**).[2] Construction of the Owls Head Facility would require the use of one City-owned parcel (Block 977, Lot 3) and the lease or acquisition of up to four privately owned parcels adjacent to the Canal.[3] The Owls Head Facility is proposed to be located at 2 2nd Avenue (Block 977, Lot 3), 110 5th Street (Block 990, Lot 21), 122 5th Street (Block 990, Lot 16), 22 2nd Avenue (Block 990, Lot 1), and 5th Street (Block 977, Lot 1), with portions of this area used for construction staging.

Collectively, the Project includes the lease or acquisition of up to seven properties to support the facilities and construction staging areas.

C. RECENT INVESTIGATIONS AND ACTIONS CONCERNING THE CANAL

Currently, the Canal is surrounded by a mix of residential, commercial, and industrial uses. The residential areas surrounding the Canal include the neighborhoods of Gowanus, Park Slope, Cobble Hill, Carroll Gardens, and Red Hook, with an increasing residential presence located near and along the waterway. Properties along the waterfront have historically been primarily commercial and industrial; in recent years, new residential developments have been constructed.

In October of 2016, the Department of City Planning (DCP), along with other city agencies launched the Gowanus PLACES Neighborhood Planning Study, which seeks to foster and create a thriving, working, and more resilient neighborhood by reinforcing and encouraging a strong local economy anchored by a mix of uses and businesses, while creating opportunities for new housing with affordable housing in appropriate locations. In early 2017, as part of undertaking the Study, DCP began a robust community outreach process to gather feedback on a variety of topics before developing and sharing a draft planning and land use framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study areas being rezoned to allow for residential use, among other uses and goals of the study, which is not presently permitted by the existing zoning in the area. However, the planning study is currently in its preliminary stages and its outcome and where new residential uses could be permitted is not known at this

[1] DEP will also be pursuing the demapping of the mapped portion of Douglass Street to correct the title and record for this portion of the Head End Facility—this portion of Douglass Street is mapped but unbuilt on portions of Block 418, Lot 1 and Block 411, Lot 24, located in the area to be developed with the Head End Facility. The demapping action is not necessary for the construction of the Head End Facility and will follow on a different schedule from the site selection and acquisition ULURP.

[2] The Canal has four short turning basins that branch to the east of the main channel at 4th Street, 6th Street, 7th Street, and 11th Street; a fifth turning basin located at 1st Street, has been filled in and would be independent of this Project as part of the mandated Superfund remediation of the Canal. Turning basins allow vessels in the Canal to turn and/or reverse direction.

[3] Construction of the Owls Head Facility would also require a site selection pursuant to the City of New York Charter. As described above, the site selection and acquisition actions and the demapping action will undergo separate review under ULURP. As described above and in more detail below, the demapping action is not necessary to facilitate the construction of the Owls Head Facility.

time. Therefore, for the purposes of this EIS and relevant analysis chapters, the existing zoning regulations and associated current patterns and trends applicable to the Head End Site, the Owls Head Site, and the study areas are assumed to remain in place in the 2028 analysis year.

Recent improvements in water quality in the Canal have been spurred by the area’s general shift away from industrial activity to residential and commercial uses, as well as the investments made in compliance with the Clean Water Act, which imposed standards on discharges to the waters of the State. The City undertook a series of improvement projects around the Canal. Studies and actions related to the Canal and the regulatory background of the Project are described below.

RECENT DEP UPGRADES IN GOWANUS CANAL WATERSHED

As a result of the Gowanus Waterbody/Watershed Facility Plan (WWFP) discussed below, the City has upgraded the Gowanus Wastewater Pumping Station, which pumps wastewater to the Red Hook Wastewater Treatment Plant (WWTP), and has constructed a new mile-long force main from the pumping station to the Columbia Street/Red Hook Interceptor Sewer. In addition, the City designed and completed additional improvements to the Flushing Tunnel in 2014, including the installation of new pumps that deliver an average flow of 215 million gallons per day (MGD) and new screens, and improvements to the hydraulic grade line that result in more continuous pumping of oxygenated water to the Canal during low tide.

More recently, DEP has commenced construction and installation of High Level Storm Sewers (HLSS) in the Gowanus watershed area, which are generally located between Carroll Street and State Street near the northern end of the Canal, extending to 4th Avenue to the east (see **Figure S-3**). Once completed, this HLSS project will create a separate stormwater discharge to the Canal through a stormwater outfall at Carroll Street and would reduce stormwater flows to the combined sewer system, which would reduce the frequency and volume of CSO into the Canal. The HLSS is a form of partial separation that separates stormwater from streets or other public rights-of-way from combined sewers. This separation of sewers would help reduce the amount of CSO that is discharged to the Canal, and would reduce street flooding. The first phase of the project (currently underway, with completion expected by the spring of 2018) includes improvements to the area south of Douglass Street; the second phase of construction (expected to begin in 2018 and completed in 2020) includes improvements to the area north of Douglass Street. As part of the project, 87 new catch basins will be installed to allow stormwater to drain from the streets into 14,000 linear feet of new high-level storm sewers. In addition, all existing catch basin drainage connections will be switched from the existing combined sewer to the new high-level storm sewers.

DEP has also invested in Green Infrastructure (GI) that has been constructed, is in construction, or is planned in the Gowanus watershed area, including bioswales in the right-of-way (ROWB) and stormwater greenstreets (SGSs) in the area north and east of the Canal (see **Figure S-4**). GI uses vegetation, soils, and other elements and practices to capture, absorb, and filter stormwater. GI would also reduce the amount of CSO that may reach the Canal.

GOWANUS CANAL WATERBODY/WATERSHED FACILITY PLAN AND LONG TERM CONTROL PLAN

In 2008, DEP prepared the WWFP to document baseline conditions and identify early action items for CSO abatement in advance of the development of a Long Term Control Plan (LTCP) to control CSOs being discharged into the waterbody. The WWFP assessed compliance with existing water quality standards, and evaluated alternatives for meeting those standards. As a result of the WWFP, DEP committed to over $250 million of capital upgrades: as noted above, improvements included upgrading the Gowanus Wastewater Pumping Station and modernizing the Flushing Tunnel. Concurrently with

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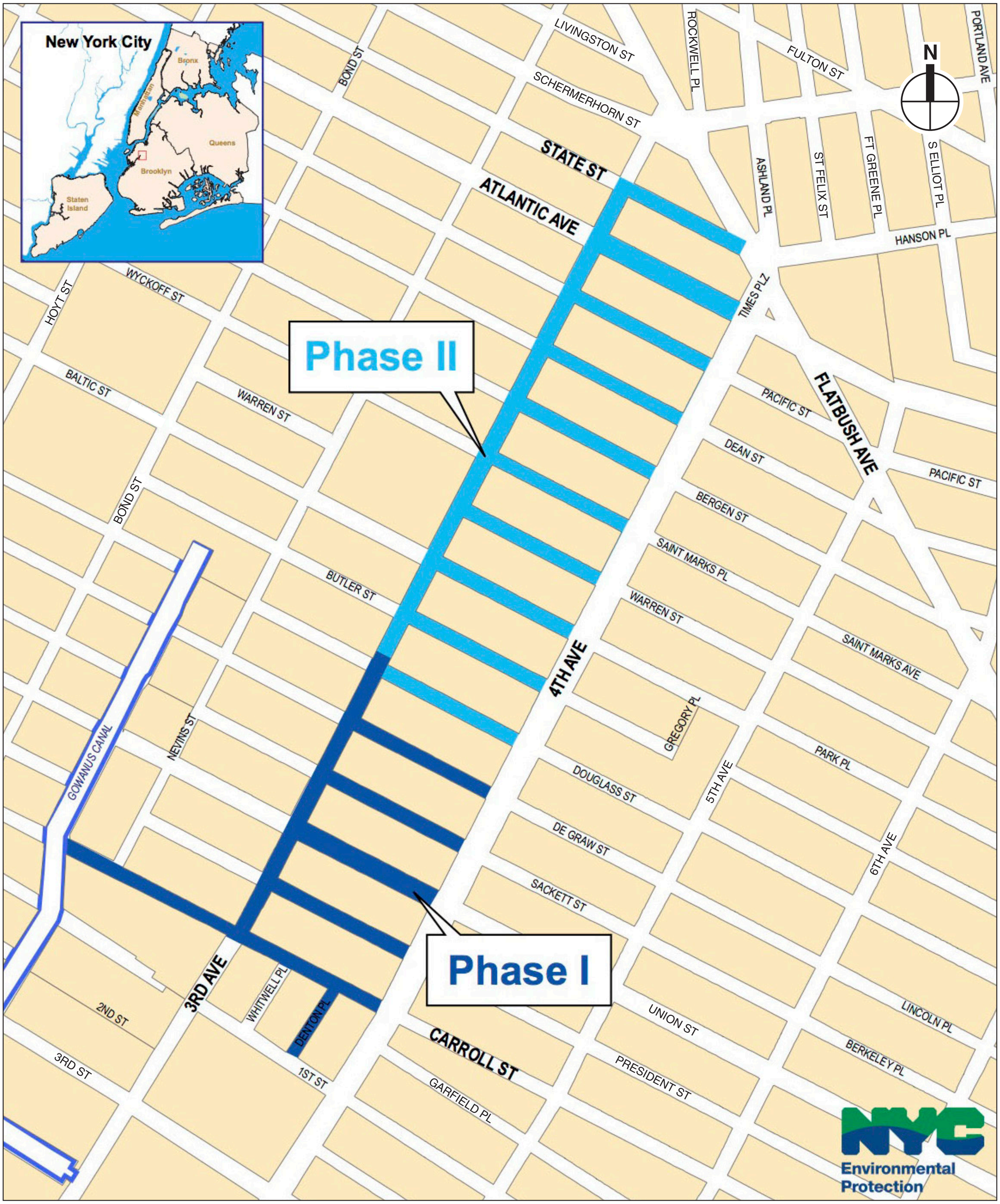
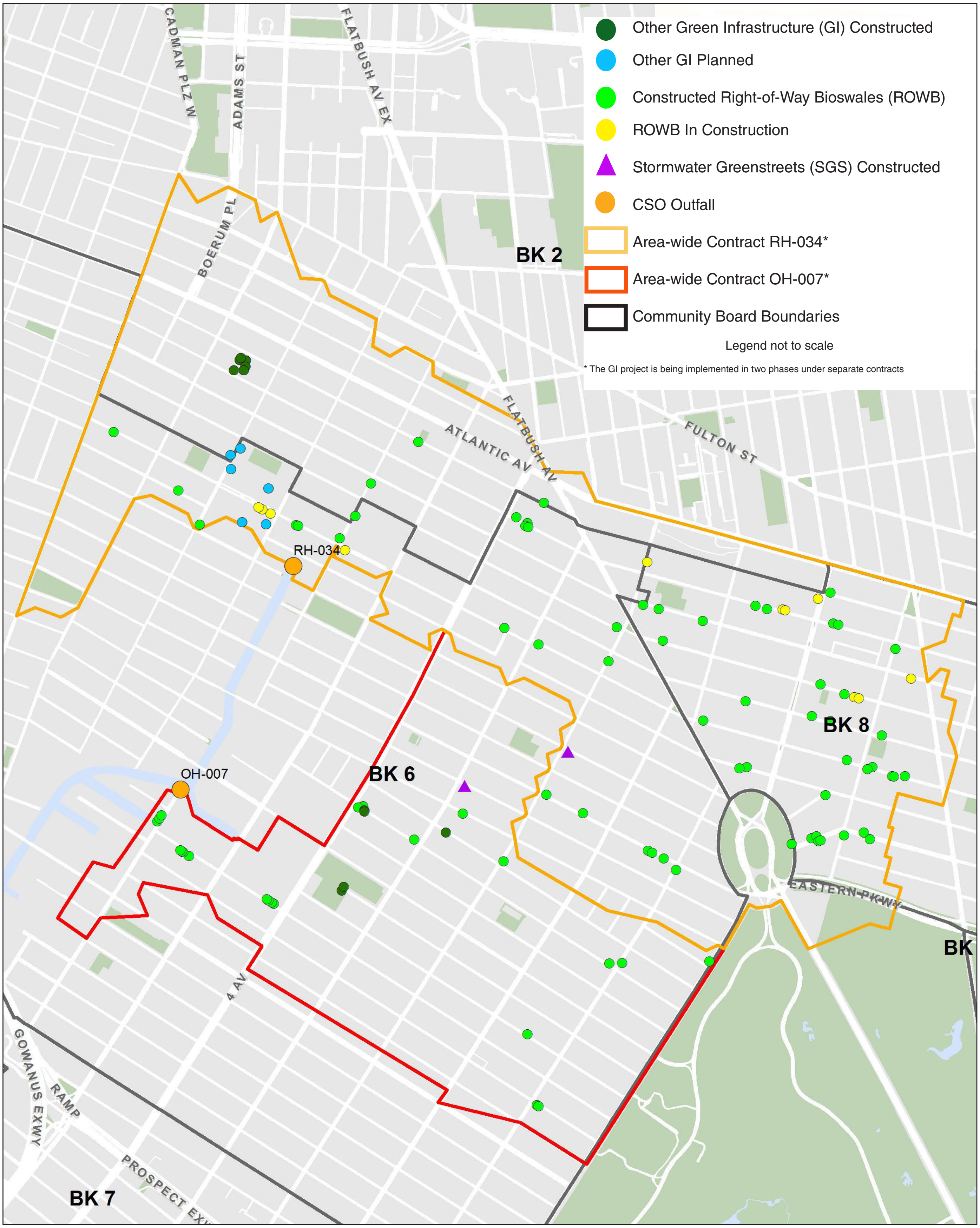


Source: *Gowanus Canal LTCP*

Gowanus Canal High Level
Storm Sewers (HLSS)

Figure S-3



Source: DEP Office of Green Infrastructure

Green Infrastructure (GI) Projects in Gowanus Canal Watershed

Figure S-4

these upgrades, a Post Construction Compliance Monitoring (PCM) program was implemented to regularly collect samples from monitoring stations along the Canal and measure water quality. The PCM measures several markers of water quality, including levels of fecal coliform and enterococci (indicators of human waste and pathogenic bacteria), dissolved oxygen (DO; the oxygen in a waterbody available for aquatic life forms) and secchi disk transparency (the measure of clarity of surface waters, which affects the nutrient cycle by allowing in sunlight). For the period following the reactivation of the Flushing Tunnel (July 2014 to February 2015), the PCM data shows that these investments have resulted in substantial improvements to water quality in the Canal, with a reduction of fecal coliform and enterococci levels and improved DO concentrations.

In 2015, DEP prepared the LTCP for the Canal to identify the need for additional controls to achieve waterbody-specific water quality standards (WQS), consistent with Federal CSO policy[4] and the water quality goals of the Clean Water Act. The LTCP includes alternatives that consider a wide range of reductions in CSO—up to 100 percent CSO control—including investments that would be made by DEP through green and grey infrastructure. Intermediate levels of CSO volume control—approximately 50 percent and 75 percent—were also evaluated.

The LTCP determined that the existing WQS are being met as a result of the significant improvements achieved by the WWFP recommended plan (i.e., operation of the reactivated Flushing Tunnel and upgraded Gowanus Wastewater Pumping Station). In particular, the LTCP determined that water quality in the Canal met the standards for its New York State Department of Environmental Conservation (NYSDEC) classification[5] and that fecal bacteria levels in the Canal also met the WQS for primary recreational contact (recreational activities where the human body may come in direct contact with water, e.g., swimming or diving). In addition, the LTCP concluded that with the build-out of planned GI and HLSS in the area, water quality would further be improved.

Although existing water quality standards are being met, the USEPA ROD for the Gowanus Canal Superfund site directs the City to construct CSO controls that would serve to further improve water quality by reducing CSOs from being discharged to the Canal.

USEPA ROD AND CSO FACILITY SITING PROJECT

As noted above, the Canal was designated a federal Superfund site under CERCLA and placed on the National Priorities List in March, 2010. On September 27, 2013, the USEPA issued a ROD identifying actions to be undertaken by various parties to remediate contamination in the Canal. Unlike the Clean Water Act regulation of CSOs, which focuses on bacteria contamination and DO, CERCLA focuses on contamination caused by industrial pollutants. Accordingly, the USEPA ROD focuses on hazardous substances located in and beneath the Canal, primarily Non-Aqueous Phase Liquid (NAPL) and associated polycyclic aromatic hydrocarbons (PAHs), which were primarily discharged to the Canal from the three former MGPs that operated for over a century along the bank of or near the Canal. As part of the USEPA ROD, USEPA also mandated the construction of the Gowanus Canal CSO Facilities.

[4] The 1994 USEPA CSO Control Policy provides guidance to permittees and permitting authorities on the development and implementation of a LTCP in accordance with the provisions of the federal Clean Water Act (CWA). The CSO policy was first established in 1994 and codified as part of the CWA in 2000.

[5] NYSDEC has designated the Gowanus Canal Class SD above Hamilton Avenue, and Class I below Hamilton Avenue. The best usage of Class SD waters is fishing; the best usage of Class I waters is secondary contact recreation (recreational activities where contact with the water is minimal and where ingestion of the water is not probable, e.g., boating) and fishing.

In February 2014, DEP released a siting and planning study for the two CSO facilities. This effort included: (1) identification and evaluation of CSO facility components and development of facility footprints to be used in the identification of viable sites on which to locate the facilities, including the CSO tanks, conveyance, and associated infrastructure; and (2) identification of potential sites suitable for locating the CSO facilities, development and evaluation of a shortlist of potential sites, and preparation of conceptual designs associated with those sites.

In May 2014, USEPA issued a unilateral Administrative Order for Remedial Design (RD Order) which established milestones for the City to design the two CSO facilities. DEP evaluated a range of tank sizes and alternatives and assessed their performance against the USEPA ROD goal of 58 to 74 percent solids load reduction. DEP submitted Site Recommendation Reports for the Head End and Owls Head Facilities to USEPA in June 2015, which evaluated potential sites for the two CSO facilities.

A focused site screening effort was conducted to identify potential sites for locating the facilities, based on three critical criteria: size of available property; hydraulic analyses and effective capture of CSO; and current or planned land use in the area. The Site Recommendation Report for the Head End Facility evaluated two potential "shortlisted" sites for the Head End Facility—the Head End Canal-side Property, comprised of two privately owned parcels located at 242 Nevins Street and 234 Butler Street and the Park Property, comprised of the City-owned Thomas Greene Playground property—and recommended the Head End Canal-side Property as the location for the Facility. This recommendation also included use of the privately owned parcel at 270 Nevins Street for construction staging, referred to as the RH-034 Staging Area Property. The Site Recommendation Report for the Owls Head Facility recommended the use of a City-owned parcel of land located at 5th Street and 2nd Avenue, together with adjoining privately owned parcels along 5th Street, collectively referred to as the Owls Head Site.

On June 9, 2016, USEPA issued a memorandum to file that states that the size of the two storage tanks should be 8-MG at RH-034 and 4-MG at OH-007. Also on June 9, 2016, USEPA issued an Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery (Settlement Agreement) directing DEP to construct the Head End Facility at the recommended location and requiring that DEP issue a DEIS for the Head End Facility by October 1, 2017. However, under the Settlement Agreement, under certain specified circumstances, USEPA retains the discretion to direct the City to construct the Head End Facility at an alternate site—the City-owned Thomas Greene Playground property, referred to as the Park Property (see **Figure S-5**). In the Settlement Agreement, USEPA also agreed with DEP's recommended site for the Owls Head Facility.

INVESTIGATION AND REMEDIATION OF UPLAND SOURCES OF CONTAMINATION

According to the USEPA ROD, contaminants from upland sources along the Canal—including the Fulton Municipal Works MGP site, Carroll Gardens/Public Place (formerly known as the Citizens Gas Works MGP site), and the Metropolitan MGP site (see **Figure S-6**)—have travelled to the Canal primarily by the migration of NAPL through subsurface soils and groundwater discharge of dissolved-phase contaminants. Although the MGP sites discontinued operations several decades ago, these contaminants continue to migrate into and impact the Canal. The investigation and remediation of these upland sources of contamination, including properties within National Grid's Remedial Investigation Parcel Boundaries, are to be addressed pursuant to administrative orders under the jurisdiction of NYSDEC in coordination with the remediation required under CERCLA. NYSDEC has issued an ROD (NYSDEC ROD) that selected near- and long-term actions intended to prevent the migration of contamination from the former Fulton MGP site into the Canal, protect human health and the environment, and comply with New York State standards, criteria, and guidance.

8/9/2017

Gowanus Canal

Head End Facility Alternative Site

Park Property Alternative

Outfall Locations

In-street Sewer Line Improvements

RH-034 Construction Staging Area*

*NOTE: RH-034 Construction Staging Area Property would be used for both the Project and the Park Property Alternative

0 500 FEET

Gowanus Canal CSO Facilities

Head End Facility Alternative Site

Figure S-5

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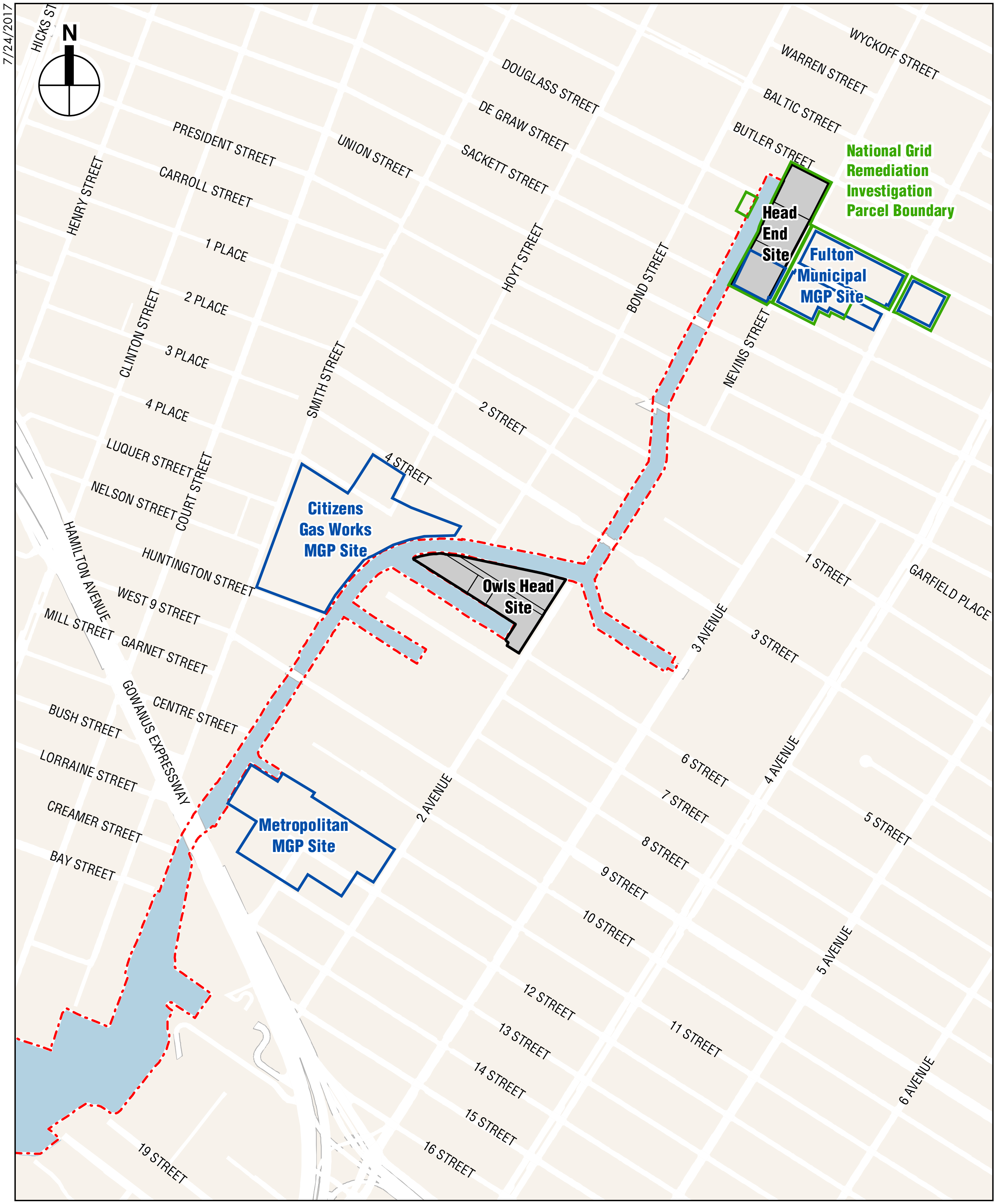


Project Sites

Gowanus Canal

Former MGP Sites (Approximate)

National Grid Remediation Investigation Parcel Boundary

0 1,000 FEET

Gowanus Canal CSO Facilities

Upland Sources of Contamination

Figure S-6

The properties where the Head End Facility would be sited are located within National Grid's NYSDEC-directed Remedial Investigation study area and National Grid is responsible for the remediation of NAPL and other CERCLA hazardous substances at the Head End Facility properties. National Grid's remediation is outside the scope of this Project, and at this time, there is not sufficient information available concerning National Grid's investigations and remediation to enable them to be considered in this environmental review.

D. RED HOOK AND OWLS HEAD SEWERSHEDS AND WWTP SERVICE AREAS

DEP operates 14 WWTPs that receive wastewater flows from large geographic areas within the City; these areas, which typically include multiple neighborhoods, are referred to as WWTP service areas. The smaller geographic region within a WWTP service area in which all wastewater flows are conveyed to a single point, or outlet, before ultimately being conveyed to a WWTP is typically referred to as a sewershed. The Gowanus Canal sewershed encompasses approximately 1,760 acres, of which approximately 1,600 acres are served by combined sewers that convey a combination of stormwater and sanitary sewage (combined sewer flow) to two WWTPs: the Red Hook (RH) and Owls Head (OH) WWTPs (see **Figure S-1**).

In periods of dry weather, the dry weather flow conveyed by the combined sewer system consists of sanitary sewage. During and immediately after certain wet weather events, combined sewers can experience a much larger flow due to stormwater runoff collection. To control flooding at the WWTPs, as well as to protect drainage areas and private property, and reduce the frequency of street flooding, structures known as regulators are built into the combined sewer system to serve as relief points. Regulators prevent excess flow from entering the interceptors, which are larger sewers that convey wastewater to the WWTPs, during wet weather events. The regulators allow two times the amount of a WWTP's design dry weather flow into the interceptors. However, when flow exceeds two times the design dry weather flow, it is diverted by the regulator and runs by gravity through an outfall, known as a CSO. There are 12 combined sewer system outfalls that discharge to the Canal (see **Figure S-7**); these outfalls have permits from NYSDEC. The two largest CSO outfalls (by volume) are RH-034 and OH-007 in the RH and OH service areas, respectively.

As noted above, the Canal's sewershed is partially within the RH WWTP's service area and partially within the OH WWTP's service area. The existing combined sewer system infrastructure in the RH and OH service areas is described below.

RED HOOK WWTP SERVICE AREA

The RH WWTP's service area is located in the northwest section of Brooklyn. As shown on **Figure S-1**, the portion of the Canal's sewershed within the RH WWTP's service area is generally located to the north and west of the Canal; the service area also extends on the east side of the Canal down to Carroll Street. Flow from this area is directed to the RH WWTP for treatment.

During certain wet weather events, combined flow from up to seven CSO outfalls is discharged to the Canal from the RH service area (see **Figure S-7**). Outfall RH-034 discharges the greatest amount of CSO, as measured by activation frequency and overflow volume. RH-034 is located adjacent to the Gowanus Wastewater Pumping Station at the head of the Canal.

Wastewater flows are served by two pumping stations in the area: the Gowanus Wastewater Pumping Station and the Nevins Street Pumping Station (located on Nevins Street near the intersection of Degraw Street) (see **Figure S-8**).

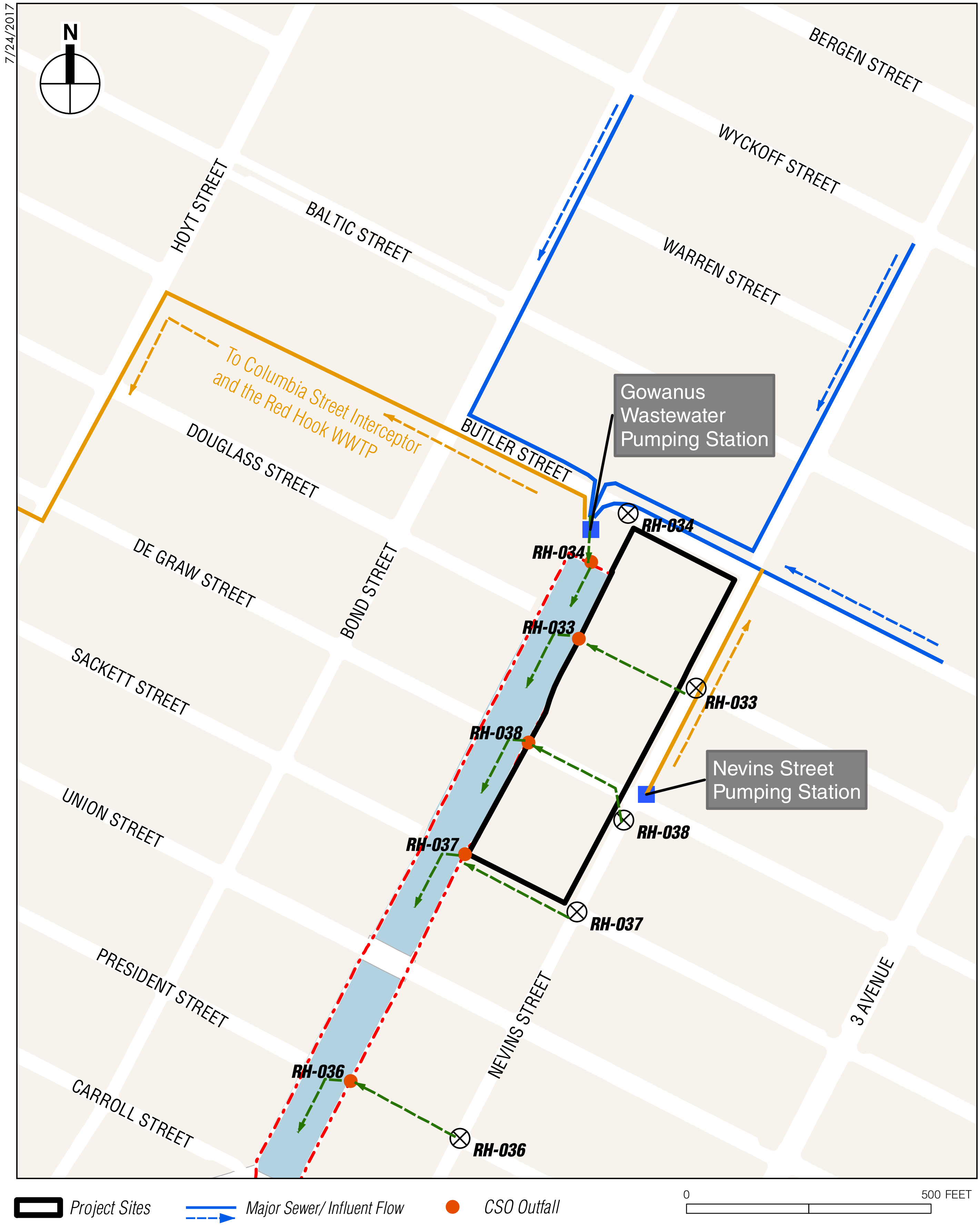
Project Sites
Gowanus Canal
CSO Outfall
Storm Outfall
Pumping Station
Red Hook Sewershed*
Owls Head Sewershed*

* Sewershed areas indicate the portions of the Gowanus Canal Watershed served by each WWTP

0 1,000 FEET

CSO and Stormwater Outfall Locations Along the Gowanus Canal

Figure S-7



Project Sites
Gowanus Canal
Regulator
Major Sewer/ Influent Flow
Force Main/Effluent Flow
Excess Flow
CSO Outfall
Pumping Station

Gowanus Canal CSO Facilities

Red Hook WWTP Service Area
Existing Sewer Flows
Figure S-8

The Gowanus Wastewater Pumping Station and outfall RH-034 primarily receive flows from three major sewers serving neighborhoods north of the Canal. The capacity of the pumping station is 30 MGD. All dry weather and wet weather flow up to 30 MGD is discharged from the pumping station directly to the Columbia Street interceptor sewer via an existing force main. Peak wet weather flows that exceed the capacity of the pumping station are screened and discharged over a weir, which is a structure that regulates flow, to the Canal through outfall RH-034. Tide gates on the RH-034 outfall prevent water in the Canal from backing up into the sewer system.

Four neighboring outfalls (RH-033, RH-036, RH-037, and RH-038) are located near RH-034 along the northeast bank of the Canal. These outfalls receive flows from a separate portion of the combined sewer system that is served by the Nevins Street Pumping Station. Local sewers connect to a sewer located along Nevins Street, which directs flows to the Nevins Street Pumping Station. The Nevins Street Pumping Station sends the collected flow to the interceptor upstream of the RH-034 regulator that leads to the Gowanus Pumping Station. Flows in excess of the Nevins Street Pumping Station's capacity (2 MGD) are directed by regulators along the Nevins Street sewer to the four outfalls, where they are discharged.

OWLS HEAD WWTP SERVICE AREA

The OH WWTP's service area is located in the western section of Brooklyn. As shown on **Figure S-1**, the portion of the Canal's sewershed within the OH WWTP's service area is located to the east of the Canal. Flow from this area is directed to the OH WWTP for treatment. During certain wet weather events, up to five CSO outfalls discharge to the Canal from the OH service area (see **Figure S-7**). Outfall OH-007 discharges the greatest amount of combined sewer flow, as measured by typical year activation frequency and overflow volume. OH-007 is located on the west side of the waterway and discharges just below the 4th Street Turning Basin.

The OH-007 outfall receives flow from two major sewers, which run parallel to each other along 4th Avenue, between 7th Street and Carroll Street (see **Figure S-9**). The two sewer lines flow by gravity and combine at 7th Street into a combined sewer that extends southward to the North Interceptor. Two weirs are associated with OH-007. The first weir is located at the upstream (north) end of the combined sewer at 7th Street and 3rd Avenue. This weir diverts excess flow to a relief pipe and the OH-007 outfall. The second weir is located at the downstream end of the relief pipe at the OH-007 outfall. The 2nd Avenue Pumping Station is also on the relief pipe. The pumping station pumps a small amount of flow back to the combined sewer, and excess flow discharges via the second weir to a grit chamber (a structure that collects and removes materials such as silt, sand, and gravel and then to the Canal. A tide gate on the OH-007 outfall prevents water in the Canal from backing up into the sewer system.

There are eight additional outfalls that are connected to the same sewer network as OH-007 in the OH WWTP's service area. Four of these outfalls discharge to the Canal; three outfalls (OH-006, OH-024, and OH-026) are located downstream of OH-007; one outfall (OH-005) is located upstream of OH-007. The remaining four additional outfalls (OH-023, OH-002, OH-003, and OH-004) in the OH WWTP's service area discharge to the Gowanus Bay and Upper New York Bay (see **Figure S-7**).

E. DESCRIPTION OF THE PROJECT

The Gowanus Canal CSO Facilities are being designed to collect and retain combined sewer overflow from their respective combined sewer systems, which currently discharge to the Canal. The combined sewer overflow that would be retained in each Facility would be pumped to the respective treatment plants after a wet weather event for treatment.

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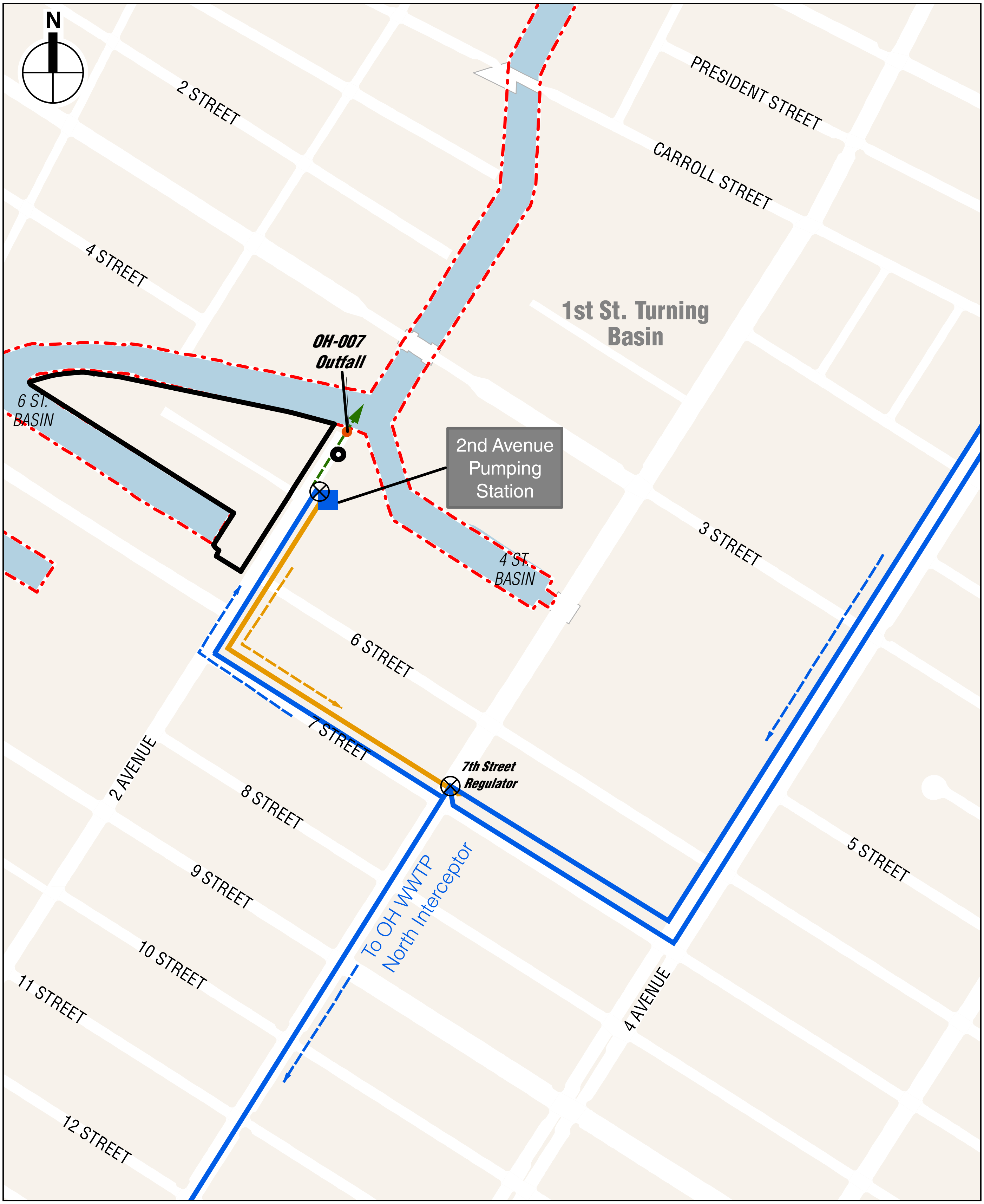


Project Site
Gowanus Canal
Regulator
Major Sewer/ Influent Flow
Force Main/Effluent Flow
Excess Flow
CSO Outfall
Pumping Station
Grit Chamber

0 500 FEET

Owls Head WWTP Service Area Existing Sewer Flows

Gowanus Canal CSO Facilities

Figure S-9

CSO FACILITY OPERATION

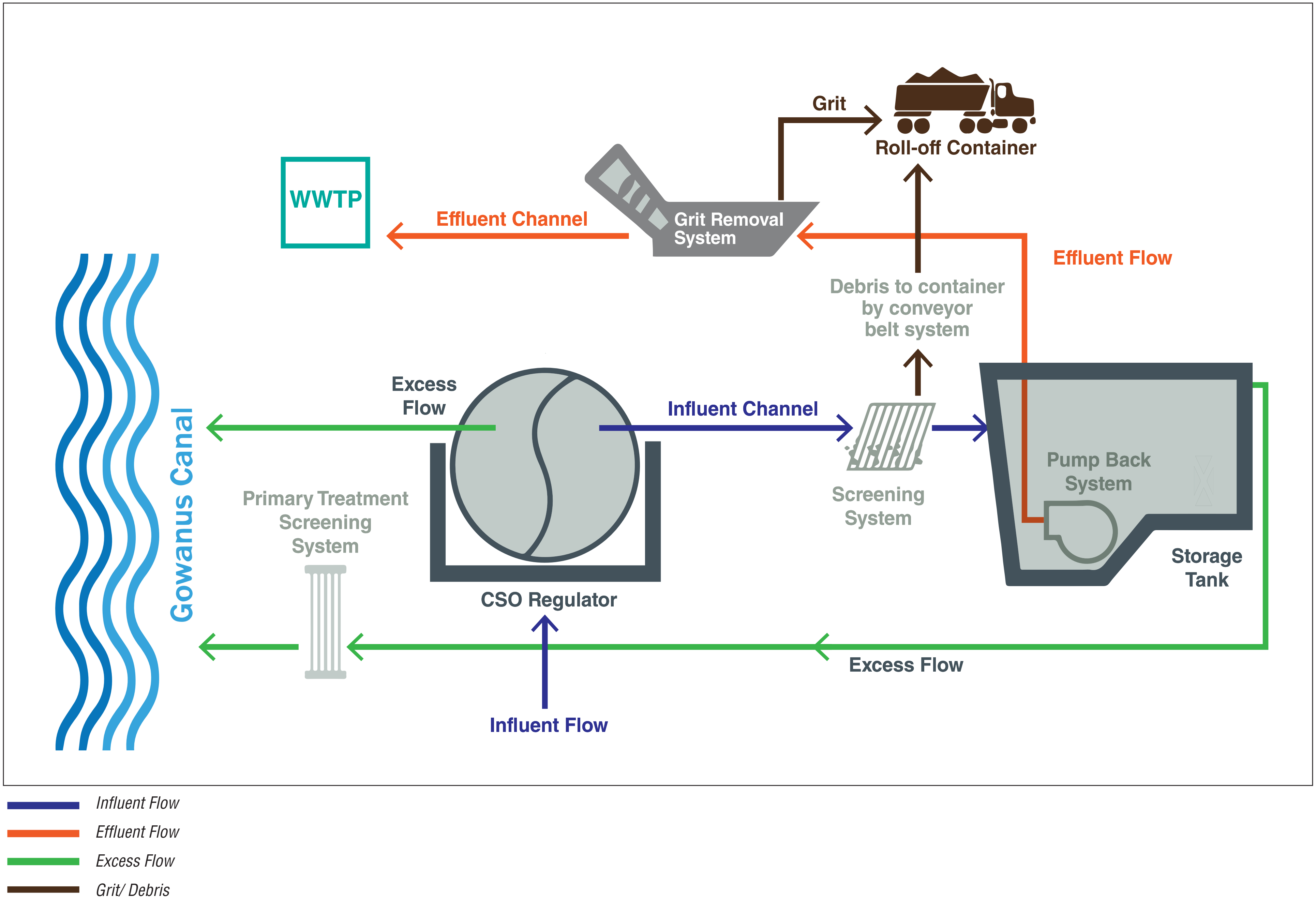
During certain wet weather events, influent flow would be conveyed to the CSO Facilities by gravity, first entering an influent channel and passing through a screening system prior to entering the storage tank (see **Figure S-10**). These screens would remove large debris and protect downstream processes and equipment. The collected debris would be carried via a conveyor belt system to a roll-off container at ground level for direct removal by trucks following the wet weather event. After passing through the screening system, the flow would be held in the storage tanks until there is sufficient downstream capacity to convey the stored flow to either the Red Hook or Owls Head WWTP.

The CSO Facilities would be designed with the flexibility to operate for either sequential filling or parallel filling of the storage tanks, and would be accessible to workers to perform cleaning and maintenance through a series of access hatches on the tank surface. With sequential filling, influent flows would most frequently fill the first storage cell during wet weather events. To fill sequentially, gates from the common influent channel or the wet well to the storage cells would be closed except for the gates to the first storage cell; flow would then continue through the first storage cell before spilling over weirs to the next, subsequent storage cell. Any storage cell could be isolated from the influent channel by closing the influent gates and placing stop logs (long, rectangular beams placed on top of each other to control the flowrate into the storage cell) on the weirs on either side of the isolated storage cell, thereby allowing the remaining storage cells to continue to fill in parallel mode. Sequential filling decreases the need for maintenance of the whole facility since only the screening area and the minimum number of cells would need to be cleaned after a wet weather event and avoids the need to take the whole facility offline. Conversely, the Facilities could be configured to fill in parallel by opening the gates from the common influent channel or the wet well and allowing flow to fill each storage cell simultaneously.

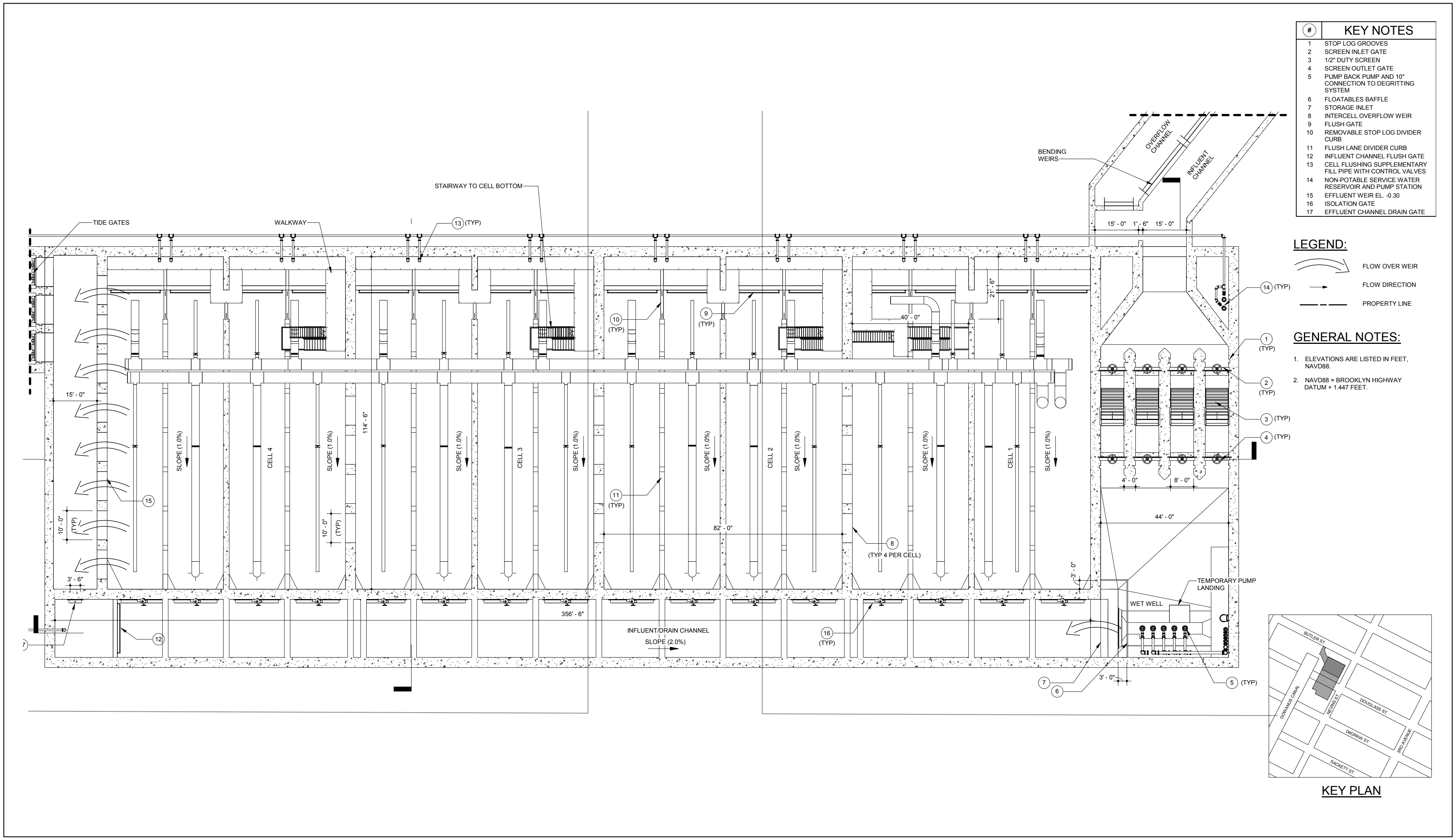
Once there is sufficient capacity in the sewer system and at the WWTP, the stored flow would be pumped from the storage tanks and as the tanks are emptied, accumulated solids in the storage cells would be flushed out. The flushing system would use influent water, stored in a separate ~~grid/~~pump back wet well, as the flush water. Flows from the pump back system would then pass through a degritting system, consisting of a combination cyclone/classifier system to remove materials such as silt, sand, and gravels (commonly referred to as “grit”). The grit would be removed via the cyclones and cleaned via service water (water originating from the potable water supply or clarified CSO) and would be discharged directly to the same roll-off container that receives discharges from the screening system. Flow that passes through the degritting system would then be ~~pumped back~~conveyed to the sewer system. The pump-back system would be sized to return the full contents of the storage tanks (i.e., 8-MG at the Head End Facility and 4-MG at the Owls Head Facility) within 24 hours following a wet weather event to reduce the potential for odors and to allow the storage tanks to receive additional flow.

HEAD END FACILITY

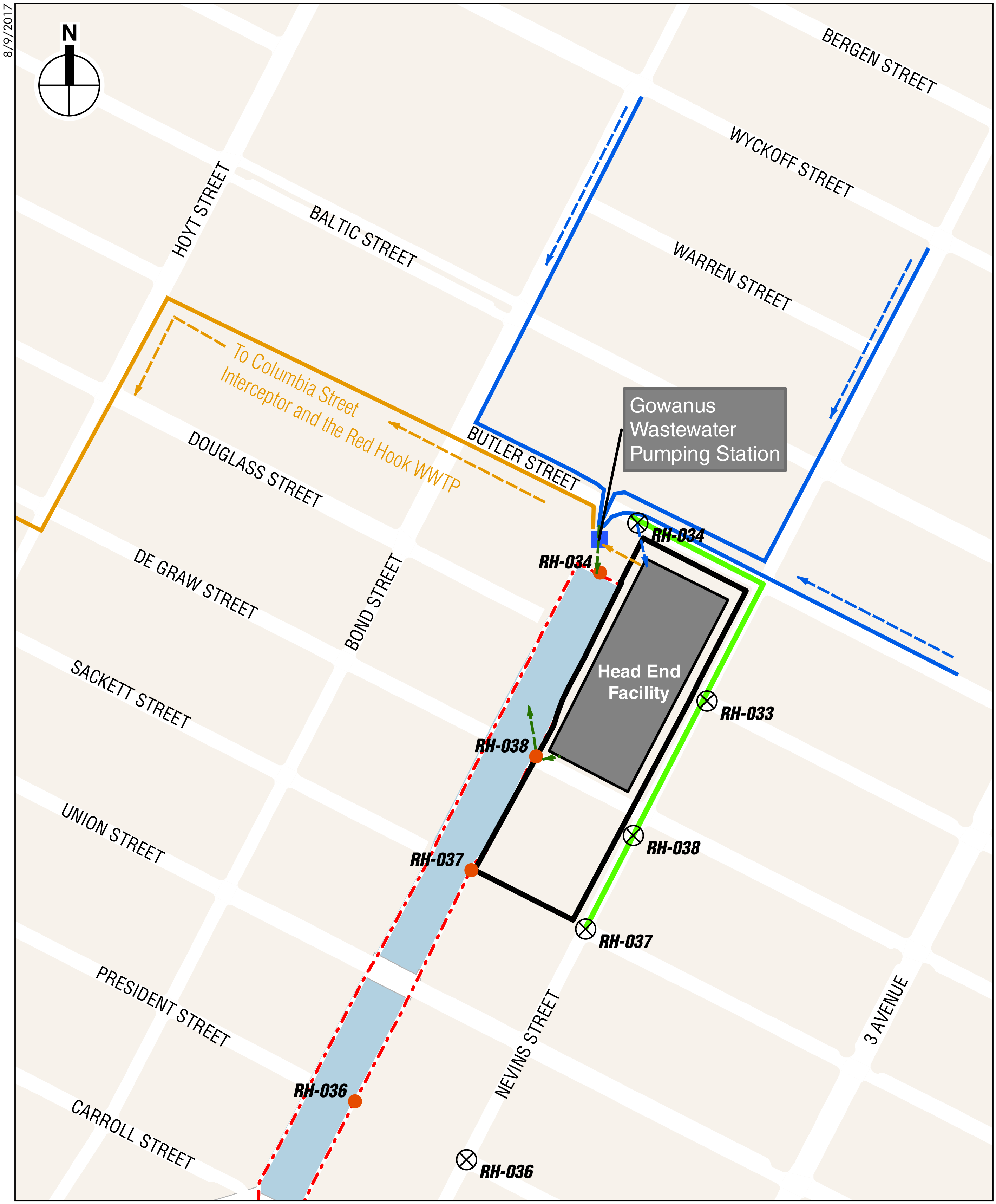
Influent wet weather flows would be directed to the Head End Facility and captured in an approximately 52,000-square-foot (sf) below-grade structure containing the 8-MG tank and tank system (see **Figure S-11**). In order to divert the flow from the RH-034 outfall to the Head End Facility, modifications would be made to the existing RH-034 regulator structure, including the installation of new bending weirs and replacement of the tide gates. Routing of additional sewer system flows to the Head End Facility, including wet weather flows from adjacent outfalls (RH-033, RH-037, RH-038, and RH-036), would be accomplished by constructing a new sewer on Nevins Street from the intersection with Sackett Street to the intersection with Butler Street (see **Figure S-12**). In addition, the associated CSO regulators for these outfalls, located in Nevins Street, would be completely upgraded. Outfalls RH-037 and RH-036, together with outfall RH-034 would remain open and would still be used during high intensity rainfall events.



CSO Facility Process Flow Diagram
Figure S-10



Head End Facility
Below Grade Structure



Project Sites
Gowanus Canal
Regulator
Major Sewer/ Influent Flow
Force Main/Effluent Flow
Excess Flow
CSO Outfall
Pumping Station
In-street Sewer Line Improvements

Gowanus Canal CSO Facilities

Head End Facility
Flow Diversion
Figure S-12

Outfall RH-033, which is located on the Head End Site, would be closed. The Nevins Street Pumping Station and force main would be eliminated and the outfall pipe for the RH-038 outfall (on Degraw Street between the intersection with Nevins Street and the Canal) would be relocated. Flow from the Head End Facility would be pumped to the Gowanus Wastewater Pumping Station for delivery to the Red Hook WWTP once there is sufficient downstream capacity in the sewer system.

The flow-through design capacity for the Facility is 323 MGD. During wet weather events, if flows to the Facility are within the design capacity of the Facility (i.e., up to 323 MGD), after the 8-MG tank is full (i.e., when flow exceeds the 8-MG capacity of the tank), flow would continue to be directed to the Facility. The excess flows would pass through the Facility and would discharge via effluent weirs to an effluent channel that receives limited primary treatment via screening and settling. The excess flows would then be discharged to a new conduit in Degraw Street to the RH-038 regulator and outfall and to the Canal. The flow stored in the 8-MG tank would continue to be discharged to the sewer system and to the Red Hook WWTP following the wet weather event. Influent wet weather flows that exceed the 8-MG capacity of the tank are expected to occur less than 20 percent of the typical year storm events at the Head End Facility (approximately six times per year, out of approximately 40 to 50 wet weather events per year). During wet weather events that result in flows exceeding the design capacity of 323 MGD, excess flows would be diverted upstream of the Facility and would discharge via bending weirs to an overflow channel and into the Canal through the existing RH-034 outfall. The CSO volume discharged from outfall RH-034 during a typical year is expected to be reduced by approximately 76 percent, from 137 MG to 33 MG.

In addition to the below-grade structure, the Head End Facility would also include an approximately 25,700 sf, two-story above-grade structure located at the northern end of the site, with the remainder of the surface area on the site expected to be paved and accessible for maintenance and operations with landscaping and open space where appropriate. The design would include a 50-foot setback from the bulkhead wall, and would provide some form of waterfront publicly accessible open space (see **Figure S-13**). The surface layout of the Head End Site is currently being designed; the design of additional public access areas and/or public amenities provided on the site will be subject to review by New York City Parks and Recreation (NYC Parks), which includes consultation with the local community and other City agencies.

The above-grade structure would house the screening equipment, electrical equipment, an odor control system, ~~an emergency generator,~~ and crew areas.

DEP would provide an odor control system at the Head End Facility to control any potential odors from facility operations and would utilize activated carbon to adsorb odorous compounds within the Facility before being exhausted to the atmosphere. The odor control system is expected to operate continuously (i.e., 24 hours a day) and would be designed to meet the New York State ambient air quality standard for hydrogen sulfide and the *CEQR Technical Manual* criteria to control both odors and hydrogen sulfide from wastewater processes. ~~An emergency generator, consisting of a 1,100 kilowatt (KW) diesel fired generator, would be provided for critical power needs in the Facility to protect against major blackouts or shutdowns of the utility system. The emergency generator would be designed to meet all applicable federal, state, and local air quality emissions requirements and regulations.~~ All mechanical systems in the Facility would be designed with redundancy measures: in particular, backup measures would be provided to maintain odor control systems during a localized power outage and to maintain operations during maintenance activities. Following publication of the DEIS, the design of the CSO Facilities was refined and now includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. Based on this modification, the design no longer includes emergency generators.

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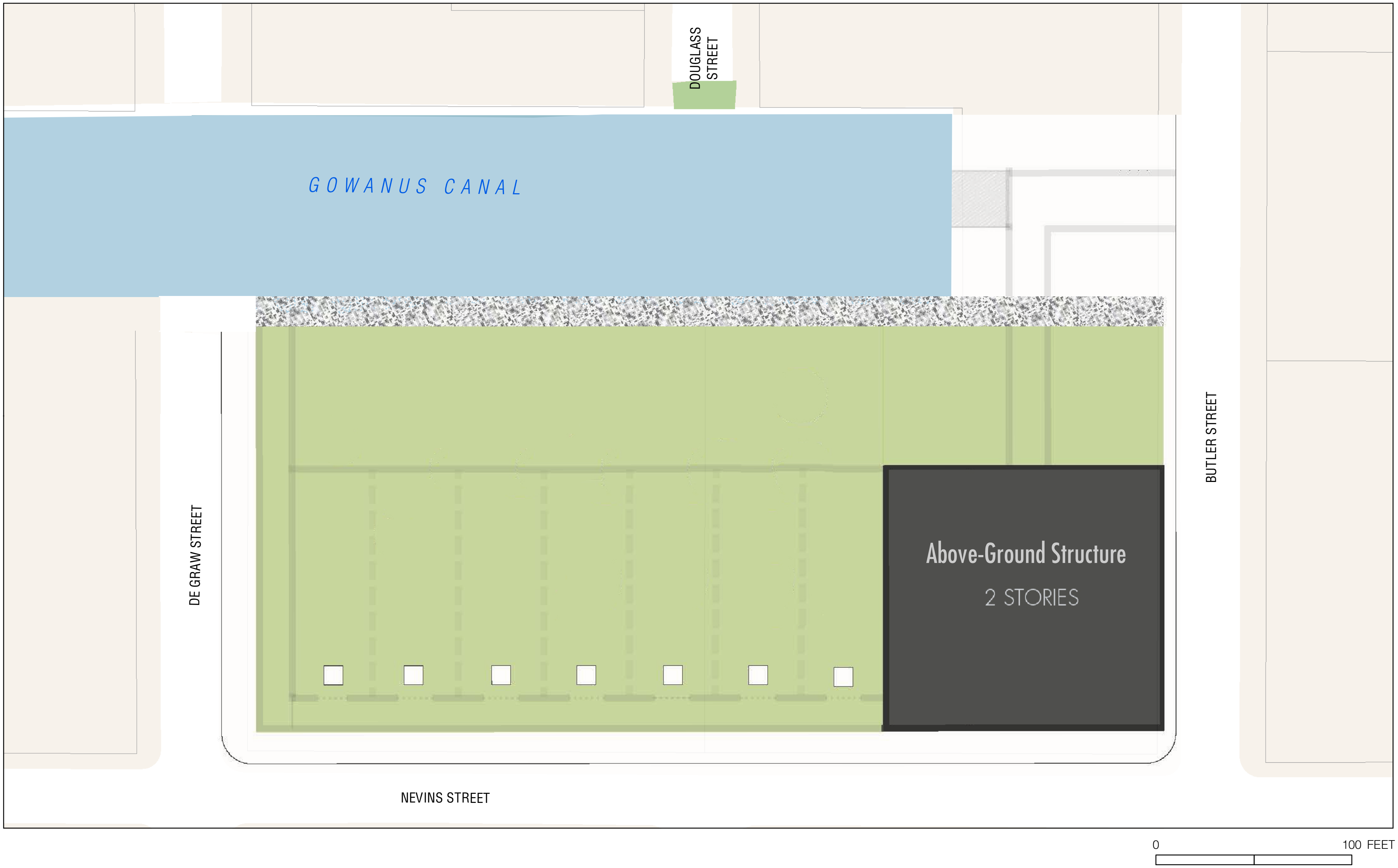


Gowanus Canal CSO Facilities

Head End Facility Site Plan

Figure S-13

The Head End Facility would be largely automated and would not require permanent staffing. Wet weather events initiating facility operation are expected to occur approximately 40 to 50 times per year, and overflow events (where excess flows would pass through the Facility and receive primary treatment before being discharged into the Canal) are expected to occur infrequently, approximately six times per year at RH-034. During operation of the Facility, up to two personnel would be on site to monitor and manage equipment operations and perform regular maintenance. Following a wet weather event, typical activities at the Facility would include general housekeeping and inspection, as well as removal of the screenings/grit roll-off container. Following inspection, additional activities such as clearing debris from the tanks or repairs may be performed as needed.

Construction of the Head End Facility would be divided into three construction phases (CP-1, CP-2, and CP-3) to facilitate the sequence of work and the construction activities by others. DEP construction activities at the Head End Facility are expected to take approximately seven years, with additional time expected to be required for site remediation by National Grid.

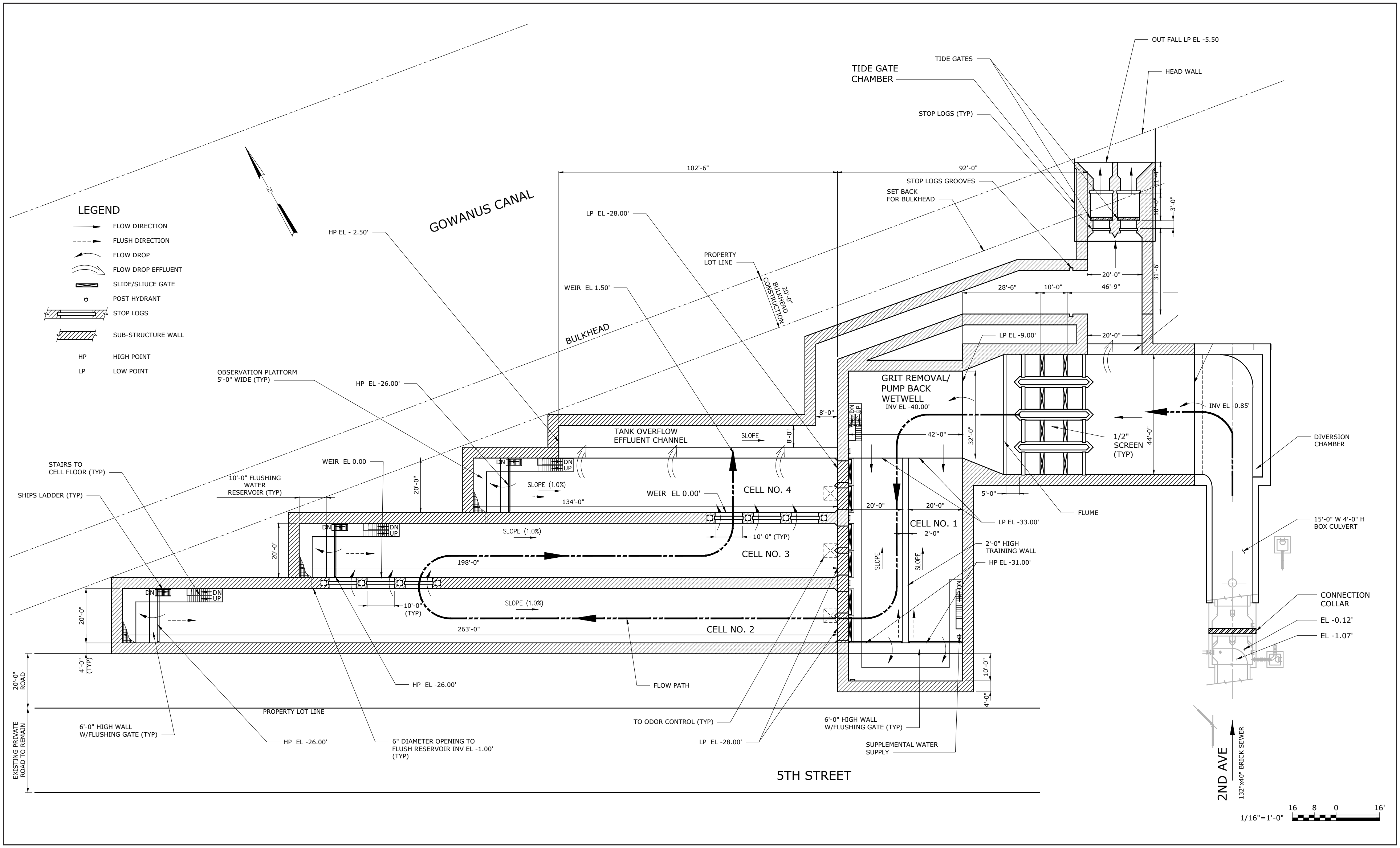
- CP-1 includes site preparation, utility relocation, and demolition. The construction duration for CP-1 is up to nine months.
- Following demolition, there would be work conducted by others at the Head End Site. In particular, it is expected that National Grid would replace portions of the Canal bulkhead, install the cutoff wall, and excavate and remove MGP-related contamination outside the perimeter of the CSO Facility. This construction activity, independent of the Project, is expected to last up to one year.
- CP-2 would begin following the completion of National Grid's work at the Head End Site, and includes the support of excavation (SOE) construction, site excavation, and construction of the below-grade structures. The construction duration for CP-2 is up to 48 months.
- CP-3 includes the construction of the above-grade structures, conveyances, and outfalls, and would have a construction duration of up to 24 months.

OWLS HEAD FACILITY

Wet weather influent flows would be directed to the Owls Head Facility and captured in an approximately 31,000-sf below-grade structure containing the 4-MG tank and tank system (see **Figure S-14**). In order to capture the total design flow rates required for the Owls Head Facility and to direct the flow to the new Facility, the existing 2nd Avenue regulator, located just north of the 2nd Avenue and 5th Street intersection, would be replaced with a new 2nd Avenue regulator. Other existing sewer infrastructure, including the existing grit chamber, outfall (OH-007, located at the end of 2nd Avenue), and the 2nd Avenue Pumping Station located adjacent to the site, would be demolished and removed. A new outfall and a new, similar pumping station with a 1 MGD capacity would be constructed within the Owls Head Facility. In addition, the existing bulkhead at the Owls Head Facility would be replaced by DEP (see **Figure S-15**).

Flow from the Owls Head Facility would be ~~pumped~~ conveyed to the Owls Head Interceptor through an existing regulator located at the intersection of 3rd Avenue and 7th Street. A new force main would be constructed to connect the Owls Head Facility to the Owls Head Interceptor for delivery of flow to the Owls Head WWTP once there is sufficient downstream capacity in the sewer system.

The flow-through design capacity for the Owls Head Facility is 146 MGD. During wet weather events, if flows to the Facility are within the design capacity of the Facility (i.e., up to 146 MGD), after the 4-MG tank is full (i.e., when flow exceeds the Facility's 4-MG capacity), flow would continue to be directed to the Facility, but would pass through the Facility and would discharge via effluent weirs to an effluent channel, which receives limited primary treatment via screening and settling. The excess flows would



Owls Head Facility
Below Grade Structure

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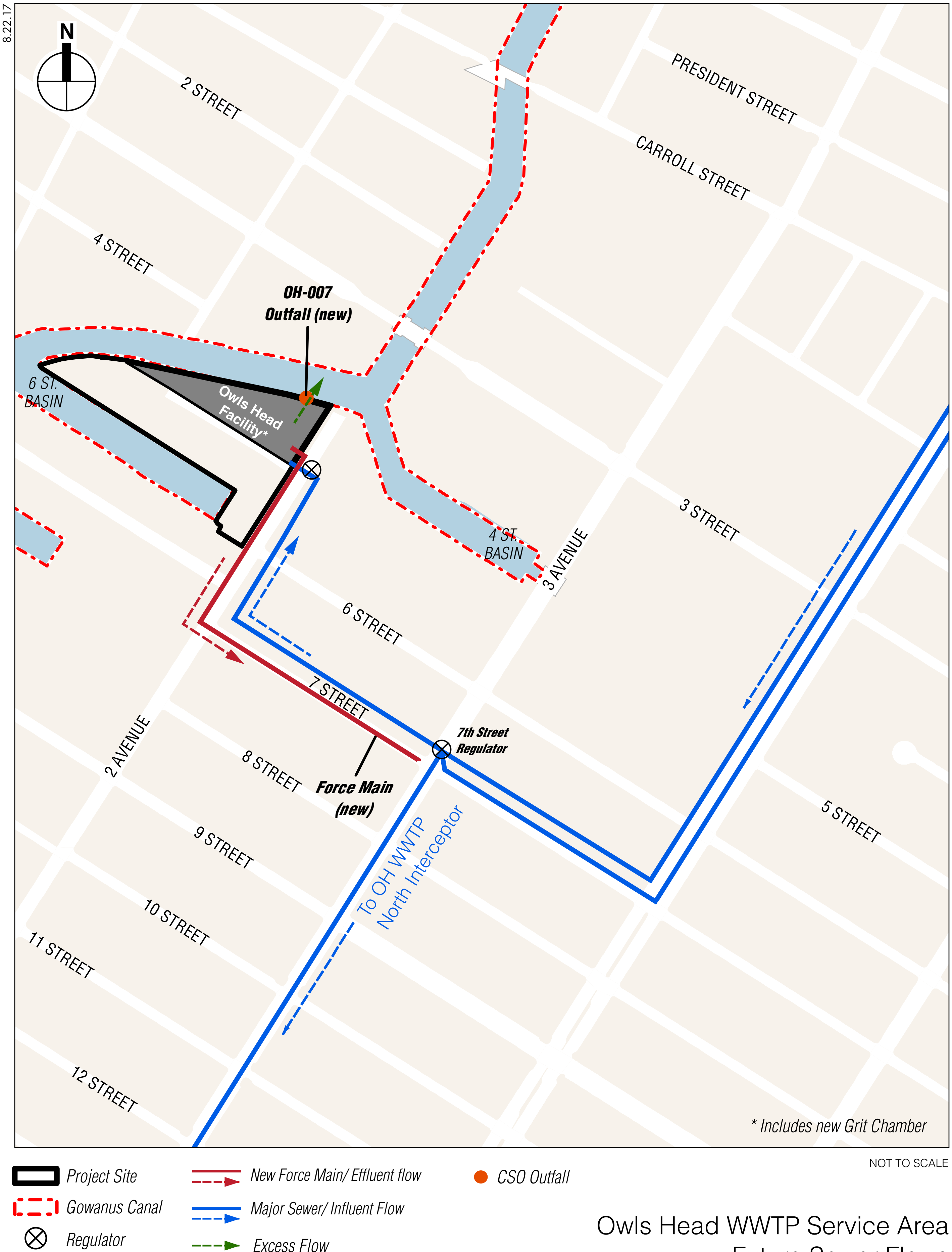

Gowanus Canal CSO Facilities

Owls Head WWTP Service Area
Future Sewer Flows

Figure S-15

then be discharged through the new OH-007 outfall to the Canal. The flow stored in the 4-MG tank would continue to be discharged to the sewer system and to the Owls Head WWTP following the wet weather event. The existing outfall would remain in service during construction and would be closed off once the Owls Head Facility is operational. A tide-gate system would be installed to prevent the Canal from backing up into the tank or the new 2nd Avenue Pumping Station. Influent wet weather flows that exceed the 4-MG capacity of the tank are expected to occur less than 10 percent of the typical year storm events at the Owls Head Facility (approximately five times per year, out of approximately 40 to 50 wet weather events per year). As with the Head End Facility, during wet weather events that result in flows exceeding the Facility's design capacity of 146 MGD, excess flows would be diverted upstream of the Facility and would discharge via a ~~bending~~ weir located in the influent channel to the Canal through the new OH-007 outfall. The CSO volume discharged from outfall OH-007 during a typical year is expected to be reduced by approximately 85 percent, from 58 MG to 9 MG.

In addition to the below-grade structure, the Owls Head Facility would also include an approximately 17,600 sf, two-story above-grade structure. A portion of the site (Block 977, Lot 3) contains a New York City Department of Sanitation (DSNY) facility that would be incorporated at the Owls Head Facility; the property is also used periodically by a local non-profit environmental group, the Gowanus Canal Conservancy (GCC), for environmental education and stewardship events, including composting operations. The five parcels where the Project would be located would accommodate both the existing DSNY facility and the Owls Head Facility, and could also be accessible for GCC activities following construction of the Owls Head Facility. The remainder of the site is expected to be paved and accessible for maintenance and operations with landscaping where appropriate (see **Figure S-16**). DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility.

The above-grade structure would house the screening equipment, electrical equipment, and an odor control system~~, an emergency generator, and crew areas~~. As with the Head End Facility, a continuously operating odor control system utilizing activated carbon would be provided at the Owls Head Facility to control any potential odors from facility operations. ~~An emergency generator, consisting of a 650 KW diesel-fired generator, would be provided for critical power needs in the Facility to protect against major blackouts or shutdowns of the utility system.~~ As with the Head End Facility, all mechanical systems in the Facility would be designed with redundancy measures: in particular, backup measures would be provided to maintain odor control systems during a localized power outage and to maintain operations during maintenance activities. Following publication of the DEIS, the design of the CSO Facilities was refined and now includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. Based on this modification, the design no longer includes emergency generators.

As with Head End Facility, the Owls Head Facility would be largely automated and would not require permanent staffing. The Facility is expected to be in operation approximately 40 to 50 times per year, and overflow events are expected to occur infrequently, approximately five times per year at OH-007. During operation of the CSO Facility up to two personnel would be on site to monitor and manage equipment operations and perform regular maintenance. Following a wet weather event, typical activities would include general housekeeping and inspection, as well as removal of the screenings/grit roll-off container. Following inspection, additional activities such as clearing debris from the tanks or repairs may be performed as needed.

Construction of the Owls Head Facility would be divided into three construction phases (CP-1, CP-2, and CP-3). DEP construction activities at the Owls Head Facility and the potential relocation of the existing DSNY facilities on the Owls Head Site are expected to take approximately seven years.

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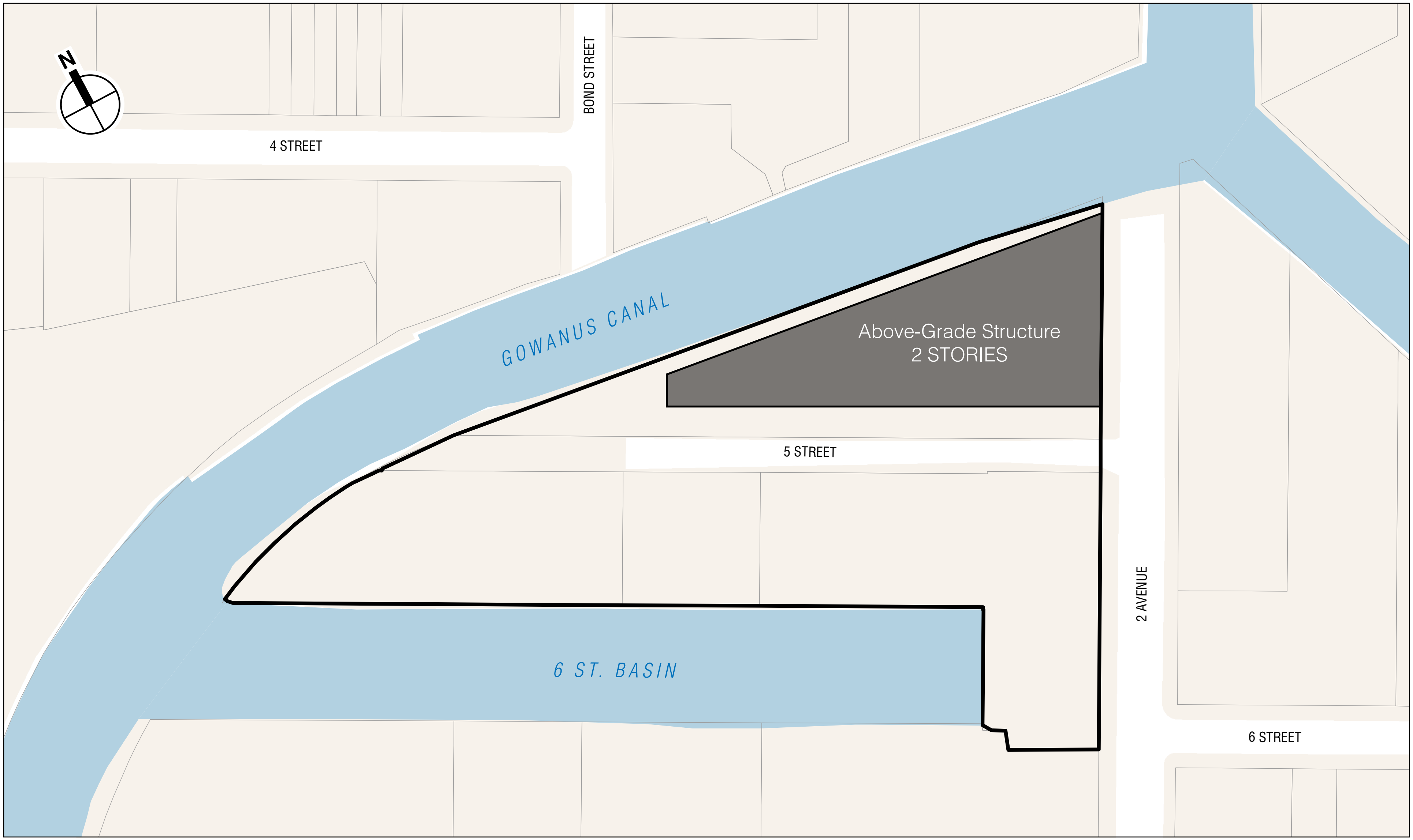

Project Sites

NOT TO SCALE

Gowanus Canal CSO Facilities

Owls Head Facility Site Plan

Figure S-16

- CP-1 includes site preparation, utility relocation, and demolition. The construction duration for CP-1 is up to nine months.
- CP-2 includes the SOE construction, site excavation and construction of the below-grade structures. The construction duration for CP-2 is up to 48 months.
- CP-3 includes the construction of the above-grade structures, conveyances, outfalls and bulkhead improvements and would have a construction duration of up to 24 months.

F. PURPOSE AND NEED

The purpose and need of the Project is to comply with the USEPA ROD requirement to construct the two CSO Facilities described herein. Upland sources of hazardous substances, including discharges from three former MGPs, CSO, and specified contaminated upland areas and unpermitted pipes along the Canal, must be addressed prior to the commencement of, or in phased coordination with, the implementation of the selected remedy.

To support the construction of the Head End Facility, DEP must acquire two parcels located at 242 Nevins Street and 234 Butler Street (the Head End Canal-side Property) to accommodate the Head End Facility, and lease or acquire one parcel located at 270 Nevins Street to use as a construction staging area (RH-034 Staging Area Property). To support the construction of the Owls Head Facility, DEP must acquire up to four parcels located at 110 Fifth Street, 122 Fifth Street, 22 2nd Avenue, and 5th Street (Owls Head Staging Area Property) adjacent to the Canal.

Although DEP is seeking ULURP approval for site selection and acquisition for both of the sites, DEP will undertake ULURP at different times based on their independent design and construction schedules. For the Head End Facility, in addition to the ULURP approval for site selection and acquisition, DEP will be pursuing a ULURP approval for an amendment to the City Map involving the elimination of Douglass Street between the Canal and Nevins Street. This demapping is not necessary for the project, but reflects that, with the acquisition of the property and the construction of the Head End Facility, the street would not be built), and the ULURP for demapping will follow the ULURP for site selection and acquisition. Similarly, for the Owls Head Facility, the ULURP would include an amendment to the City Map involving the elimination of 5th Street between 2nd Avenue and the Canal.

G. PROJECT APPROVALS AND COORDINATION

Implementation of the Project would require federal, state and local permits/approvals, or their equivalents under CERCLA. DEP would closely coordinate with USEPA, NYSDEC, New York State Department of State (NYSDOS), New York State Parks, Recreation and Historic Preservation (OPRHP), and New York City agencies as necessary for the Project.

Table S-1 includes the major permits, approvals, or their equivalents under CERCLA that may be required for the Project.

Table S-1
Potential Major Permits, Approvals or Equivalents, Consultation, and Coordination[1]—Gowanus Canal CSO Facilities

Agency/Entity	Permit/Approval/Consultation/Coordination
FEDERAL	
U.S. Environmental Protection Agency (USEPA)	CERCLA coordination and consultation
Coastal Zone Management Act	Projects affecting New York's coastal zone must be consistent with the Coastal Zone Management Act, through the New York State Department of State's Coastal Management Program and approved Local Waterfront Revitalization Plans
U.S. Army Corps of Engineers (USACE)	Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act
National Marine Fisheries Service (NMFS)	Consultation with NMFS
United States Fish and Wildlife Service (USFWS)	Consultation under Section 7 of the Endangered Species Act; Biological Assessment; Federal Fish and Wildlife Permit
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act of 1966
STATE	
New York State Department of State (NYSDOS)	Coastal Zone Management Consistency
New York State Department of Environmental Conservation (NYSDEC)	State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity - GP-0-10-001: erosion and sediment control and post-construction stormwater management in accordance with the stormwater pollution prevention plan (SWPPP)
	Individual SPDES Permit or Application Form NY-2C for Industrial Facilities (Dewatering activities requiring discharge to surface water)
	Modification to a SPDES Permit (Individual Permit) for Discharge of Wastewater from Publicly Owned Treatment Works (NY-2A) to remove inactive outfalls
	Tidal Wetlands Permit
	Long Island Well Permit and Approval of Completed Works
	Protection of Waters Permit Navigable Waters (Excavation or Fill)
	Section 401 Water Quality Certification
	Natural Heritage Program Consultation—consultation to determine potential presence of threatened or endangered species listed in New York State
New York State Office of Parks, Recreation and Historic Preservation (OPRHP)	Consultation to determine potential presence of archaeological and/or historic resources and determine project's potential effects
NEW YORK CITY	
New York City Department of City Planning (DCP)	ULURP for site selection, property acquisition, an amendment to the City Map (street demapping for due diligence – not required to build the Project)~~.~~
	New York City Waterfront Revitalization Program—Consistency Assessment
New York City Department of Small Business Services (SBS)	Permitting for waterfront construction

Note:
[1] Includes documentation of regulatory compliance under CERCLA through equivalent review by responsible agencies.

H. SCOPE AND METHODOLOGY OF THE ENVIRONMENTAL IMPACT STATEMENT

The purpose of the EIS is to provide a discussion of the potential significant adverse environmental impacts associated with implementation of the Project and to the maximum extent practicable, avoid or mitigate such impacts, consistent with social, economic, and other essential considerations. The 2014 *CEQR Technical Manual* has been used to evaluate the Project's impacts.

Each impact analysis includes an inventory of existing conditions establishing a baseline against which future conditions can be projected (Existing Condition). In addition, each impact analysis includes a determination of future conditions known to occur or expected to occur in the future regardless of the Project (Future Conditions in the Analysis Year or the Future without the Project). Clean-up activities required by USEPA or NYSDEC of other parties, such as the installation of the containment/cutoff wall, the excavation or stabilization of MGP-related contamination on shared parcels, the dredging of the Canal, the restoration of the 1st Street and 4th Street turning basins, and the installation of coal tar extraction wells, are presented as part of the Future Conditions in the Analysis Year. Finally, each impact analysis includes an analysis of the Project's likely effects on its environmental setting (Probable Impacts of the Project) in the expected year of completion (Analysis year). The Project's expected year of completion is 2028.

The EIS contains:

- A description of the Project and the environmental setting;
- A description of the methodologies utilized for each technical area;
- A statement of the potential significant adverse environmental impacts of the Project;
- An identification of any potential significant adverse impacts that cannot be avoided if the Project is implemented;
- An identification of irreversible and irretrievable commitments of resources that would be involved if the Project is built; and
- A description of measures proposed to minimize or fully mitigate any potential significant adverse environmental impacts.

The methodologies utilized for each analysis are presented in each technical area's respective chapter. Where applicable, the EIS presents a comparative analysis of feasible alternatives in order to examine reasonable and feasible options that avoid or reduce potential, project-related significant adverse impacts while still achieving the stated goals and objectives of the Project. In most cases, a No Action Alternative (i.e., examining the impacts of not undertaking the action being reviewed) must be included in an EIS. However, since the USEPA ROD requires the City to construct two CSO Facilities, a No Action alternative is not evaluated as part of the EIS.

The EIS, though not considering a No Action Alternative, contains other alternatives analyses. As discussed above, if the land at the Head End Canal-side Property cannot be acquired within the allotted timeframe (per the Settlement Agreement[6]), USEPA may direct that the Head End Facility be constructed at the Thomas Greene Playground, located to the east of the Head End Site across Nevins Street (Block 419, Lot 1). Therefore, the alternatives analysis for the Head End Site considers locating the Facility on a portion of the Thomas Greene Playground.

As the City is not under a USEPA order directing the City to construct the Owls Head Facility at the preferred location, the analysis includes a discussion of an alternative to the City's preferred location. In particular, this section considers the alternative location to the east of the Owls Head Site along 6th Street (Block 979, Lots 18 and 23). This site was identified as a possible alternative to the proposed site in a Siting and Planning Study performed by the City.

The analyses of project alternatives are presented ~~below~~ in "Alternatives."

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[6] USEPA. "Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery," June 2016, USEPA Region II, New York, NY: p.37.

I. PROBABLE IMPACTS OF THE PROJECT

LAND USE, ZONING, AND PUBLIC POLICY

LAND USE

Head End Site

The Head End Facility would be part of the extensive sewer infrastructure system present in the Head End Study Area around the Canal—which includes pumping stations, regulators, CSO outfalls, and the DEP Gowanus Wastewater Pumping Station immediately to the west of the Head End Site—and would be compatible with the existing sewer infrastructure in the study area. Similarly, the Head End Facility would be compatible with the other nearby uses within the study area, including distribution/warehouse, light industrial, and commercial and residential uses, with an increasing commercial component (office and hotel uses) that is expected to be developed by the 2028 analysis year. In particular, the Head End Facility would not conflict with residential uses in the Head End Study Area, including the multi-family apartment building and artists' lofts at 282 Nevins Street (the residential use nearest the Head End Site). With the use of an odor control system, which is expected to operate continuously (i.e., 24 hours a day) and would be designed to meet the New York State ambient air quality standard for hydrogen sulfide and the *CEQR Technical Manual* criteria to control both odors and hydrogen sulfide from wastewater processes, as well as mechanical equipment located either indoors or below grade, operation of the Head End Facility would not result in disturbances at nearby residential uses due to odors or noise. Similarly, operation of the Head End Facility would not have an effect on the adjacent Thomas Greene Playground and would result in the addition of some form of publicly accessible open space along the Canal as compared with the light-industrial and auto-related uses that currently block access to the Canal and, potentially, additional public access areas and/or public amenities that could help stitch together the new public open space and Thomas Greene Playground. As discussed below, the Head End Facility would comply with the applicable M2-1 zoning requirements, and would therefore not result in a non-conforming use within the Head End Study Area. In addition, use of the property as a temporary construction staging area would not pose conflicts to nearby land uses, as it would not result in any permanent facilities on the construction staging area.

Owls Head Site

Similar to the Head End Facility, the Owls Head Facility would be part of the extensive sewer infrastructure system present in the Owls Head Study Area, and would be compatible with existing sewer infrastructure. The Owls Head Facility would also be compatible with the other uses in the Owls Head Study, which are generally light-manufacturing, light-industrial, and commercial uses (the Owls Head Study Area contains fewer sensitive uses, such as residential and open space uses, as compared to the Head End Study Area). Residential uses in the Owls Head Study Area are generally located on the west side of the Canal, including the new higher-density residential development that is partially complete at 385 Bond Street, and would not be affected by disturbances from odors or noise due to operation of the Owls Head Facility. The design of the Owls Head Facility would allow for the existing uses on the Owls Head Site (the DSNY facility and GCC activities) to remain on the site, and may also allow for potential accessible waterfront open space. As with the Head End Facility, the Owls Head Facility would comply with the applicable M2-1 zoning requirements, and would therefore not result in a non-conforming use within the Owls Head Study Area. Overall, the Project would be compatible with existing land uses in the study areas, and would result in no significant adverse land use impacts.

ZONING

In terms of zoning, the CSO facilities, which would collect, retain, and store CSO, are considered to be Use Group 18, similar to other CSO control facilities, such as DEP's Paerdegat Basin CSO facility in Brooklyn. Use Group 18 facilities are permitted uses in the M2-1 zoning district applicable to both the Head End Site and the Owls Head Site.[7] The facilities are designed to meet all applicable zoning requirements; although not required for Use Group 18 facilities under Waterfront Zoning, the design of the Head End Facility would provide some form of waterfront public access and open space, which along with other potential elements of the project will be developed further through the public process and broader planning work ongoing in the area. The Project would not result in any changes to the zoning regulations applicable to the Head End Site, the Owls Head Site, or any other site within the study areas. Therefore, the Project would result in no significant adverse impacts to zoning.

PUBLIC POLICY

The Project would not result in any changes to public policies affecting the Head End Site, the Owls Head Site, or the study areas. The WRP consistency assessment concludes that the Project would be consistent with the policies of the WRP. DCP has reviewed the WRP assessment (WRP No. 16-194) and has concurred that the Project is consistent with WRP policies.

At the Owls Head Site, the Project would result in a CSO facility located in an area that is subject to public policies aiming at the preservation of industrial facilities, in particular the City's Industrial Business Zone (IBZ) program. Construction of the Owls Head Facility would potentially displace four industrial businesses (Warehousing and Transportation industry sector businesses that are currently located on the Owls Head Site). However, the displacement of these businesses is not expected to result in a significant loss of industrial employment or affect business conditions for the other industrial businesses in the area; therefore construction of the Owls Head Facility would not conflict with the City's goal of retaining industrial uses within the IBZ.

As noted previously, both the Head End Facility and the Owls Head Facility require New York City ULURP approval, but will undergo ULURP at different times due to having different design and construction schedules.

For the Head End Facility, the ULURP would include site selection, property acquisition and an amendment to the City Map involving the elimination of Douglass Street between the Canal and Nevins Street. This demapping is not necessary for the project, but reflects that, with the acquisition of the property and the construction of the Head End Facility, the street would not be built and the ULURP for demapping will follow the ULURP for site selection and acquisition. Pursuant to City policy, City capital projects requiring a Site Selection approval must undergo a Fair Share analysis that applies the *Criteria for the Location of City Facilities* (the "Fair Share Criteria" or "Criteria") as set forth in Appendix A to Title 62 of the Rules of the City of New York (RCNY). The consideration of the Fair Share criteria for acquisition of the site concluded that the Head End Facility is consistent with the City's Fair Share policy.

For the Owls Head Facility, DEP is proceeding with the environmental review process and evaluating property acquisition needs and is continuing to develop the Facility and site plans, which will inform the schedule for the acquisition and ULURP processes for the Owls Head Facility.

[7] The uses listed in Use Group 18 are permitted in M1 or M2 Districts if such uses comply with all of the applicable performance standards for such districts (ZR 42-00). As the Facilities would meet or exceed the applicable performance standards for the M2-1 zoning district, they are a permitted use under zoning.

Overall, the Project would not result in any significant adverse impacts to public policy governing the Head End Site, the Owls Head Site, and the study areas.

SOCIOECONOMIC CONDITIONS

At the Head End Site, the Project would require the use of two lots (Block 418, Lot 1 and Block 411, Lot 24) for installation of the CSO facilities, as well as a third lot (Block 425, Lot 1) for construction staging. At the Owls Head Site, the Project would require the use of five lots (Block 990, Lots 1, 16 and 21 and Block 977, Lots 1 and 3). The Project would require the displacement of all uses located on these lots, with the exception of the DSNY salt storage facility and community-sponsored composting program on Block 977, Lot 3, which would remain on the site; currently, there are 19 businesses operating on the lots. Based on *CEQR Technical Manual* guidance, analysis of the Project in the following three areas of socioeconomic conditions is warranted: direct business displacement; indirect business displacement; and potential adverse effects on specific industries. Overall, the Project would not result in any significant adverse socioeconomic impacts. This is because individually and collectively, the 19 businesses that could be directly displaced do not provide products or services essential to the local economy that would no longer be available to local residents or businesses in their “trade areas.” It is also because the businesses could be expected to relocate or establish new, comparable businesses elsewhere. The 19 businesses do not constitute a category of businesses or institutions that may be the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it. Their displacement would not significantly affect business conditions in any industry or any category of business within or outside the study area.

COMMUNITY FACILITIES

The Project would not have a direct effect on community facilities because neither the Head End Facility nor the Owls Head Facility would physically displace any on-site community facilities. A portion of the Owls Head Site currently contains a DSNY facility, which would be accommodated on the site along with the Owls Head Facility. In addition, the DSNY-controlled portion of the Owls Head Site is used periodically by a local non-profit environmental group, the GCC, for periodic environmental education and stewardship events, including composting operations. During construction of the Owls Head Site the DSNY’s road salt and plow storage may be relocated within a portion of the site and therefore would not be adversely affected by the Project. While access to the composting facility and GCC activities may be displaced during construction, once the Owls Head Facility is operational, access for these activities could be restored and therefore would not be adversely affected by the Project. Further, the Project would not result in new residential development and would not introduce a new residential population to the study areas that could result in indirect effects by increasing demand for community facility services. Therefore, the Project would not have a significant adverse impact on community facilities, and no further analysis is necessary.

OPEN SPACE

Overall, the Project would not result in the permanent loss of or alteration to any existing open space, and operation of the Project would not result in any permanent effects from noise, air pollutants, odors, or shadows which would adversely affect the usefulness of the adjacent open spaces or recreational resources. In particular, public enjoyment of the open space and recreational resources located near the Head End Facility and the Owls Head Facility (the Thomas Greene Playground, the Whole Foods Market waterfront public access area [WPAA], and the Gowanus Canal) would not be adversely affected. Furthermore, at the Head End Site, it is anticipated that some type of publicly accessible open space would be developed as part of the Project; as noted above, the surface layout of the Head End Site is currently being designed and public access areas provided on the site will be determined through additional facility design in consultation with the local community and other City agencies, including NYC Parks. The analyses of the Project's effects on this Project-generated open space concluded that there would be no significant adverse impacts from shadows, air pollutant emissions, odors, or noise. DEP is also evaluating the potential for the site to include accessible waterfront open space at the Owls Head Site where it does not interfere or conflict with the operation of the Owls Head Facility. Therefore, the operation of the Project would result in open space improvements to the area, and would not result in any significant adverse direct impacts on open space. The Project's effects on nearby open spaces during construction of the CSO facilities, including effects on open space resulting from increased noise, air pollutants, odors, and construction-related traffic, are discussed below in "Construction."

SHADOWS

Given the height of the above-grade structures and their locations adjacent to sunlight-sensitive resources a shadow assessment was conducted that focused on the interaction between the Project's above-grade structures and the shadows they may cast on sunlight-sensitive resources of concern, which include publicly accessible open space, sunlight-dependent features of historic resources, and natural areas that depend on sunlight. In particular, the Canal is considered a sunlight-sensitive resource both for its use as a recreational open space and as a natural feature that supports fish, benthic invertebrates and plankton.

POTENTIAL INCREMENTAL SHADOW EFFECTS ON RECREATIONAL USES OF THE CANAL

Recreational uses on the Canal, such as fishing and boating,[8] would likely be heaviest in the spring, summer, and fall and much lighter in winter. At the Head End Site, the limited extent and duration of incremental shadows in spring, summer, and fall would not substantially affect recreational use of the Canal. At the Owl's Head Site, incremental shadows in the spring, summer, and fall would be limited in extent and would fall only on small areas of the Canal adjacent to the site. Similar to the Head End Site, the limited areas of incremental shadows would not substantially affect recreational use of the Canal. In winter, although the extent of the incremental shadows would be greater, its effect on recreational use—which is already much lower due to colder temperatures—would not be significant. Moreover, extensive areas of the Canal adjacent to the area affected by incremental shadows would continue to receive direct sunlight and be available to users. Therefore there are no significant adverse shadows impacts on the recreational uses of the Canal.

POTENTIAL INCREMENTAL SHADOW EFFECTS ON AQUATIC HABITAT

Although existing water quality standards are already being met in the Canal, the Project would serve to further improve water quality, thereby helping to improve the aquatic habitat for migratory species that occur in the area. Movement of the Canal waters—from both the natural tidal cycle and the operation of the Flushing Tunnel—carry phytoplankton through existing shaded areas of the Canal. Motile organisms such as fish and epibenthic macroinvertebrates (e.g., crabs) would be expected to move through the incremental shadows resulting from the Project. In addition, the portion of the Canal receiving project-generated shadows is limited relative to the Canal's overall size so the volume of water affected by the incremental shadows would be small. Finally, similar to the other waters of the Upper Harbor, suspended

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[8] Waters in the Gowanus Canal are classified as either Use Class SD (upper section) or Use Class I (lower section), per the Water Quality Classifications, NYS Department of Environmental Conservation, Division of Water, Bureau of Water Assessment and Monitoring. The best usage of Class SD waters is fishing. The best usage of Class I waters is secondary contact recreation which includes, but is not limited to, fishing and boating.

materials in the Canal water would limit light and shadow penetration, further limiting the volume of affected water. Therefore, project-generated shadows would not be expected to affect primary productivity of the aquatic resources (plankton, fish, and benthic invertebrates) in the future with the Project and any potential for a minor hindrance on fish passage within the small band of project-generated shadows cast across the Canal would not be significant.

POTENTIAL SHADOW EFFECTS ON THE PROJECT'S OPEN SPACE

It is anticipated that the Project would include some form of waterfront public access or open space at the Head End Site. The above-grade structure would occupy most of the northern end of the site; therefore, the Project may include some type of open space located primarily to the south of the above-grade structure, and to a small extent, southwest and west of it. Consequently, shadows cast by the above-grade structure would generally not fall far enough to the south to substantially affect the open space at most times of the day throughout the year. If there are any portions of the project-generated open space that would be situated west or southwest of the site, these portions could receive shadows from the above-grade structure during the morning when shadows fall to the west. These portions of the open space would likely be in the sun during the mid-day and afternoon hours. Therefore the Project's open space would not receive substantial shadows for most of the day throughout the year.

HISTORIC AND CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

Head End Site

Ground surface impacts from the Project would consist of excavation associated with construction of the CSO Facility on the Head End Site, as well as excavation in nearby streets associated with related sewer infrastructure. Potential in-street sewer line improvements would be constructed in the vicinity of the Head End Site beginning on Butler Street, north of the site, and continuing southward along Nevins Street to Sackett Street, with some street work on Degraw Street between Nevins Street and the Canal to connect the Head End Facility with the RH-038 outfall. The new sewer would have a diameter of up to 54 inches. Portions of the Head End Site and Nevins Street are sensitive for deeply buried prehistoric and mill-related resources at depths greater than 10 to 15 feet below grade. The Head End Site is also sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature. If these resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact on archaeological resources. Impacts would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with the New York State Historic Preservation Office (SHPO) and the New York City Landmarks Preservation Commission (LPC) (see below). As the Gowanus Canal bulkheads are State and National Register (S/NR)-eligible, modification of the bulkhead at the Head End Site would result in a potential significant adverse impact. Therefore, consultation with SHPO and LPC is being undertaken to identify measures to avoid, minimize, or mitigate adverse impacts.

Owls Head Site

Ground surface impacts from the Project would consist of excavation associated with construction of the CSO Facility at the Owls Head Site. Ground surface impacts are also expected along 2nd Avenue and 7th Street associated with potential in-street sewer line improvements. The Owls Head Site is sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature. Undisturbed portions of the 7th Street streetbed are sensitive for the presence of human remains associated with the Battle of Brooklyn, also known as the Battle of Long Island, which occurred during the Revolutionary War on August 27, 1776. If human burials or the remains of human burials are present on the Owls Head Site, they would likely be disarticulated and in poor condition as a result of historic disturbance and the construction of the utilities currently present on this site. Any remains are expected to be located below 20th century fill layers and modern disturbances. If archaeological resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

As the Gowanus Canal bulkheads are S/NR-eligible, removal and replacement of the bulkhead at the Owls Head Site would result in a potential significant adverse impact. Therefore, consultation is being undertaken with SHPO and LPC to identify measures to avoid, minimize, or mitigate adverse impacts.

Future Archaeological Analyses

Future archaeological analysis is recommended for locations within the area affected by Project construction that have been determined to have a moderate or high archaeological research value. Consultation with SHPO and LPC is ongoing to determine an appropriate course of action for any future archaeological analysis of the Project Sites. Additional research on these potential archaeological resources may be redundant and unwarranted, therefore, an archaeological monitoring plan will be prepared that will identify the horizontal and vertical locations of Project elements that have the potential to impact archaeological resources and will describe monitoring procedures, including an unanticipated discoveries plan. Implementation of this monitoring plan would be sufficient to avoid, minimize, or mitigate adverse impacts of the Project.

ARCHITECTURAL RESOURCES

Project Sites

The Head End and Owls Head Project Sites are both located in the S/NR-eligible Gowanus Canal Historic District. A Gowanus Canal Historic District was proposed for listing on the S/NR by SHPO in 2014. ~~A~~The draft of the National Register of Historic Places Registration (Nomination) Form was prepared by SHPO in December 2013 (the “Draft National Register Nomination Form”). However, in response to community comments, the New York State Board for Historic Preservation review for the State Register listing of the Gowanus Canal Historic District has been postponed and in a letter dated August 28, 2017, SHPO indicated that they had determined the Gowanus Canal Historic District to be S/NR-eligible in 2012. The Draft National Register Nomination Form~~, which~~ indicates that buildings are considered Contributing to the significance of the proposed historic district unless otherwise noted and identifies certain buildings as Non-Contributing to the significance of the proposed historic district in the Resource Inventory.[9] However, the Draft National Register Nomination Form does not make a conclusion regarding the number of Contributing and Non-Contributing buildings. In subsequent consultation, in a letter dated July 3, 2017, SHPO provided updated determinations of S/NR eligibility for the properties on the Project Sites.

Head End Site

The Head End Site currently contains a two-story brick building (234 Butler Street) located at the intersection of Nevins and Butler Streets, with a one-story brick section along Butler Street, and an

[9] Draft National Register of Historic Places Registration Form, Gowanus Canal Historic District, December 2013, Section 7, p.6.

additional one-story brick structure along Nevins Street. The building is the former Gowanus Station, designed in the Beaux Arts Style and originally built in 1914. The Head Site also contains a factory complex of four buildings (242-244 Nevins Street) built between 1905 and 1955, and a one-story warehouse building (270 Nevins Street) that was built ca. 1955. All of the buildings on the Head End Site (excluding a one-story building on the interior of Block 411, Lot 24 that was constructed ca. 1990) have been determined by SHPO to be architectural resources that contribute to the significance of the S/NR–eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that ~~D~~demolition of these S/NR-eligible properties, which is necessary to complete the Project as mandated by USEPA, would constitute a significant adverse impact to architectural resources on the Head End Site and to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. As the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from USACE or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966. Here, the NHPA requires that USEPA take into account the effects of the Project on historic properties and requires consultation with SHPO. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties, USEPA, in consultation with SHPO and the City, will seek ways to minimize or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement. ~~Therefore~~

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to ~~avoid or~~ minimize to the extent practicable the adverse impact that would occur through demolition, as described below. LPC has indicated that they do not identify the buildings on the Head End Site as LPC New York City Landmarks (NYCL)-eligible.

Feasibility of Retention of Buildings at Head End Site and Potential Mitigation

The preferred and proposed layout of the below-grade CSO structure at the Head End Site extends from the property line in the North facing Butler Street, to the property line in the South facing Degraw Street, to the property line in the East facing Nevins Street, and to the USEPA-mandated 50-foot setback from the Canal to the West. This layout provides for a shallower, larger footprint that has key benefits to facility operations and both the construction cost and schedule. DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts-style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, and as discussed above, it is expected that DEP~~-~~, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (~~;~~which ~~this documentation~~ would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential to~~incorporate some salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

Owls Head Site

The buildings on the Owls Head Site are utilitarian structures that are not distinguished architecturally and do not appear to possess any particular historical significance or significant association with the Gowanus Canal. SHPO concurred in their July 3, 2017 letter that the buildings on the Owls Head site are Non-Contributing to the S/NR-eligible Gowanus Canal Historic District. Therefore, demolition of the buildings on the Owls Head Site would have no significant adverse impacts on architectural resources.

Study Area

Head End Site Study Area

Two individually S/NR-eligible architectural resources are located within 90 feet of the Head End Site: the ASPCA Memorial Building and the Former R.G. Dunn and Company Building. To avoid any inadvertent construction-related impacts to these resources during project construction, a Construction Protection Plan (CPP) would be prepared and implemented in consultation with SHPO and LPC and in conformance with the New York City Department of Building's *Technical Policy and Procedure Notice* #10/88. In addition, other properties located within the S/NR-eligible Gowanus Canal are located within 90 feet of the Head End Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken among DEP and SHPO to determine what protection measures may be needed for these properties, if any, during construction of the Project.

Demolition of the buildings at 242-244 Nevins Street, 270 Nevins Street, and the Gowanus Station at 234 Butler Street and associated one-story sections would constitute an adverse impact on the S/NR-eligible Gowanus Canal Historic District. The proposed below-grade CSO Facility and the two-story building would not be expected to have any indirect, contextual impacts on the surrounding architectural resources in the study area as the Project would result in a low-rise industrial facility similar to other properties in the 2014 S/NR-eligible Gowanus Canal Historic District.

Owls Head Site Study Area

There are no individually S/NR-eligible architectural resources within 90 feet of the Owls Head Site. Properties located within the 2014 S/NR-eligible Gowanus Canal Historic District are located within 90 feet of the Owls Head Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken between DEP and SHPO to determine what protection measures may be needed for these properties during construction of the Project.

The Project, a proposed below-grade CSO Facility and above-grade building would not have any indirect, contextual impacts on architectural resources in the study area as it would result in a low-rise industrial facility similar to other properties in the 2014 S/NR-eligible Gowanus Canal Historic District.

Force Mains and Sewers

Potential in-street sewer line improvements would be constructed in the vicinity of the Head End and Owls Head Sites. These improvements would be constructed within the boundaries of the 2014 S/NR-eligible Gowanus Canal Historic District, and also within 90 feet of properties that have been identified as individually S/NR-eligible, including the Pumping Station, the ASPCA Memorial Building, the former

R.G. Dunn and Company Building, and the Kentile Building Complex. Consultation is being undertaken between DEP and SHPO to determine what additional protection measures may be required for these properties, if any, to supplement standard DEP procedures for undertaking such construction. In addition, if there are any Belgian block pavers on the surface of city streets that would be affected during Project construction, DEP, to the extent practicable and feasible, would salvage and reinstall usable pavers, or replace any unusable ones in kind.

URBAN DESIGN AND VISUAL RESOURCES

The Project Sites are located within a manufacturing zoning district (M2-1). The two facilities would meet all applicable zoning requirements and would not require any modifications to the zoning regulations related to yards, height and setbacks, or bulk. Further, the CSO facilities are Use Group 18 manufacturing uses[10] and would not exceed the maximum bulk permitted for manufacturing uses in the M2-1 district. Similarly, the buildings which would house certain operations of the CSO facilities would be approximately 50 feet tall—below the permitted maximum streetwall height of 60 feet in an M2-1 district. Therefore, the buildings would comply with height and setback regulations permitted in this zoning district and would also be consistent with the urban design of the study area. While the Project would result in physical changes to the Head End Site and the Owls Head Site and would introduce new buildings, these changes would not be beyond what is currently allowed by existing zoning.

Given that the CSO facilities would be a complying manufacturing use under Use Group 18, Waterfront Zoning regulations related to public open space and visual corridors are not applicable to the Project. However, the facilities are being designed to enhance the character of the Project Sites and surrounding area, and to provide views to and through the Project Sites to the extent practicable.

In addition, it is anticipated that the Head End Site would include publicly accessible areas at street level, possibly with landscaping elements atop the below-grade tank area. It is also anticipated that the Head End Site would include a 50-foot setback from the bulkhead wall and would provide some form of waterfront public access along the Canal. Should these publicly accessible Project elements be developed at the Head End Site, they would further enhance the pedestrian experience of the urban design character of areas near the Head End Site.

Visual resources in the study areas for the Head End Site and the Owls Head Site are generally limited to the Canal itself, the architecturally significant Pumping Station and ASPCA Memorial Building, and the east portion of Thomas Greene Playground. Views of the Canal are limited from the east side of the Canal (in the areas near the project sites) due to the intervening buildings and structures on the Head End Site and the Owls Head Site. The proposed publicly accessible areas on the Head End Site would create new views of the Canal from nearby areas by removing existing structures and facilities, thereby improving westward views from the adjacent Thomas Greene Playground. Similarly, additional eastward views towards Thomas Greene Playground from Douglas Street and Degraw Street would also be possible. These changes would enhance the pedestrian experience as compared with the manufacturing and automotive-related facilities on these parcels that would remain in the future without the Project, and which limit visual and physical access to the Canal. Therefore, the changes at the Head End Site would be expected to enhance views from vantage points near the Head End Site. The Head End Facility would

[10] Under the Zoning Resolution (ZR), Use Group 18 consists of industrial uses such as storage or miscellaneous uses, open or enclosed; coal or gas storage; dumps, marine transfer stations for garbage or slag piles; and sewage disposal plants. The uses listed in Use Group 18 are permitted in a M2-1 district if such uses comply with all of the applicable performance standards for the district (ZR 42-00). As the CSO facilities would meet or exceed the applicable performance standards for the M2-1 zoning district, it is a permitted use under zoning.

also not affect views of the other visual resources in the area (the Pumping Station, ASPCA Memorial Building and the eastern end of the Thomas Greene Playground), which are located away from the Head End Site and would remain visible from the surrounding streets.

The Owls Head Facility would change the urban design character of the site with a new two-story above-grade structure and infrastructure modifications, paving, and landscaping. These changes to the Owls Head Site would be consistent with M2-1 zoning regulations. At the Owls Head Site, the DSNY salt storage facility at the site would be accommodated along with the Owls Head Facility and would be accessible to the public following completion of construction; the site could also be accessible for GCC activities following completion of construction. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility. Further, the anticipated landscaping elements would be an aesthetic improvement over existing conditions. Therefore, the Owls Head Site would enhance the urban design character of the project site and would improve views near the project site toward the Gowanus Canal with the anticipated landscaping elements.

Overall, the Project would comply with applicable zoning regulations regarding bulk and built form, and would result in physical and visual changes consistent with zoning regulations along the Canal. The pedestrian experience in certain areas along the Canal close to the Head End Facility and the Owls Head Facility would be enhanced with the new project components, including publicly accessible elements at the Head End Site and landscaping elements at the Owls Head Site. Therefore, the Project is not anticipated to result in any significant adverse impacts to urban design and visual resources or the pedestrian's experience of these characteristics of the built and natural environment.

NATURAL RESOURCES

GROUNDWATER

Project-related activities would include subsurface disturbance at the Head End Site and the Owls Head Site that are expected to encounter groundwater and require dewatering. To avoid exposing construction workers and the general public to existing groundwater contaminants, demolition, disposal, excavation, dewatering, and other construction activities associated with the Head End Facility, Owls Head Facility, and force main would be performed in accordance with all applicable federal, state, and local regulations and guidelines. Construction and operation of the Project would not result in the introduction of any new groundwater contaminants. Therefore, the Project would not result in significant adverse impacts with respect to groundwater.

FLOODPLAINS

Although the Head End Facility, Owl's Head Facility, and force main would all be constructed within the 100-year floodplain, construction and operation of the Project would not result in any significant adverse impacts to flood levels, flood risk, or the flow of flood waters and would not impact the designated flood hazard area. The floodplain within and adjacent to the Project Sites is affected by coastal flooding and would not be affected by construction or regrading/filling of the floodplain as would occur within a riverine floodplain. Coastal floodplains are influenced by astronomic tide and meteorological forces (e.g., nor'easters and hurricanes) rather than local flooding caused by precipitation. Therefore, the occupancy of the floodplain by the Project would not affect the flood elevation or increased risks due to flooding in the vicinity of the Project sites. Therefore, the Project would not result in significant adverse impacts with respect to flood hazard areas.

WETLANDS

Construction

The Gowanus Canal is a USFWS National Wetland Inventory (NWI)-mapped estuarine sub-tidal wetland and a NYSDEC-mapped littoral zone tidal wetland that are subject to regulation as a Water of the United States. Modifications to outfall RH-034 at the Head End Site would result in the temporary disturbance of 550 square feet of NYSDEC littoral zone tidal wetland, but no permanent impacts to NYSDEC littoral zone tidal wetland**.**

Construction of outfall OH-007 at the Owl's Head Site would have the potential to result in the temporary disturbance of approximately 500 square feet of NYSDEC littoral zone tidal wetlands in the immediate vicinity of the outfall location due to installation of a turbidity curtain and temporary cofferdam, and approximately 650 square feet (0.01 acres) of permanent impacts to NYSDEC littoral zone tidal wetland within the footprint of the replacement bulkhead extending approximately two feet waterward into the Canal. This minimal loss would not result in significant adverse impacts to NYSDEC littoral zone wetlands. Portions of the Owls Head Facility would be constructed within the NYSDEC-regulated tidal wetland adjacent area. Construction of the Owls Head Facility would be required to adhere to Development Restrictions outlined by the Tidal Wetland Act, including a 30-foot setback of all permanent structures from the NYSDEC-mapped tidal wetland boundary and restricting impervious surface within the Project Site to a maximum of 20 percent, including existing and new structures. Should the design of the Owls Head Facility not meet the Development Restrictions, DEP would be required to request a variance under 6 NYCRR PART 661.11 (or its equivalent under CERCLA). Finally, construction of the force main would only occur in upland areas. DEP will explore options for avoiding impacts to wetlands. However, if impacts to wetlands are unavoidable, DEP will explore mitigation options with USACE, NYSDEC, and USEPA, particularly for the small areas of vegetated marsh near the Owls Head Facility.

Sediment and Erosion Control protective measures, such as turbidity curtains, silt fences, and inlet (catch Basin) protection, would be utilized in accordance with the Stormwater Pollution Prevention Plan (SWPPP) to prevent and minimize indirect impacts to wetlands within the study area. All construction activities that would take place within waters of the United States and NYSDEC littoral zone tidal wetlands would be completed in compliance with any conditions required by the USACE under Section 404 of the Clean Water Act and NYSDEC under Articles 15 and 25 of the NY ECL, or through equivalent approvals.

Operation

The Project would increase CSO capture for overflows that would otherwise be discharged from CSO outfalls RH-034 and OH-007 to the Canal. Therefore operation of the Project would not result in any significant adverse impacts to wetlands.

AQUATIC RESOURCES

Components of the Project that have the potential to impact aquatic resources include the possible installation and removal of cofferdams during outfall construction, demolition and removal of the existing OH-007 outfall, replacement of the bulkhead at the Owl's Head Site, modifications to the RH-038 outfall, and elimination and diversion of CSO discharge from existing outfalls.

Water Quality

Construction

Construction of the Project would have the potential to result in temporary effects to water quality resulting from sediment re-suspension during the possible placement and removal of a cofferdam at outfall OH-007 and potentially at outfall RH-038. In general, installation of cofferdams constructed with sheet piles does not result in significant levels of sediment disturbance. The greatest potential for increased turbidity typically occurs when the cofferdam is removed. Sediment disturbance associated with installation and removal of the cofferdam is anticipated to result in minor, short-term increases in re-suspended sediment and re-deposition of contaminants, which would be contained within a turbidity curtain put in place before the sheet pile is driven and before the cofferdam is removed.

The demolition and reconstruction of outfall OH-007 would be completed within the cofferdam, which would be driven outboard of the toe of the existing shoreline stabilization, minimizing potential increases in suspended sediment and adverse impacts to water quality due to the Project. Installation of the new bulkhead at the Owls Head Facility would also have the potential to result in sediment resuspension. Increases in suspended sediment associated with installation and removal of the cofferdam and the installation of a new bulkhead at the Owls Head Facility would be temporary and would be contained within a turbidity curtain. Operation of the Flushing Tunnel has improved water circulation in the Canal, and any re-suspended sediment from installation or removal of the turbidity curtains would be expected to dissipate relatively quickly with the flow of water and are not anticipated to result in significant adverse impacts to water quality. Demolition and reconstruction of outfall OH-007 would be conducted within cofferdams and would not result in additional sediment re-suspension or subsequent adverse impacts to water quality. Therefore, any sediment disturbance during construction would not result in significant adverse impacts to water quality. Finally, no in-water construction activities would be required for installation of the force main.

Upland demolition and construction activities, including force main construction and shoreline stabilization (i.e., bulkhead replacement), would be undertaken in accordance with erosion and sediment control plans and best management practices incorporated into the SWPPP prepared for the Project, as required under the SPDES General Permit for Construction Activities, and would not result in adverse impacts to water quality from stormwater discharge during construction. This would include all staging areas, and any areas used for the temporary storage of excavated material. All groundwater recovered during dewatering would be treated and discharged to the Canal, as needed for the force main construction, in accordance with applicable regulatory requirements and as discussed in "Hazardous Materials."

Operation

Once operational, the Owls Head Facility and Head End Facility would provide ongoing benefits to water quality in the Canal. The number of CSO events will be reduced, benefitting water quality. Specifically, the CSO volume discharged from outfall RH-034 at the Head End Site would be reduced by approximately 76 percent, and the CSO volume discharged from outfall OH-007 at the Owls Head Site would be reduced by approximately 85 percent.

Sediment Quality

Construction

Installation and removal of cofferdams would result in temporary increases in suspended sediment containing varying levels of contamination. Any sediments and associated contaminants re-suspended during installation and removal of the cofferdams are expected to be contained within the turbidity curtains. Any re-suspended sediment resulting from installation removal of the turbidity curtains would be localized and would dissipate relatively quickly with the improved water flow provided by the Flushing Tunnel. Re-suspended sediment would settle out over sediment with similar levels of contamination, and thus would not result in adverse impacts to sediment quality. Demolition and reconstruction of outfall OH-007 would be conducted within a cofferdam, and installation of the bulkhead at the Owls Head Facility within a turbidity curtain, and would not result in increased turbidity or contaminant re-suspension in the Canal.

Erosion and sediment control measures implemented in accordance with the SWPPP prepared for the Project would minimize the discharge of sediment to the Canal during demolition and construction activities, including shoreline stabilization, and are not anticipated to result in significant adverse impacts to sediments in the Canal. All contaminated material, including sediments excavated and removed during construction activities, would be disposed of in accordance with applicable regulatory requirements.

Operation

The Project would result in an estimated 76 percent solids load reduction by volume basis for the Head End Facility and an estimated 85 percent solids load reduction by volume basis for the Owls Head Facility. Rather than entering the Canal through these outfalls, CSO solids would instead be subject to settling processes (i.e., passage through screens, removal by degritting pumps) prior to conveyance to the Red Hook and Owls Head WWTPs.

Aquatic Biota

Construction

The in-water construction activities described above would have the potential to result in temporary adverse effects on fishes and benthic macroinvertebrates in a localized area surrounding the construction due to temporary increases in suspended sediment and underwater noise during cofferdam installation and removal. These potential effects, described below, would be temporary, only lasting as long as the duration for in-water construction activities (approximately 6 to 9 months) and would not result in significant adverse impacts to the aquatic community.

Suspended Sediment

Life stages of estuarine and anadromous fish and macroinvertebrate species are generally tolerant of elevated suspended sediment concentrations and have evolved behavioral and physiological mechanisms for dealing with variable and potentially high concentrations of suspended sediment. Aquatic biota found in the Gowanus Canal also tend to be pollution-tolerant. Any sediment re-suspension that would occur during in-water work would be temporary, minimal, and localized, and would be well within suspended sediment tolerance thresholds of larval fish and benthic macroinvertebrates found in estuarine environments. Additionally, because fish are mobile and generally avoid unsuitable conditions such as high suspended sediment concentrations, the effects of habitat avoidance would not significantly affect their condition, fitness, or survival. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity.

Sheet pile cofferdams and turbidity curtains would be installed prior to the commencement of in-water construction activities associated with demolition and construction of outfall OH-007, and turbidity curtains would be installed prior to installing the bulkhead at the Owls Head Facility, and would be removed when the work is completed (likely after 6 to 9 months). There would be minimal sediment re-suspension associated with the installation and removal of each cofferdam. As discussed above, any temporary increase in suspended sediment associated with in-water construction activities would be localized and would dissipate following cessation of the sediment disturbing activity. Installation and removal of the cofferdams would be an intermittent disturbance, and would therefore have a limited effect on suspended sediment concentrations within any given location during the course of construction. The flow of water through the Canal, as influenced by the Flushing Tunnel and tidal processes, would help to dissipate any re-suspended sediments such that re-deposition in the Canal would not adversely affect benthic macroinvertebrates or bottom-dwelling finfish. Demolition and reconstruction of outfall OH-007 would be contained within the cofferdams, and the installation of the bulkhead within turbidity curtains, and would not result in additional sediment re-suspension that could affect aquatic biota.

Underwater Noise

Most construction activities would be conducted on land and delivery, and removal of materials are assumed to occur by truck and not by water. Therefore, there would be no increase in vessel activity and associated underwater noise as a result of the Project. Installation and removal of steel sheetpile cofferdam walls, and sheet pile bulkhead at the Owls Head Facility with a vibratory hammer would result in a temporary increase in underwater noise during installation of each sheet pile section. Elevated underwater noise would be temporary, as the cofferdams and bulkhead would be installed over a period of 6 to 9 months. Installation of the sheetpile for the cofferdam structures would result in temporary increased underwater noise levels that would not be expected to exceed the threshold for physiological injury to fishes.[11] Fish would likely avoid portions of the Canal in the vicinity of sheetpile installation above the behavioral threshold (150 dB SPLrms) that would occur within 150 to 300 feet of the pile-driving activity. The Canal is narrow at both the Head End and Owls Head Sites, and its full width would likely have elevated underwater noise levels (i.e., ensonified, >150 dB SPLrms) during vibratory driving of the sheetpile cofferdam sections. Most of the Canal between the two outfall locations and downstream of outfall OH-007 would be non-ensonified (< 150 dB SPLrms) at any given time during sheetpile installation. Since most finfish that occur in the Canal are migratory rather than resident species, and generally occur in higher numbers near the confluence of the Canal with Gowanus Bay downstream of both Project sites, fish would likely be able to avoid the ensonified portions of the Canal during pile driving. The temporary loss of potential foraging habitat within and in the vicinity of the ensonified area near the cofferdams, when compared with similar habitat that would be available in the vicinity, would not result in a significant adverse impact to aquatic biota. For these reasons, the temporary increase in underwater noise during construction of the Project would not have significant adverse effects on aquatic biota.

Loss of Water Column Habitat

In-water construction activities at outfall RH-038 would result in a temporary loss of approximately 550 square feet of habitat and associated water column within the cofferdam and turbidity curtain. Construction on this outfall is currently planned to occur on land. The use of a cofferdam and turbidity curtain at outfall OH-007 would result in the temporary loss of 500 square feet of habitat and associated water column. The exclusion of aquatic organisms from the area within the cofferdams would constitute a temporary loss of a minimal area of potential foraging habitat. Because similar habitat would still be available nearby, this temporary loss of a minimal area of habitat would not result in a significant adverse impact to aquatic biota. Fish and benthic organisms would be expected to return to the construction areas when the in-water work is complete and the cofferdams are removed.

Operation

As discussed above, the reduction and treatment of CSO discharged to the Canal will contribute to improvements in water and sediment quality, and therefore, will help to improve aquatic habitat for the

[11] For vibratory driving of steel sheetpile, typical noise levels at a distance of 33 feet from the pile have been reported as 175 dB SPLpeak, 160 dB SPLrms, and 160 dB for the 1-second SEL. These sound levels are continuous rather than percussive and would not exceed the threshold of 206 dB SPLpeak that is associated with the onset of recoverable physiological injury to fishes.

migratory species that occur in the area. The waterward installation of the shoreline stabilization will result in the loss of approximately 650 square feet of bottom and associated water column habitat along approximately 320 linear feet of shoreline at the Owls Head site (mudline to mean high water [MHW]). This minimal loss of habitat similar to that found throughout the Canal would not be expected to result in significant adverse impacts to aquatic biota.

Essential Fish Habitat

Construction and operation of the Project would not result in any significant adverse impacts to water quality, aquatic habitat, or aquatic biota of the Canal. Therefore, the Project would not result in significant adverse impacts to the suitability of the Project site for fish species identified by NMFS as having EFH in the Canal.

TERRESTRIAL RESOURCES

Ecological Communities

Construction

Ecological communities within the study area are limited to Terrestrial Cultural and Open Uplands communities that are regionally common and sparsely vegetated. Construction of the Head End Facility and Owls Head Facility would result in the loss of these ecological communities commonly found within New York City and would not result in significant adverse impacts to these resources. Construction of the Project would result in the removal of up to four street trees at the Head End Site and no trees at the Owls Head Site. However, all work would be performed in compliance with Local Law 3 of 2010 and the NYC Parks Tree Protection Protocol. DEP would coordinate with the Gowanus Canal Conservancy with respect to the native plant nursery in advance of construction activities. Therefore, construction of the Project would not result in significant adverse impact to ecological communities.

Operation

The Head End Facility would include the development of some type of publicly accessible vegetated open space or waterfront access as part of the Project, thus resulting in more vegetated habitat within the study area Any required replacement and/or restitution would be provided in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York. As part of the design process DEP would evaluate the feasibility of the Gowanus Canal Conservancy’s post-construction use of the Owls Head Site for their native plant nursery and other community programs. If feasible, this post-construction use would be incorporated into the design of the Owls Head Facility. Therefore, operation of the Project would not result in significant adverse impacts to ecological communities.

WILDLIFE

Construction

The study area is limited to previously disturbed City streets and building exteriors that provide habitat to only the most disturbance-tolerant wildlife species. Construction of the Project would likely result in the temporary displacement of wildlife; however, similar habitat is available in the vicinity of the study area and the temporary disturbance of individuals of urban tolerant species would not result in significant adverse impacts to wildlife resources. Therefore, construction of the Project would not result in significant adverse impacts to wildlife.

Operation

The surface areas on the sites are expected to be paved and accessible for maintenance and operations, with landscaping where appropriate. This landscaping would provide forage for pollinators, and higher quality habitat for other species. Therefore, operation of the Project would not result in significant adverse impacts to wildlife.

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES

Construction

Federally listed species that were identified as potentially within the study area are not expected to be present due to the lack of suitable habitat. Therefore, construction of the Project would not result in significant adverse impacts to threatened, endangered, and special concern species.

Operation

Maintenance and operation of landscaping would not change the lack of suitable habitat for federally listed species, thus federally listed species are not expected to be present within the study area. Therefore, operation of the Project would not result in significant adverse impacts to threatened, endangered, and special concern species.

HAZARDOUS MATERIALS

Both the Head End Site and Owls Head Site have a long history of commercial/industrial uses, with which subsurface contamination (in the fill, soil, and/or groundwater) is frequently associated. The Head End Site has been extensively investigated and has documented subsurface contamination due to portions of an MGP that were historically located on this site. The Owls Head Site, though it did not historically include MGP facilities, has documented subsurface MGP contamination. Additionally, any required demolition of or disturbance to the existing buildings at the Project Sites w~~c~~ould entail addressing any asbestos containing materials (ACM), lead-based paint (LBP), or other hazardous materials that might be present.

Independent of the Project, portions of the required remediation for the Head End Site would be conducted by National Grid pursuant to administrative orders under the jurisdiction of NYSDEC and in coordination with the remediation required under CERCLA by USEPA. NYSDEC's ROD issued in 2015 requires National Grid to construct a bulkhead along the east bank of the Canal, install coal tar extraction wells, and excavate or stabilize the MGP-related contamination. This remediation and construction work being conducted by National Grid would be coordinated with the construction of the Project and is expected to occur when the Head End Site properties are accessible, i.e., after demolition by DEP but before the excavation and construction of the CSO Facility at the Head End Site. The Settlement Agreement states National Grid would perform any remediation that is required outside of the footprint of the CSO tank prior to the tank construction. Any excavation or remediation required within the footprint of the tank would take place as part of the tank construction. NYSDEC indicated that further remediation and monitoring may also be required. The RH-034 Staging Area property would be remediated by others following construction of the CSO Tank Facility and prior to re-development of that site.

In addition, the bulkhead at the Owls Head Site would likely be stabilized or replaced prior to any in-water remediation activities conducted by National Grid in the Canal. Investigations would be performed to characterize the geotechnical and environmental conditions prior to design of a new bulkhead.

CONSTRUCTION

Construction of the Project would be divided into three construction phases (CP-1, CP-2, and CP-3). CP-1 includes site preparation, utility relocation, and demolition. CP-2 includes the support of excavation (SOE) construction, site excavation, and construction of the below-grade structures. CP-3 includes the construction of the above-grade structures, conveyances, and outfalls. The construction staging area for the Head End Site would be cleared with only the concrete foundation slab remaining to support Project construction.

Demolition

Demolition of existing above-grade structures would be required. This work, at a minimum, would conform to the following regulatory requirements (additional requirements may be incorporated into the project specifications):

- Prior to any demolition activities with the potential to disturb (aboveground or underground) petroleum storage tanks, these tanks would be closed and removed, along with any contaminated soil, in accordance with applicable requirements and guidelines including NYSDEC spill reporting and tank registration requirements. If tanks are unexpectedly discovered, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage registrations would be kept updated with the status of the tanks.
- Unless information exists to indicate that suspect ACM do not contain asbestos, prior to any demolition activities an asbestos survey would be completed by a qualified individual/contractor, and all ACM that would be disturbed by the demolition activities would be removed and disposed of in accordance with local, state, and federal regulations and guidelines.
- Any demolition activities with the potential to disturb positively identified or suspected LBP/LCP would be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62—Lead Exposure in Construction).
- Unless labeling or laboratory testing data indicates that suspected polychlorinated biphenyl (PCB)-containing fluorescent lighting fixtures, transformers, other electrical equipment, lifts, and elevators do not contain PCBs, and that fluorescent lights do not contain mercury, disposal would be performed in accordance with applicable federal, state, and local regulations and guidelines.
- Disposal of any hazardous materials or hazardous wastes would be in accordance with applicable regulations and guidelines.

Subsurface Disturbance

At the Head End Site, after demolition under the CP-1 construction phase and prior to the CP-2 site excavation and construction of the below-grade structures, National Grid (as required by NYSDEC and USEPA) would undertake its site remediation activities at the Head End Site, which would include constructing a bulkhead, installing coal tar extraction wells, and excavating or stabilizing MGP-related contamination outside the footprint of the CSO Facility. The remediation and construction work being conducted by National Grid would be coordinated with the construction of the Project. NYSDEC indicated that further remediation and monitoring may also be required.

Construction of the Project under the CP-2 construction phase would require extensive excavation for tanks and conveyance piping at both Project Sites.

The Head End Facility would include an 8-MG underground tank with a depth ranging from approximately 27 to 36 feet below grade (with some excavation in certain areas as deep as 60 feet). Excavation of approximately 122,000 to 172,000 cubic yards (CY) of soil is anticipated to be required for the tank and SOE. Although National Grid will complete their remediation work at the Head End Site to address MGP-related contamination prior to commencement of construction for the CSO Facilities Project, for the SOE and excavation for the below-grade tank, it is anticipated that construction of the CSO Facility, on the portion of the Head End Site not used for construction staging, would require removal of additional soil (including soil containing coal tar and potentially petroleum) and treatment of groundwater (containing benzene and other contaminants) removed by dewatering. The RH-034 Staging Area Property would not require excavation as part of the Project and therefore, the Project would not result in additional in-ground disturbance in this area.

The Owls Head Facility would include a 4-MG underground tank with a depth ranging from approximately 30 and 39 feet below grade (with some excavation in certain areas as deep as 55 feet). Excavation of approximately 56,000 to 68,000 CY of soil is anticipated to be required for the tank and SOE.

Based on the existing studies discussed above at both Project Sites, shallow subsurface soil contamination is known to be present in certain areas (and possibly present in other locations not yet tested), but is less significant and less of a concern than the contamination below the water table, especially that related to former MGPs. However, the entire project area consists of fill material of unknown origin even in areas not contaminated by wastes from historical MGPs or petroleum spills. Although testing did not indicate widespread significant contamination of this fill, localized areas with elevated contamination were found and may be present in other locations not yet tested. Project-related excavation would disturb these soils and potentially increase pathways for human or environmental exposure.

As a part of preparing the facility design, DEP has conducted or is conducting additional investigation and treatability studies, for both the Head End and Owls Head Sites, to inform and guide the design by characterizing the environmental conditions at the sites and evaluating options for treatment and disposal of the soil and material to be excavated and the groundwater to be managed during construction. Any ~~coal tar~~ MGP-related or other contamination that is within the limits of excavation for the CSO facilities will be properly managed during construction. Any coal tar contamination remaining at the sites after construction of the CSO facilities would be addressed in coordination with the USEPA and NYSDEC. The CP-2 subsurface construction/remediation work conducted on the Head End Site for the construction of the CSO Facility would, per the Settlement Agreement between USEPA and the City, be conducted as a Removal Action. DEP would prepare a Plan for USEPA approval setting out the procedures to be followed during the CP-2 construction phase of the Project. The procedures that may be included in the Plan are summarized below.

Soil Removal

Portions of the soil to be excavated ~~soil~~ are ~~anticipated to be~~ impacted by MGP residuals. Soils containing MGP residuals or other contamination would be transported to a licensed and USEPA-approved off-site facility for treatment or disposal. Wet soils (from below the water table) would typically be treated to stabilize free liquid before being transported offsite for treatment or disposal. Soils containing high levels of MGP residuals would be treated in off-site thermal desorption units. In this process the soil is heated to volatilize the volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) into the gaseous phase, which then is further treated to destroy or otherwise remove the contaminants. The treated soil may be reused as landfill daily cover or fill material, if levels of non-volatile contaminants are below established limits, or disposed in a non-hazardous waste landfill. Soils with lower levels of MGP residuals and/or other hazardous materials, which do not exhibit any of the characteristics of hazardous waste, ~~would be~~may also be treated via off-site thermal desorption or disposed in a non-hazardous waste landfill. Although it is not expected (based on the available data) that the soil would ~~exhibit a characteristic of~~be classified as a hazardous waste, contingencies would be in place to manage such soils either by treating them to eliminate the characteristic (e.g., mixing the soil with cement or other material to stabilize the contaminants) or disposing of them at a licensed and USEPA-approved hazardous waste treatment/disposal facility. In all cases, there are strict regulatory requirements governing the transportation and treatment/disposal of these soils and facility-specific permits (issued by NYSDEC or the equivalent for treatment/disposal facilities in other states) that set out detailed acceptance criteria. Additionally, USEPA must approve of any offsite treatment and disposal facilities for the Project pursuant to CERCLA requirements. Additional testing would need to be performed, as part of a Waste Characterization Plan that would be developed as a part of the Final Design, to determine compliance with disposal facility criteria.

Properly managed, the deep excavations and dewatering required for construction of the tanks ultimately would have beneficial effects related to hazardous materials, as these activities would remove contamination from the sites to a greater extent than would likely occur with only National Grid's cleanup of the Head End Site; NYSDEC does not typically require such deep excavation for cleanup, even if deep contamination is present.

However, without proper controls, subsurface construction activities could result in unacceptable exposures to hazardous materials by construction workers, the general public and/or the environment. To avoid such exposures, the measures summarized below would be incorporated into the Project (final requirements would be specified by the designers and included in the bid documents) to reduce the potential for significant adverse impacts during Project construction and implementation.

- ~~Prior to construction, further investigation of both sites would be performed by DEP to better determine the nature of the soils that would be excavated during construction in order to prescribe appropriate procedures (and treatment or disposal facilities) for management and handling of these soils during construction, protect the health of the general public and project construction workers, and to reduce the potential for significant adverse impacts. As noted above, procedures for this work and for the treatment of any contaminated groundwater removed during dewatering would be subject to NYSDEC and/or USEPA approval.~~
- Investigations of both sites were performed by DEP to better determine the nature of the soils that would be excavated during construction, the water that may require dewatering, and the soil vapor present within the soil. Based on the results of the~~se additional~~ investigations ~~and the other investigations~~ that have ~~already~~ been completed and, if determined to be necessary, any additional investigations, appropriate measures will be developed for protection of workers, the general public and the environment and included in the Remedial Design Reports prepared for the Head End and the Owls Head Sites. Procedures for this work and for the treatment of any contaminated groundwater removed during dewatering would be subject to NYSDEC, DEP and/or USEPA approval.
- Due to known MGP contamination at the Head End Site and ~~possible MGP contamination at~~ the Owls Head Site, the procedures would generally be more stringent than would be typically required at construction sites with no MGP-related contamination. For both the Head End and the Owls Head Sites, the various construction documents would address management of soil and groundwater, including procedures for:
  - **Health and safety measures** to protect workers and the surrounding community. These measures would ensure that all soil disturbance is performed in a manner protective of project construction workers, the general public, and the environment, and would include procedures for odor, dust, and nuisance control, as well as air monitoring requirements.
  - **Soil screening** during excavation. Visual, olfactory, and instrument-based soil screening would be performed under the supervision of a Qualified Environmental Professional during construction that involves subsurface disturbance. Soils will be segregated (based on screening

results, existing environmental data, and additional data such as waste characterization data) into material intended for off-site treatment or disposal, material intended for re-use as backfill material (if needed), and material that requires further sampling and testing to determine its fate.

- **Construction-related dewatering**. Testing to date indicates that at both Project Sites water collected from dewatering activities would require treatment prior to discharge, particularly given the MGP contamination~~ at the Head End Site and the potential for MGP contamination at the Owls Head Site~~. At both Project Sites a temporary groundwater treatment system would be designed to treat water generated during construction from excavation dewatering; drainage of excavated materials; contact stormwater runoff; decontamination of construction vehicles, equipment and tools; and other minor sources. Based on available data, influent water could contain a wide range of constituents including: oil and grease, VOCs, SVOCs, pesticides and metals; and NAPL from the former MGP operations which could be encountered in the groundwater. Treatment processes would likely include some ~~of~~ or all of the following steps: (1) tanks for equalization, sedimentation and removal of free product: metals removal and air stripping using chemical addition for pH adjustment, coagulation and flocculation, and either a settler/clarifier, packaged bag filters, and tray stripper system or a venturi stripping system, sludge tank, and bag filters; (2) granular activated carbon for removal of organic compounds and metals; (3) contingent ion exchange for low level metals removal; (4) sludge dewatering (holding tank, polymer feed system and geotube or filter press); and (5) vapor-phase granular activated carbon or biofilter for air stripper off-gas. Solids generated from treatment would be disposed off-site or regenerated for reuse within the treatment system (e.g., activated carbon). It is anticipated that effluent from the temporary treatment system would be discharged directly to the Canal or the sanitary sewer system. Dewatering would be conducted in accordance with applicable permitting requirements. Treatment limits would be established by NYSDEC, DEP, and/or USEPA.
- **Odor and vapor / dust control / monitoring**. Excavation in MGP contamination areas could result in significant odor concerns (as well as health and safety issues). Odor control procedures might include: limiting the area of open excavations; shrouding excavations with physical barriers (textile covers) or structural enclosures; and/or use (with or without additives) of foams, sprays or misting systems. Dust control procedures would include: use of water spray (with or without additives) for roads, trucks, excavation areas and stockpiles; use of tarps to cover stockpiles; use of gravel or recycled concrete aggregate (or other suitable materials) to provide a clean and dust-free road surface; use of a truck wash at site access/egress points; and the potential implementation of a sprung structure or similar enclosure surrounding excavation or staging areas to control dust and vapors. In addition, during excavation and loading of any hazardous waste or MGP-contaminated or petroleum-contaminated soil, real-time vapor and fugitive dust particulate (PM_{10}) monitoring would be performed through a Community Air Monitoring Program (CAMP). The CAMP could include fixed air monitoring and meteorological stations, and action levels and corrective measures to be taken when values indicate responses are necessary. Throughout demolition and construction, erosion and sediment controls would be implemented to comply with the NYSDEC State Pollution Discharge Elimination System (SPDES) general permit for Construction Activity. An SWPPP and appropriate best management practices (BMPs) for construction activities involving soil disturbances would be implemented. Additional dust control measures may include: use of stone and gravel pads at entryways; use of mulch and hydro seeding in areas that will remain open or for long-term soil stockpiles; barriers (wind fences) to reduce wind impacts; and administrative controls such as establishing traffic patterns and speeds, establishing unsafe wind speeds and atmospheric conditions, managing and optimizing earth moving steps, and establishing stockpile configuration.

- **Contingency Plan**. Given the unknown origin of the project site's fill material and other uncertainties, the discovery of unknown structures or contaminated media during excavation is possible. Any such findings would be reported to the appropriate regulatory and/or emergency management agencies. Petroleum spills will immediately be reported to the NYSDEC Spill Hotline. Petroleum tanks will be addressed in accordance with applicable Petroleum Bulk Storage (PBS) requirements and guidelines, including those relating to spill reporting and tank registration.
- **Underground tanks** or other sources of contamination encountered during construction activities. Petroleum spills would be reported to the NYSDEC Spill Hotline. Petroleum tanks would be addressed in accordance with applicable NYSDEC requirements, including those relating to spill reporting and tank registration;
- **Import of backfill** or clean cover soil from off-site sources. Material from industrial sites, spill sites, environmental remediation sites, or other potentially contaminated sites would not be used. Testing for import of clean cover soil or fill would be performed in accordance with DER-10 Table 5.4(e) 10 guidance and 6 NYCRR Part 375 Soil Cleanup Objectives (unless regulatory approval has been obtained for alternative requirements).
- **Reuse of on-site materials**. Soil meeting the definition of hazardous waste or containing petroleum, MGP-related contamination, or other types of gross contamination would not be reused, and would be disposed of at an approved off-site treatment or disposal facility. Although not anticipated, other soil could potentially be reused in accordance with NYSDEC's requirements for beneficial reuse (6 NYCRR 360-1.15(b)(8)) related to *"nonhazardous, contaminated soil which has been excavated as part of a construction project… and which is used as backfill for the same excavation or excavations containing similar contaminants at the same site."* Additionally, soil treated by thermal desorption can be reused, if residual contaminant levels meet the applicable NYSDEC requirements.
- **Off-Site Transportation and Disposal**. Outbound trucks will be inspected and cleaned if necessary before leaving, and all access/egress points for trucks and equipment will be kept clean of site-derived materials. Locations where vehicles exit the site will be inspected daily for evidence of soil tracking off premises. Truck wash facilities will be used as necessary to limit soil tracking onto adjacent streets. Cleaning of the adjacent streets will be performed as needed. Open uncontrolled mechanical processing of historical fill or contaminated soil on-site would not be performed. Loaded vehicles leaving the site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws, regulations, and guidelines. Routes on- and off-site will be routinely monitored for build-up of excessive soils and dust and cleaned as necessary. Material transport to the site will be organized and scheduled to minimize truck queuing. A manifest-based tracking system will be used to document the proper management of material to its final destination. Trucks will be expected to use New York City Department of Transportation (NYCDOT)-designated truck routes. All material will be disposed of in accordance with applicable laws, regulations and guidelines. A documentation/manifest process will be used to document conformance with applicable laws, regulations and guidelines.
- **Demarcation**. Following any soil contaminant "hot spot" removal, prior to backfilling, the top of the residual soil/fill will be established by placement of a demarcation layer (e.g., a geotextile liner); or by land survey; or material beneath the backfill will be considered contaminated and subject to management as such after the project is complete.
- **Stockpile Methods**. Stockpiles of excavated material will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, as

well as before and after every storm event, in order to ensure they are not subject to excessive erosion. Stockpiles of soil exhibiting evidence of contamination will be placed on a layer of impervious material and kept covered with appropriately anchored plastic tarps when not being loaded/unloaded. Stockpiles will be encircled with rigid barriers and/or silt fencing. Stockpiles will be managed appropriately with respect to anticipated end-use. Excavated materials from suspected areas of contamination will be separated from materials intended for re-use. Imported materials will be stockpiled separately. All designated stockpile areas shall be kept free of standing water at all times. Stockpiles will be managed to control stormwater run-off in accordance with applicable laws, regulations, and guidelines. Stockpiles will be located away from the Canal and property boundaries, where possible.

- **Preparation of close-out documentation**. Following completion of all soil disturbance associated with Project construction, appropriate closure reports (i.e., Remedial Action Reports) would be prepared documenting regulatory compliance with the approved design, plans, and permits. For the Head End Site, a Site Management Plan (SMP) is required pursuant to the July 2015 NYSDEC ROD to address long-term requirements for managing residual contaminated subsurface material. It is anticipated that an SMP also would be prepared for the Owls Head Site pending the results of ongoing investigations.

OPERATION

Following construction, residual contamination would remain at the Head End Site and possibly at the Owls Head Site. However, construction would have capped the disturbed areas with the tanks, other facilities or other impermeable surfaces, with demarcation where required to indicate the presence of residual soil/fill with known/potential contamination. As such, this would prevent exposure by workers and the community to subsurface contaminants remaining beneath the project construction areas. Any residual contamination would remain subject to NYSDEC (and potentially USEPA) controls, through an SMP. This will ensure that any subsequent subsurface disturbance at the Project Site, e.g., for repairs or construction of new or upgraded facilities, would be conducted in a safe manner that is protective of the general public, workers, and the environment. The required procedures, and the areas/depths at which additional safety measures would be required, would be set out in the SMPs.

Once operational, the CSO Facilities will provide ongoing benefits by reducing the volume of CSO discharged to the Canal.

With implementation of the all appropriate and required site remediation measures described above, the Project would not result in any significant adverse effects related to hazardous materials during either construction or operation.

WATER AND SEWER INFRASTRUCTURE

The Project will meet the goals of the USEPA ROD, i.e., a 58 to 74 percent reduction in CSO solids discharging to the Canal from the RH-034 and OH-007 outfalls. Pump-back events from the CSO facilities to the WWTPs following wet-weather events are expected to occur approximately 40 to 50 times per year, and would take place during dry-weather flow conditions. The maximum pump-back volume from the Head End Facility would be 8 MG to the RH WWTP over a 24-hour period (a maximum pump-back rate of 0.33 MG per hour), and the corresponding maximum pump-back volume from the Owls Head Facility would be 4 MG to the OH WWTP (a maximum pump-back rate of 0.17 MG per hour). These flows—which account for approximately 13 percent and 3.3 percent of the permitted dry weather treatment capacities of the RH and OH WWTPs, respectively—and their associated TSS loads can be readily accommodated by the plants, based on their available capacities. Therefore, CSO pump-back from the Head End and Owls Head Facilities would not adversely affect wastewater treatment performance at the OH and RH WWTPs.

In addition, a hydraulic analysis was utilized in the design of all elements of the Project, including conveyance piping, storage tanks, and screening systems, based on a modeled 5-year, 2-hour storm, and accounting for tide levels in the Canal. Based on the parameters established by the hydraulic analysis, the facilities and related improvements (e.g., pumping station and regulator upgrades) have been designed with a hydraulic profile that ensures all flow is conveyed through the system by gravity and any unusually large flows that cannot be stored and processed by the CSO facilities are discharged to the Canal before causing upstream flooding or basement backups. Therefore, the Project would not adversely affect wastewater treatment performance at the Red Hook and Owls Head WWTPs or sanitary and stormwater drainage and management.

SOLID WASTE AND SANITATION SERVICES

The CSO facilities at the Head End and Owls Head Sites would be largely automated and would not require permanent staffing. During operation of the CSO facilities, which during a typical year is expected to occur approximately 40 to 50 times, up to two personnel would be on site at each CSO Facility to monitor and manage equipment operations. Assuming a rate of 13 pounds per week per employee[12] and assuming a maximum of four employees, the CSO facilities would generate an estimated 52 pounds of solid waste per week. The CSO facilities would also be equipped with screening systems to remove large debris from influent flow to the tanks as well as grit removal systems to remove materials such as silt, sand, and gravels from the stored flow prior to discharging to the sewer system. Residual solids from both the screening systems and the grit removal systems would be collected and stored in a 26- to 30-cubic-yard dumpster (with holding capacity for approximately 35 to 40 tons) located on-site at each Facility. After each CSO event—a wet weather event during which combined sewer flow (i.e., stormwater and sanitary sewage) would be conveyed to the facilities and detained—each dumpster would be picked up and replaced by a waste hauling company under contract with the City of New York.

Operation of the Project would result in a level of solid waste generation that would be easily accommodated by existing waste transfer operators serving the Project sites and the surrounding neighborhood. Therefore, the Project would not result in any adverse impacts on solid waste and sanitation services, and no further analysis is necessary.

ENERGY

The CSO facilities are expected to be in operation approximately 40 to 50 times during a typical year, and are estimated to require a total of approximately 10.5 million British Thermal Units (BTUs) in energy consumption per year (approximately 7 million BTUs at the Head End Facility and approximately 3.5 million BTUs at the Owls Head Facility), a net decrease in energy consumption as compared with the existing facilities that would be displaced as a result of the Project. Compared with the approximately 368 ~~376~~ trillion BTUs of energy provided by Con Edison within the New York City and Westchester County service area, the Project's energy consumption would be considered negligible. The load and service connections necessary to accommodate the CSO facilities will be confirmed in consultation with Con Edison during detailed design**.** Therefore, the Project is not expected to result in any significant adverse impacts to energy generation or transmission, and no further analysis is warranted.

[12] Estimate utilizes the solid waste generation rate for office workers; see the *CEQR Technical Manual*, Table 14-1.

TRANSPORTATION

During typical operating conditions, the CSO facilities at the Head End and Owl's Head Sites would either be fully automatic or remotely controlled from the Red Hook and Owl's Head WWTPs, and would not require permanent staffing. Under wet weather events typically occurring 40 to 50 times per year, up to two personnel would travel to each Facility to monitor and manage equipment operations. During and after such events, a waste hauling company would pick up the grit removed from the tanks, which would constitute minimal and intermittent truck trips.

Additionally, it is anticipated that some type of publicly accessible open space or waterfront access would be developed at the Head End Site as part of the Project. For purposes of analysis, it is assumed this space would be a maximum of approximately 2.4 acres (the total area of the Head End Site, excepting the construction staging area). Per the *CEQR Technical Manual*, this potential open space would generate a maximum of 20 person trips and two vehicle trips during any one hour during the weekday and 28 person trips and four vehicle trips during any one hour during peak Saturday periods.

As a result, the operation of the Project would generate nominal amounts of operational peak hour traffic, transit, and pedestrian trips, and would be well below the *CEQR Technical Manual* Level 1 screening thresholds. Therefore, the Project is not anticipated to result in any significant adverse transportation impacts.

AIR QUALITY

The Head End Facility and the Owls Head Facility would include a natural gas-burning heating, ventilation, and air conditioning (HVAC) system, ~~an emergency generator,~~ and an odor control system.

Emissions from both the Head End and the Owls Head Facilities were modeled together to obtain total combined maximum concentrations from the Project. Maximum combined concentrations occur 60 feet from the Head End Facility and are below the National Ambient Air Quality Standards (NAAQS), particulate matter, or $PM_{2.5}$ *de minimis* thresholds, and the 1 parts per billion (ppb) and 10 ppb odor criteria. Therefore, emissions from the combined operation of the Head End Facility and Owls Head Facility would not result in significant adverse air quality impacts.

The Project's HVAC systems ~~and emergency generators~~ would not result in an exceedance of the NAAQS or the City's $PM_{2.5}$ *de minimis* criteria. Additionally, the odor control units would not result in an exceedance of the 1 ppb significant odor threshold for sensitive receptors or the 10 ppb NYSAAQS in ambient air. Therefore, the Project would not result in significant adverse air quality impacts.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Operation of the Project would result in ~~2,415~~1,814 metric tons of carbon dioxide (CO_2) per year. Construction activities and use of construction materials are also associated with GHG emissions. Based on the Project commitment to energy efficiency and other sustainability measures under consideration, the Project would be consistent with the City's emissions reduction goals, as defined in the *CEQR Technical Manual*. The Project will also make the Gowanus Canal area more resilient to climate change and will incorporate measures to protect critical infrastructure from flooding. The Project would therefore be consistent with the City's climate change goals.

NOISE

The Project would not generate sufficient traffic to cause a 3 dBA (A-weighted decibels) increase in noise levels at any surrounding receptors; therefore there are no potential significant noise impacts from mobile sources. Stationary sources used for the building's mechanical systems and for facility operation (i.e., ~~emergency generators,~~ odor control systems, pumps, etc.) would meet all applicable noise regulations and would avoid producing noise levels that would result in any significant increases in ambient noise levels. Further, this equipment would be located either indoors or below grade without line of sight to nearby sensitive receptors. Therefore, there are no potential significant noise impacts from the Project's stationary sources on surrounding receptors.

The Project would include some type of publicly accessible open space at the Head End Site between Nevins Street and the Gowanus Canal. Potential noise levels at this open space would exceed the 55 dBA $L_{10(1)}$ CEQR threshold, but would be comparable to measured noise levels at other parks around the Gowanus Canal area and in New York City. Therefore, the Project's noise levels would not constitute a potential significant adverse noise impact at the publicly accessible open space.

PUBLIC HEALTH

Public health is the effort of society to protect and improve the health and well-being of its population. The goal of a public health analysis per the *CEQR Technical Manual* is to determine whether adverse impacts on public health may occur as a result of a project, and if so, to identify measures to mitigate such effects. The Project may result in unmitigated construction noise impacts. Therefore an assessment was performed to evaluate the potential for these potential temporary noise impacts to impact the health of the affected population by comparing it with the relevant health-based noise criteria as described in the *CEQR Technical Manual*, which identifies chronic exposure to high levels of noise, prolonged exposure to noise levels above 85 dBA (the *CEQR Technical Manual* recommended threshold for potential hearing loss), and episodic and unpredictable exposure to short-term impacts of noise at high decibel levels of concern for Public Health effects.

Even with the application of standard noise control measures, it was predicted that during construction, noise levels due to construction-related activities would result in noise levels at receptors in the vicinity of the project work areas that would constitute potential significant adverse impacts. The locations predicted to experience potential significant adverse impacts under either a five-day per week construction schedule or a seven-day per week construction schedule include 282 and 285 Nevins Street near the Head End Site staging area on Nevins and Sackett Streets.

Although the *CEQR Technical Manual* thresholds for significant adverse impacts are predicted to be exceeded at certain locations during construction, these exceedances would not constitute a significant adverse public health impact because of the temporary and intermittent nature of the construction noise. The maximum predicted construction noise levels (up to the mid-70s dBA) would occur over a limited duration during the construction period based on the amount and type of construction work occurring in the construction work areas. Furthermore, construction activity would be limited to a single shift during the day, leaving the remainder of the day and the evening unaffected by construction noise. Since the construction noise would fluctuate in level and would not occur constantly throughout the construction period, which itself is limited in duration, it would not be described as "chronic." Consequently, construction of the Project would not have the potential to result in chronic exposure to high levels of noise. Based on the predicted noise levels described in the Construction analysis, it is also not expected that construction of the Project would result in unpredictable exposure to short-term impacts of noise at high decibel levels. The maximum short-term noise impact resulting from construction of the Project would be in the mid-70s dBA, which would not be uncharacteristic of existing condition noise levels in the Gowanus neighborhood.

Since the area of potential noise impacts is limited and the population exposed to elevated noise levels due to construction is very limited and as described above, the noise would not be chronic, and would not exceed the threshold of short-term, high-decibel levels, the predicted noise resulting from construction of the Project would not constitute a potential significant adverse public health impact. Therefore, the Project would not result in potential significant adverse public health impacts.

NEIGHBORHOOD CHARACTER

This assessment examined the defining features of the existing neighborhood character in the area near the Head End Site and the Owls Head Site along the Gowanus Canal, and considers the potential effects of the Project on these defining features, which include its primarily industrial and commercial land uses, socioeconomic character, and historic resources, all of which are influenced by the historic presence of the Canal. The area's character is also partly defined by its public open spaces, such as the Thomas Greene Playground, and the recreational use of the Canal. This preliminary assessment did not identify any potentially significant adverse impacts to neighborhood character either singularly, or in combination with potential impacts in other relevant technical areas. Although the Project would result in a potential, significant adverse impact to historic resources, this impact would be mitigated, ensuring that there would be no potential impacts on the area's historic neighborhood character. Similarly, although the Project would result in potential temporary significant adverse noise impacts during construction, these impacts would be limited to the construction period and would only occur at receptors immediately adjacent to the construction areas, therefore they would not result in widespread noise impacts affecting the area's neighborhood character. Therefore, a detailed neighborhood character analysis is not necessary.

With the Project, the defining features of the neighborhood would remain unaffected, including its mix of land uses which contribute to the area's primarily industrial character. Furthermore, the Project would include elements that enhance the pedestrian experience and the character of the area, including publicly accessible elements at the Head End Site and certain landscaping elements at the Owls Head Site. Overall, the Head End and Owls Head Facilities would be consistent with the existing water and sewer infrastructure in the neighborhood, and would not detract from any of the neighborhood's defining features.

CONSTRUCTION

Construction of the Project—as is the case with most construction projects—would result in temporary disruptions in the surrounding area. However, DEP has committed to implementing a variety of measures during construction to minimize the effects of the Project on the nearby community, including:

COMMUNITY SAFETY

- A number of measures would be employed where appropriate to ensure public safety during the construction of the Project including the erection of sidewalk bridges, perimeter fencing, the potential employment of flag persons, and the installation of safety nettings;
- Maintenance and Protection of Traffic (MPT) plans would be developed for any temporary sidewalk, lane, and/or street closures. Approval of these plans and implementation of the closures would be coordinated with NYCDOT's Office of Construction Mitigation and Coordination (OCMC); and
- All New York City Department of Building (DOB) safety requirements and protocols would be followed and construction of the Project would be undertaken so as to ensure the safety of the community and the construction workers themselves.

ENVIRONMENTAL PERFORMANCE

Measures would be taken to reduce pollutant emissions during construction of the Project in accordance with all applicable laws, regulations, and building codes. These include the following dust suppression measures and idling restrictions:

- *Dust Control.* To minimize fugitive dust emissions from construction activities, a fugitive dust control plan including a robust watering program would be required as part of contract specifications. For example, all trucks hauling loose material would be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the Project Site; and water sprays would be used for all demolition, excavation, and transfer of soils to ensure that materials would be dampened as necessary to avoid the suspension of dust into the air. Loose materials would be watered, stabilized with a chemical suppressing agent, or covered. All measures required by the DEP's *Construction Dust Rules* regulating construction-related dust emissions would be implemented.
- *Idling Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time would be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or are otherwise required for the proper operation of the engine.

Construction of the Project is subject to New York City Local Law 77, which requires the use of ULSD fuel and Best Available Technology (BAT) for equipment at the time of construction.

- *Clean Fuel*. ULSD fuel would be used exclusively for all diesel engines throughout the project area.
- *Best Available Tailpipe Reduction Technologies*. Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the project) including but not limited to concrete mixing and pumping trucks would utilize the BAT technology for reducing DPM emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed by the original equipment manufacturer or retrofitted. Retrofitted DPFs must be verified by USEPA or the California Air Resources Board. Active DPFs or other technologies proven to achieve an equivalent reduction may also be used.

In addition, the following measures for hazardous material handling, noise mitigation, and tree protection, replacement and/or restitution would be taken:

- Subsurface construction/remediation work conducted on the Head End Site for the construction of the CSO Facility would, per the Settlement Agreement between USEPA and the City, be conducted as a Removal Action. DEP would prepare a Plan for USEPA approval setting out the procedures to be followed during the CP-2 construction phase of the Project;
- Construction of the Project would not only include noise control measures as required by the *New York City Noise Control Code*, but may also include measures such as the use of quieter equipment, where practicable;
- Construction of the Project would be performed in compliance with the NYC Parks Tree Protection Protocol. In addition, all landscaping and tree replacement and/or restitution for removed trees would be performed in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York.

With the implementation of the measures described above, the construction effects of the Project on the surrounding area would be substantially reduced. However, as described in detail below, even with these measures in place, construction activities associated with the Project would result in temporary significant adverse noise impacts as well as potential significant adverse impacts to historic and cultural resources. Additional information for key technical areas is summarized below.

TRANSPORTATION

In consultation with DEP, a detailed traffic analysis was performed at seven locations during the 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours during the peak construction quarter of CP-2 in 2024. Analyses performed for these locations showed that the Project would not result in any significant adverse transportation impacts during construction.

AIR QUALITY

An emissions reduction program would be implemented to minimize the effects of construction activities on the surrounding community. Measures would include, to the extent practicable, dust suppression measures, use of ULSD fuel, idling restrictions, diesel equipment reduction, best available tailpipe reduction technologies, and the utilization of newer equipment. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both nonroad and on-road sources determined that $PM_{2.5}$ and PM_{10}, annual-average nitrogen dioxide (NO_2), and carbon monoxide (CO) concentrations would be below their corresponding *de minimis* thresholds or NAAQS, respectively. In addition, maximum predicted concentrations from the simultaneous construction at the Head End and Owls Head Sites would not result in combined concentrations above the applicable NAAQS or the *de minimis* thresholds. The predicted non-criteria pollutant concentrations from the groundwater treatment systems would not exceed the applicable Short-term Guideline Concentrations (SGCs) and the Annual Guideline Concentrations (AGCs). Finally, to assess and mitigate odors to the greatest extent practicable, DEP would implement a CAMP during these activities and all necessary means would be employed to prevent on- and off-site odor nuisances. Therefore, no significant adverse air quality impacts are predicted from the construction of the Project.

NOISE

The detailed noise analysis concluded that construction of the Project has the potential to result in noise levels that exceed *CEQR Technical Manual* noise impact criteria construction at nearby residences, hotels, and publicly accessible open spaces for an extended period of time during CP-2. Construction of the Project would result in comparable or lower noise level increases during CP-1 and CP-3 construction, but these increases ~~may~~ still result in exceedances of *CEQR Technical Manual* noise impact criteria.

- At the residential receptors at 282 Nevins Street and 285 Nevins Street, located adjacent to and across Nevins Street from the Head End Site staging area, respectively the Project is predicted to result in potential temporary significant adverse construction noise impacts. Construction of the Project would result in noticeable and potentially intrusive increases in noise levels at these receptors intermittently over the course of construction.~~,~~ Throughout the Project, ~~during CP-2 this is~~ this is primarily as the result of equipment and dump truck~~s~~ activity in the Head End Site staging area and construction traffic along Nevins Street, with additional contributions during conveyance work ~~in~~during CP-3. Interior noise levels during construction would be in the ~~high~~ mid 40s dBA (approximately ~~5~~2 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines). The provision of storm windows or other building façade improvements would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the buildings' window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the building. Consequently, there would be no feasible or practical mitigation measures to reduce or avoid the predicted potential significant adverse construction noise impacts at these receptors.

- At open space areas in the vicinity of the proposed construction work areas, including Thomas Greene Playground which contains the Douglass and DeGraw Pool, the Whole Foods Market Open Space, and the Gowanus Canal, noise levels during construction would exceed *CEQR Technical Manual* noise impact criteria and *CEQR Technical Manual* noise exposure guidelines, although existing noise levels at these locations already exceed these noise exposure guidelines. While total construction noise levels at these receptors would be noticeable and potentially intrusive during the most intensive construction activities (i.e., the excavation portion of CP-2), they would be in the typical range for the Gowanus Canal area and would not occur during the evening and weekend time periods that are the primary times of use for these areas. Further, the western portion of Thomas Greene Playground and the Gowanus Canal are primarily used for active recreation, and are consequently not as sensitive to noise as a purely passive open space. Consequently, the predicted levels of construction noise were not determined to rise to the level of a significant adverse effect at any open space receptors in the vicinity of the Project Sites.
- At other receptors near the construction work areas, noise levels resulting from construction during the most intensive construction activities (i.e., the excavation portion of CP-2 and conveyance work during CP-3) would be noticeable and potentially intrusive at times. However, they would be temporary and would generally not exceed typical noise levels for the Gowanus Canal area. The highest construction noise levels are predicted to occur for relatively short periods of time at most receptors, and would occur during daytime hours when residences and hotels are typically least sensitive to noise. Furthermore, the surrounding residences and hotels are constructed with insulated glass windows and appear to have alternate means of ventilation (i.e., air conditioning), which would allow for the maintenance of a closed window condition and consequently reduced interior noise levels. Similarly, future hotels and residences are expected to be constructed with insulated glass windows and an alternate means of ventilation (i.e., air conditioning). Open spaces near the Project construction work areas would be only partially affected, with portions of the open spaces further from the work areas experiencing less construction noise and remaining available for use. Based on the duration and magnitude of the increases, the absolute noise levels at the receptors, the time period of construction, and the sensitivity of the receptors, noise resulting from construction of the Project was determined not to rise to the level of a significant adverse noise impact.

VIBRATION

The buildings of most concern with regard to the potential for structural or architectural damage due to vibration are historic buildings and structures adjacent to the Head End and Owls Head Sites (i.e., the ASPCA Memorial Building, the Former R.G. Dunn and Company Building, and other buildings within the 2014 S/NR-eligible Gowanus Canal Historic District as directed by SHPO and LPC) and the Gowanus Canal structures and systems (e.g., the Canal’s bulkheads, pumps, sewer outlets, bridges, etc.).

Historic buildings and other structures located within 90 feet of the Project sites, as appropriate (pending consultation with DEP, SHPO, and LPC), would incorporate vibration monitoring, and peak particle velocity (PPV) during construction would not be permitted to exceed the 0.50 inches/second threshold. Vibration-producing equipment would not operate in proximity to non-historic structures that could potentially result in damage to these structures. Furthermore, construction of the Project would not result in extended periods of perceptible or annoying vibration at surrounding receptors. Therefore, construction of the Project would not have the potential to result in significant adverse vibration impacts.

HISTORIC AND CULTURAL RESOURCES

As discussed above, as the Gowanus Canal bulkheads are S/NR-eligible, removal and replacement of the bulkhead at either Project Site would result in a potential significant adverse impact. Therefore, consultation is being undertaken with SHPO and LPC to identify measures to avoid, minimize, or mitigate adverse impacts. Additionally, if archaeological resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

All of the buildings on the Head End Site (excluding a one-story building on the interior of Block 411, Lot 24 that was constructed ca. 1990) have been determined by SHPO to be architectural resources that contribute to the significance of the S/NR–eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that ~~D~~demolition of these S/NR-eligible properties would constitute a significant adverse impact to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. Therefore, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to ~~avoid or~~ minimize to the extent practicable the adverse impact that would occur through demolition.

Two individually S/NR-eligible architectural resources are located within 90 feet of the Head End Site: the ASPCA Memorial Building and the Former R.G. Dunn and Company Building. To avoid any inadvertent construction-related impacts to these resources during project construction, a Construction Protection Plan (CPP) would be prepared and implemented in consultation with SHPO and LPC and in conformance with the New York City Department of Building's *Technical Policy and Procedure Notice* #10/88. In addition, other properties located within the S/NR-eligible Gowanus Canal Historic District are located within 90 feet of either Project Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken among DEP and SHPO to determine what protection measures may be needed for these properties, if any, during construction of the Project.

In addition, if there are any Belgian block pavers on the surface of city streets that would be affected during potential in-street sewer line improvement construction, DEP, to the extent practicable and feasible, would salvage and reinstall usable pavers, or replace any unusable ones in kind.

NATURAL RESOURCES

As discussed above in "Natural Resources," modifications at both of the Project Sites would result in the temporary disturbance of NYSDEC littoral zone tidal wetland, and construction of outfall OH-007 at the Owls Head Site would have the potential to result in permanent impacts to NYSDEC littoral zone tidal wetland within the footprint of the replacement bulkhead**.** DEP will explore options for avoiding potential impacts to wetlands. However, if potential impacts to wetlands are unavoidable, DEP will explore mitigation options with USACE, NYSDEC, and USEPA, particularly for the small areas of vegetated marsh near the Owls Head Facility.

HAZARDOUS MATERIALS

Properly managed, the deep excavations and dewatering required for construction of the tanks at both Project Sites ultimately would have beneficial effects related to hazardous materials, as these activities would remove contamination from the site. For the Head End Site, this removal would be to a greater extent than would likely occur with only National Grid's cleanup of the site; NYSDEC does not typically require such deep excavation for cleanup, even if deep contamination is present.

However, without proper controls, construction activities could result in unacceptable exposures to hazardous materials by construction workers, the general public and/or the environment. To avoid such exposures, the measures summarized above in "Hazardous Materials" would be incorporated into the Project (final requirements would be specified by the designers and included in the bid documents) to reduce the potential for significant adverse impacts to a greater extent practicable during Project construction. With implementation of the measures construction of the Project would not result in any potential significant adverse effects related to hazardous materials. Following construction, residual contamination would remain at both sites, but construction would have capped the disturbed areas preventing exposure. Any residual contamination would be subject to NYSDEC (and potentially USEPA) controls, through Site Management Plans.

ALTERNATIVE CONSTRUCTION SCHEDULE SCENARIO

In order to make up for weather delays and/or to accelerate the project construction schedule as determined by the construction contractor, there is the potential for some construction work to occur on weekends. Overall, if regular weekend work is to become necessary, construction of the Project under the Alternative Construction Schedule would result in the same or similar impacts. However, this scenario would result in different results from those identified above for the Project in the area of air quality and noise (and subsequently open space) that would not result in different impacts.

Air Quality

Construction of the Project under the Alternative Construction Schedule Scenario would not result in changes to short-term analysis period (i.e., 1-hour, 8-hour, and 24-hour) results presented for the Project since the level of construction activities during a weekend workday would be comparable to those for a weekday workday. However, the annual air quality concentrations due to construction would be higher for the Alternative Construction Schedule Scenario since there would potentially be more construction activities over an annual period (seven days per week rather than five days per week). The dispersion modeling analysis of construction-related air emissions under the Alternative Construction Schedule Scenario determined that annual-average $PM_{2.5}$ and NO_2 concentrations would be below their corresponding *de minimis* thresholds or NAAQS, respectively.

Noise

Construction of the Project under the Alternative Construction Schedule Scenario is predicted to result in in potential significant adverse construction noise impacts at the residential receptors at 282 and 285 Nevins Street. These are the same locations that were identified as potentially experiencing significant adverse noise impacts as a result of construction of the Project with only weekday construction.

At open space areas in the vicinity of the proposed construction work areas, including the western portion of the Thomas Greene Playground and the Gowanus Canal, noise levels during construction of the Project under the Alternative Construction Schedule Scenario would exceed *CEQR Technical Manual* noise impact criteria and *CEQR Technical Manual* noise exposure guidelines, although existing noise levels already exceed these noise exposure guidelines. The Project under the Alternative Construction Schedule Scenario would not result in significant adverse construction noise impacts at these receptors, because the active recreation areas are not as sensitive to noise as purely passive open spaces, and the predicted levels of noise at the passive open spaces would not rise to the level of significant adverse noise impacts.

At other receptors near the construction work areas, noise levels due to construction of the Project under the Alternative Construction Schedule Scenario would be noticeable and potentially intrusive at times during the most intensive construction activities (i.e., the excavation portion of CP-2 and conveyance system installation during CP-3), however they would be in the range considered typical for the Gowanus Canal area. Furthermore, the surrounding residences and hotels are constructed with insulated glass windows and appear to have alternate means of ventilation (i.e., air conditioning), which would allow for the maintenance of a closed window condition and consequently reduced interior noise levels. Similarly, future hotels and residences are expected to be constructed with insulated glass windows and an alternate means of ventilation (i.e., air conditioning). Therefore, the predicted levels of construction noise were not determined to rise to the level of a significant adverse impact at these residential, hotel, or other indoor noise receptors.

ENVIRONMENTAL JUSTICE

Five of the study area's 21 block groups have been determined to be a potential environmental justice area, based on the presence of low-income and minority populations higher than the thresholds provided in NYSDEC's Policy. As discussed above, the Project Sites are immediately surrounded by a predominance of industrial and manufacturing uses, and the Project is not expected to result in any potential significant adverse impacts, other than permanent impacts to certain architectural and archeological resources due to excavation and demolition of structures during the construction phase and temporary construction-related noise impacts.

Demolition of the industrial buildings on the Head End Site and potential archeological impacts would not be expected to result in disproportionate impacts on minority and low-income communities since these impacts would affect all populations, including those within potential environmental justice areas and those within non-minority and non-low income communities. In addition, the affected industrial buildings do not represent significant community resources whose loss would affect a potential environmental justice area, including those near the Head End Site. Therefore, the loss of these industrial buildings and certain archeological resources would not be expected to result in any significant adverse burden on potential environmental justice areas.

Construction-related noise impacts would temporarily affect one non-minority and non-low-income area. As discussed in "Mitigation," there are no feasible and practical mitigation measures that would be effective in reducing the amount of construction noise at these locations.

The additional burden of historic and cultural resources impacts on the potential environmental justice areas surrounding the Head End Site and temporary construction-related noise impacts on one non-environmental justice area near the Head End Site are not expected to be significant, given that these impacts would be limited and minimized to the greatest extent practicable, and existing burdens in the study area, such as the presence of vacant, underused industrial and manufacturing buildings and potentially contaminated properties, are expected to improve in the future analysis year.

ALTERNATIVES

The purpose of an alternatives analysis is to examine reasonable and feasible options that may avoid or reduce project-related significant adverse impacts while still achieving the stated goals and objectives of the Project. This analysis considered two alternatives as summarized below.

HEAD END FACILITY ALTERNATIVE SITE AKA PARK PROPERTY ALTERNATIVE

Under the Park Property Alternative, the Head End Facility would be located on a portion of the Thomas Greene Playground. As previously discussed, under the Settlement Agreement[13] issued by USEPA directing DEP to construct the Head End Facility, if the land at the preferred location (the Head End

[13] Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery, June 9, 2016, USEPA.

Canal-side Property) could not be acquired within the allotted timeframe, USEPA may direct that the Head End Facility be constructed at the Thomas Greene Playground, located to the east of the Head End Site across Nevins Street (Block 419, Lot 1; referred to as the Park Property). Under this alternative, the Head End Facility would not be constructed at the Head End Canal-side Property, but would instead be constructed on the western portion of the Park Property. As with the Project, to support the construction for the Park Property Alternative, DEP would lease or acquire the property at 270 Nevins Street (Block 425, Lot 1) to use as a construction staging area. There would be no changes to the Owls Head Facility or to the Gowanus Canal sewershed under this alternative.

The Park Property Alternative would result in the construction and operation of a CSO facility similar to the Head End Facility (on the Park Property), which would have similar environmental effects. However, unlike the Project, this alternative would have the potential to result in a significant adverse impact to open space as a result of the displacement of a portion of Thomas Greene Playground. Although some elements of the Thomas Greene Playground would be reconstructed, locating the CSO facility in the park would result in the loss of parkland; this loss of parkland may require legislation for alienation of parkland. Similarly, the displacement of this open space resource would be inconsistent with public policies that aim to increase public open space (in particular the WRP. Construction of the CSO facility's above-grade structure on the Park Property would result in substantial shadows falling on adjacent park areas, which would likely cause potential significant adverse shadows impacts, and the loss of natural features associated with the park (in particular mature street trees) would detract from the pedestrian experience in the area. In addition, during construction of the CSO facility, there would be increased noise levels within the eastern portion of the park (up to approximately 12 dBA higher than construction noise levels resulting from construction of the Project at the Head End Site), which would constitute a significant adverse impact. Overall, this alternative would result in significant negative effects on the Thomas Greene Playground and its usability, and the loss of usable space within this open space resource could alter the neighborhood character of the area to a greater extent than the Project.

As with the Project, this alternative would have a direct impact on architectural resources, since it would similarly require the demolition of the building at 270 Nevins Street, which contributes to the significance of the State/National Register (S/NR)-eligible Gowanus Canal Historic District, although there would be a reduced impact as this alternative would not require the demolition of the other buildings on the Head End Site (242 Nevins Street and 234 Butler Street). Likewise, if archaeological resources are present in the Park Property and retain both integrity and significance, this alternative, as with the Project, would result in a significant adverse impact on archaeological resources, which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

Construction of the Park Property Alternative is also expected to require a longer overall duration, with additional excavation activities, street, and sidewalk closures, as compared to construction of the Head End Facility, in particular because the conveyance conduits would need to be constructed at a longer and greater depth, the tanks would need to be constructed at a greater depth, and additional utility relocation and park reconstruction activities would be required. Although the Park Property Alternative would result in largely similar construction effects as the Project, as noted above, it would result in a significant adverse noise impact on the eastern portion of the Thomas Greene Playground, whereas the Project is not expected to result in a significant adverse construction noise impact in this area.

OWLS HEAD FACILITY ALTERNATIVE SITE, AKA THE 6TH STREET ALTERNATIVE

Under the 6th Street Alternative, the Owls Head Facility would be located along 6th Street on Block 979, Lots 18 and 23. The City conducted a Siting and Planning Study to examine alternative locations for a

CSO tank to satisfy the USEPA ROD mandate. The City's the Siting and Planning Study [14] recommended that the CSO tank be at the preferred location. The Siting and Planning Study also considered, but rejected, an alternative location for the Owls Head Facility to the east of the Owls Head Site along 6th Street (Block 979, Lots 18 and 23; referred to as the 6th Street Property). There would be no changes to the Head End Facility or the Gowanus Canal sewershed under this alternative. Unlike the Head End Site, the City is not under a USEPA order directing the City to construct the Owls Head tank at the preferred alternative.

The 6th Street Alternative would result in the construction and operation of a CSO facility on the 6th Street Property similar to the Owls Head Facility on the 6th Street Property. Although the 6th Street Property may have more extensive contamination as compared with the Owls Head Site due to its historical uses, standard remediation techniques would be employed to address that contamination in a manner similar to the remediation of the Owls Head Facility. This alternative would require the displacement of different businesses than would be displaced for the Owls Head Facility; in particular, this alternative would displace a self-storage facility that is currently under construction on the 6th Street Property. However, given the adequate availability of self-storage options in the socioeconomic study area and the City as a whole, the displacement of this self-storage facility would not affect business conditions in this particular industry sector and its economic viability within or outside the socioeconomic study area, and, as with the Project, this alternative would not result in any significant adverse impacts to socioeconomic conditions.

This alternative may result in different adverse effects than those identified for the Project as construction of the facility under this alternative would result in noise levels at the Whole Foods Market open space that are up to approximately 8 dBA higher than the noise resulting from construction of the Project at the Owls Head Site. The noise levels at the Whole Foods Market open space resulting from construction under the 6th Street Alternative would constitute a significant adverse impact not identified for construction of the Project at the Owls Head Site. While this is not desirable, there is no effective practical mitigation[15] that could be implemented to avoid these levels during construction. Noise levels in many parks and open space areas throughout the city, which are located near heavily trafficked roadways and/or near construction sites, experience comparable and sometimes higher noise levels.

MITIGATION

This analysis describes and evaluates feasible options for mitigation to reduce or eliminate to the maximum extent practicable the potential significant adverse impacts identified in this EIS. As discussed below, the Project has the potential to result in significant adverse impacts to historic and cultural resources and temporary significant adverse noise impacts during the construction period. Potential mitigation measures are identified below.

HISTORIC AND CULTURAL RESOURCES

Archaeological Resources

As described in "Historic and Cultural Resources" and summarized in **Table S-2**, portions of the Head End and Owls Head Sites and the surrounding streetbeds are considered to have archaeological sensitivity. If archaeological resources are present in any of the project site locations that retain both

[14] CSO Facility Site Recommendation Report for Owl's Head Outfall OH-007, Gowanus Canal, Brooklyn, New York, DEP, June 2015.

[15] Noise barriers would not be practical because of security concerns.

integrity and significance, the Project would result in a potential significant adverse impact which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

Table S-2
Potential Archaeological Resources and Recommendations for Future Analysis

Location within Project Sites	Potential Resource Type	Archaeological Research Value (if present)	Likely Integrity	Recommendation
Head End Site; Nevins Street	Prehistoric Site	High	Low	Archaeological Monitoring
Nevins Street	Tide Mill Complex	High	Low	Archaeological Monitoring
Owls Head Site; 2nd Ave; 7th Street	Battle of Brooklyn (Battle Action Corridor)	Low	Low	No further action
7th Street	Battle of Brooklyn (Soldier Burials)	High	Low	Archaeological Monitoring
Head End Site; Owls Head Site	Gowanus Canal (bulkhead and cribbing)	Moderate	High	Archaeological Monitoring if affected
Head End Site; Owls Head Site	Industrial Sites	Low	High	No further action

Sources: Lee, et al. 2011 and Loorya and Dietrich 2012.

Potential significant adverse impacts would be mitigated through additional archaeological analysis including monitoring during construction in consultation with LPC and SHPO. Recommendations for future archaeological analyses are presented in **Table S-2**. Consultation with SHPO and LPC is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites. Prior to the start of construction, an archaeological monitoring plan will be prepared that will identify the horizontal and vertical locations of Project elements that have the potential to impact archaeological resources and will describe monitoring procedures, including an unanticipated discoveries plan. Implementation of this monitoring plan would be sufficient to avoid, minimize, or mitigate adverse impacts of the Project.

Architectural Resources

There would be a potential significant adverse impact to ~~certain architectural resources~~the S/NR-eligible Gowanus Canal Historic District due to demolition of ~~State and National Register (~~S/NR~~)~~-eligible properties on the Head End Site; this demolition is necessary to complete the Project as mandated by USEPA. The Head End Site is located within the boundaries of a ~~proposed 2014~~ Gowanus Canal Historic District proposed for listing on the S/NR by SHPO in 2014 and determined S/NR-eligible in 2012. However in response to community comments, the New York State Board for Historic Preservation review for the State Register listing of the Gowanus Canal Historic District has been postponed.~~that did not go forward but was subsequently determined S/NR-eligible by SHPO~~. The Head End Site contains the buildings at 242-244 Nevins Street, 270 Nevins Street and 234 Butler Street (that include the two-story former Gowanus Station and associated one-story extensions on Butler and Nevins Streets) that contribute to the significance of the S/NR-eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that d~~D~~emolition of these buildings would constitute a significant adverse impact to architectural resources on the Head End Site and to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR.

As the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from USACE or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act of 1966. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA in consultation with SHPO and the City, will seek ways to minimize~~,~~ or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition, and ~~Therefore, DEP~~ is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York City on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (~~; this documentation~~which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential to~~incorporate some salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

CONSTRUCTION NOISE

Construction of the Project would be required to follow the *NYC Noise Control Code* for construction noise control measures. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *NYC Noise Control Code*. These measures could include a variety of source (i.e., reducing noise levels at the source or during the most sensitive time periods) and path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors). As discussed in "Construction," even with these noise control measures, construction of the Project would result in potential temporary significant adverse noise impacts at existing residences at 282 and 285 Nevins Street. Noise levels up to the mid-70s dBA were predicted to result from construction of the Project at these locations, resulting in noise level increases that would exceed *CEQR Technical Manual* impact criteria and absolute noise levels that would exceed *CEQR Technical Manual* noise exposure guidance at times throughout the construction of CP-2. While CP-1 and CP-3 construction would ~~be expected to~~ result in ~~lower~~ noise levels less than or comparable to those associated with CP-2, ~~based on the lower levels of materials traveling to and from the site,~~ noise levels from these construction phases ~~may~~ would, at times, exceed the *CEQR Technical Manual* impact criteria but not the *CEQR*

Technical Manual noise exposure guidance~~these criteria during those periods as well~~. Because the analysis is based on worst-case construction phases, it does not capture the natural daily and hourly variability of construction noise at each receptor. The level of noise produced by construction fluctuates throughout the days and months of the construction phases, while the construction noise analysis is based on the worst-case time periods only, which is conservative.

The predicted noise exposure for the occupants of the residential buildings where potential temporary significant adverse construction noise impacts were identified would depend on the amount of façade noise attenuation provided by the buildings. The façade noise attenuation is a factor of the building façade construction as well as whether the building's windows are able to remain closed. Buildings that have an alternate means of ventilation (e.g., some form of air conditioning) are assumed to be able to maintain a closed-window condition, which results in a higher level of façade noise attenuation. The existing residential buildings at 282 and 285 Nevins Street appear, based on field observations, to be constructed with standard building façade construction including insulated glass windows along with an alternate means of ventilation (i.e., window air conditioners) allowing for the maintenance of a closed-window condition. This construction would be expected to provide approximately 25 dBA window/wall attenuation[16]. With such measures, the residences at 282 and 285 Nevins Street would be subject to interior noise levels during construction in the ~~high~~ mid-40s dBA, up to approximately ~~5~~ 2 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines. The provision of storm windows or other building façade improvements would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the building. Consequently, there would be no feasible or practical mitigation measures to reduce or avoid the predicted potential temporary significant adverse construction noise impacts at these receptors.

UNAVOIDABLE ADVERSE IMPACTS

Potential unavoidable significant adverse impacts resulting from the Project have been identified for historic and cultural resource and noise during construction.

HISTORIC AND CULTURAL RESOURCES

As described in "Mitigation," demolition of properties that contribute to the significance of the S/NR-eligible Gowanus Canal Historic District on the Head End Site would have a potential significant adverse impact on architectural resources on the Project Site and to the S/NR-eligible Gowanus Canal Historic District. As the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from USACE or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act of 1966. If USEAP, in consultation with SHPO determined that the Project will have an adverse effect on historic properties, pursuant to Section 106, USEPA, in consultation with SHPO and the City, will seek ways to minimize~~,~~ or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement. Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition, and~~DEP~~ is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and

[16] Interior noise levels would be 25 dBA less than exterior noise levels. Standard façade construction using insulated glass windows typically provides approximately 25-30 dBA window/wall attenuation.

associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York City on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, it is expected that DEP under USEPA's supervision, would identify and develop mitigation measures that would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (~~; this documentation~~which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential to~~incorporate some salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

With these measures, the impact would be considered partially mitigated. As the potential significant adverse impact would not be fully mitigated, the proposed project would result in an unavoidable adverse impact on architectural resources.

CONSTRUCTION NOISE

As discussed in "Mitigation," construction of the Project would be required to follow the *NYC Noise Control Code* for construction noise control measures. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *NYC Noise Control Code*. These measures could include a variety of source (i.e., reducing noise levels at the source or during the most sensitive time periods) and path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors). As discussed in "Construction," even with these noise control measures, construction of the Project would result in potential temporary significant adverse noise impacts at existing residences at 282 and 285 Nevins Street. Noise levels up to the mid-70s dBA were predicted to result from construction of the Project at these locations, resulting in noise level increases that would exceed *CEQR Technical Manual* impact criteria and absolute noise levels that would exceed *CEQR Technical Manual* noise exposure guidance at times throughout the construction of CP-2. While CP-1 and CP-3 construction would ~~be expected to~~ result in ~~lower~~ noise levels ~~based on the lower levels of materials traveling to and from the site~~less than or comparable to those associated with CP-2, noise levels from these construction phases would, at times ~~may~~ exceed the *CEQR Technical Manual* impact ~~these~~ criteria, but not the *CEQR Technical Manual* noise exposure guidance ~~during those periods as well~~. Because the analysis is based on worst-case construction phases, it does not capture the natural daily and hourly variability of construction noise at each receptor. The level of noise produced by construction fluctuates throughout the days and months of the construction phases, while the construction noise analysis is based on the worst-case time periods only, which is conservative.

The predicted noise exposure for the occupants of the residential buildings where potential temporary significant adverse construction noise impacts were identified would depend on the amount of façade noise attenuation provided by the buildings. The façade noise attenuation is a factor of the building façade construction as well as whether the building's windows are able to remain closed. Buildings that have an alternate means of ventilation (e.g., some form of air conditioning) are assumed to be able to maintain a closed-window condition, which results in a higher level of façade noise attenuation. The existing residential buildings at 282 and 285 Nevins Street appear, based on field observations, to be constructed with standard building façade construction including insulated glass windows along with an alternate means of ventilation (i.e., window air conditioners) allowing for the maintenance of a closed-window condition. This construction would be expected to provide approximately 25 dBA window/wall attenuation[17]. With such measures, the residences at 282 and 285 Nevins Street would be subject to interior noise levels during construction in the ~~high~~ mid-40s dBA, up to approximately ~~5~~ 2 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines. The provision of storm windows or other building façade improvements would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the building. Consequently, there would be no feasible or practical mitigation measures to reduce or avoid the predicted potential temporary significant adverse construction noise impacts at these receptors.

GROWTH-INDUCING IMPACTS OF THE PROJECT

Although the Project would include the construction of new sewer infrastructure, it would not result in an expansion of the sewer infrastructure capacity. Rather, the two CSO facilities would divert existing flows to reduce the overflow of CSO solids into the Canal. The area that would be served by the Project is a well-developed portion of Brooklyn containing primarily commercial, light-industrial, and residential uses that is served by the existing combined sewer system; therefore, the Project would not result in an expansion of sewer infrastructure in an area that lacks sewer service, and would not result in induced development through new sewer service.

Independent of the Project, DCP is conducting a comprehensive planning study of the Gowanus neighborhood in order to develop a future development framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study area being rezoned to allow for residential use, among other uses and goals of the study, which is not presently permitted by the existing zoning in the area. However, the planning study is currently in its preliminary stages and its outcome and where new residential uses might be permitted is currently unknown. Any new residential development in the area near the CSO facilities that may occur as a result of the potential rezoning would be independent of the Project. The CSO facilities would not independently increase the sewer capacity available to potential new redevelopment and the Project would not induce new development.

In addition, the CSO facilities would not result in a significant increase in property values, which reflect a greater potential for redevelopment, because they are not introducing a substantial new use to the area that could considerably alter or accelerate existing market trends. Therefore, the Project would not result in an

[17] Interior noise levels would be 25 dBA less than exterior noise levels. Standard façade construction using insulated glass windows typically provides approximately 25-30 dBA window/wall attenuation.

expansion of the sewer infrastructure capacity, and is not anticipated to induce additional development beyond the CSO Facilities Project Sites.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resources, both natural and man-made, would be expended in the construction of and operation of the Gowanus CSO facilities. These resources include the building materials; energy in the form of fuel and electricity used in construction of the CSO facilities; energy in the form of fuel and electricity during the operation of the CSO facilities by various mechanical and processing systems; and the human effort (time and labor) required to develop, construct, and operate the Project. The commitment of resources and materials for the Project (e.g., land, building materials, energy in the form of fuel and electricity, and time and labor efforts) were weighed against the Project's purpose and need to conform to the UESPA ROD requirement to prevent recontamination of the Canal following the implementation of remedial actions.

The CSO facilities would occupy a minimal amount of land, limited to portions of the Head End and Owls Head Sites. The Head End Site and the Owls Head Site were identified as the preferred sites due in large part to their locations adjacent to outfalls RH-034 and OH-007, respectively, which provide minimal distance for conveyance, resulting in a more efficient design and construction effort. Therefore, the Project would utilize the minimum amount of land necessary to construct the CSO facilities and related conveyance as required by the USEPA mandate, and the Project would not constitute a significant commitment of land resources.

As discussed previously, the Head End Facility and the Owls Head Facility would be largely automated and would not require permanent staffing. The CSO facilities are expected to be in operation approximately 40 to 50 times during a typical year and are estimated to require a total of approximately 10.5 million BTUs per year. This energy consumption would be considered negligible in comparison to the approximately ~~376~~ 368 trillion BTUs provided by Con Edison within the New York City and Westchester County service area annually. Therefore, the Project would not result in a significant commitment of labor or energy resources.

Although construction of the Project would require a commitment of sustainable building materials, to the extent practicable, the Project would use materials with recycled content, including concrete and steel to reduce the intensity of carbon emissions related to construction. The Project would also evaluate the use of natural gas, a lower carbon fuel, and a roof-mounted photovoltaic system (solar power) for the normal operation of the HVAC systems.

In conclusion, the Project would utilize the minimum amount of land necessary and would result in a negligible commitment of other resources such as labor, energy, and building materials. In addition, the Project would meet the goals of the USEPA ROD. ✷

Chapter 1: Project Description

A. INTRODUCTION

The New York City (City) Department of Environmental Protection (DEP) is issuing this ~~Draft~~ Final Environmental Impact Statement (~~D~~FEIS) pursuant to the New York State Environmental Quality Review Act (SEQRA), City Environmental Quality Review (CEQR), and the Uniform Land Use Review Procedure (ULURP). In accordance with SEQRA and CEQR, DEP is examining the potential for significant adverse environmental impacts that could occur as a result of the Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project. The Project is mandated by the United States Environmental Protection Agency (USEPA) to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, or Superfund).

The Canal is an approximately 1.8-mile-long, manmade waterway located in Brooklyn, Kings County, New York (see **Figure 1-1**). In the early 19th century, the site where the Canal is now located was occupied by Gowanus Creek, local tributaries, and lowland marshes. In 1848, the State of New York authorized construction of the Canal in order to open the area to barge traffic, increase circulation and flushing, receive stormwater, and fill the adjacent lowlands for development. Construction of the Canal began in the 1860s by bulkheading and dredging the creek.

Following its construction, the Canal quickly became one of the nation's busiest industrial waterways, serving heavy industries in the area that included coal yards, cement manufacturing, tanneries, paint and ink factories, machine shops, chemical plants, oil refineries, and three manufactured gas plants (MGPs).

In 1911, the City began operating the Gowanus Canal Flushing Tunnel—a pumping system and mile-long tunnel—with the goal of improving the Canal's overall water quality. The Flushing Tunnel improved circulation and flushed stagnant water from the Canal by pumping from the head of Gowanus Canal to Buttermilk Channel, a small tidal strait that separates Governors Island from Brooklyn (see **Figure 1-1**). The Flushing Tunnel operated until the mid-1960s and was rehabilitated and reactivated in 1999. At that time, the direction of flow was reversed to bring more highly oxygenated water from Buttermilk Channel to the head of the Canal.

On March 2, 2010, the Canal was designated a federal Superfund site under CERCLA and placed on the National Priorities List (NPL). The main goal of the CERCLA process is to remediate constituents of concern (certain hazardous substances) in the Canal sediments that were deposited over the Canal's long industrial history. On September 27, 2013, the USEPA issued a Record of Decision (USEPA ROD) identifying actions to be undertaken by various parties to remediate contamination in the Canal. As part of the USEPA ROD, USEPA mandated the design and construction of two CSO facilities.

B. PROJECT OVERVIEW

The first of the two CSO facilities, the "Head End Facility," would include an 8-million-gallon (MG) underground tank that would increase CSO capture for overflows that would otherwise be discharged from CSO outfall RH-034 at the "head end," or northernmost portion of the Canal (see **Figure 1-2**). Construction of the Head End Facility would require the lease or acquisition of three privately owned

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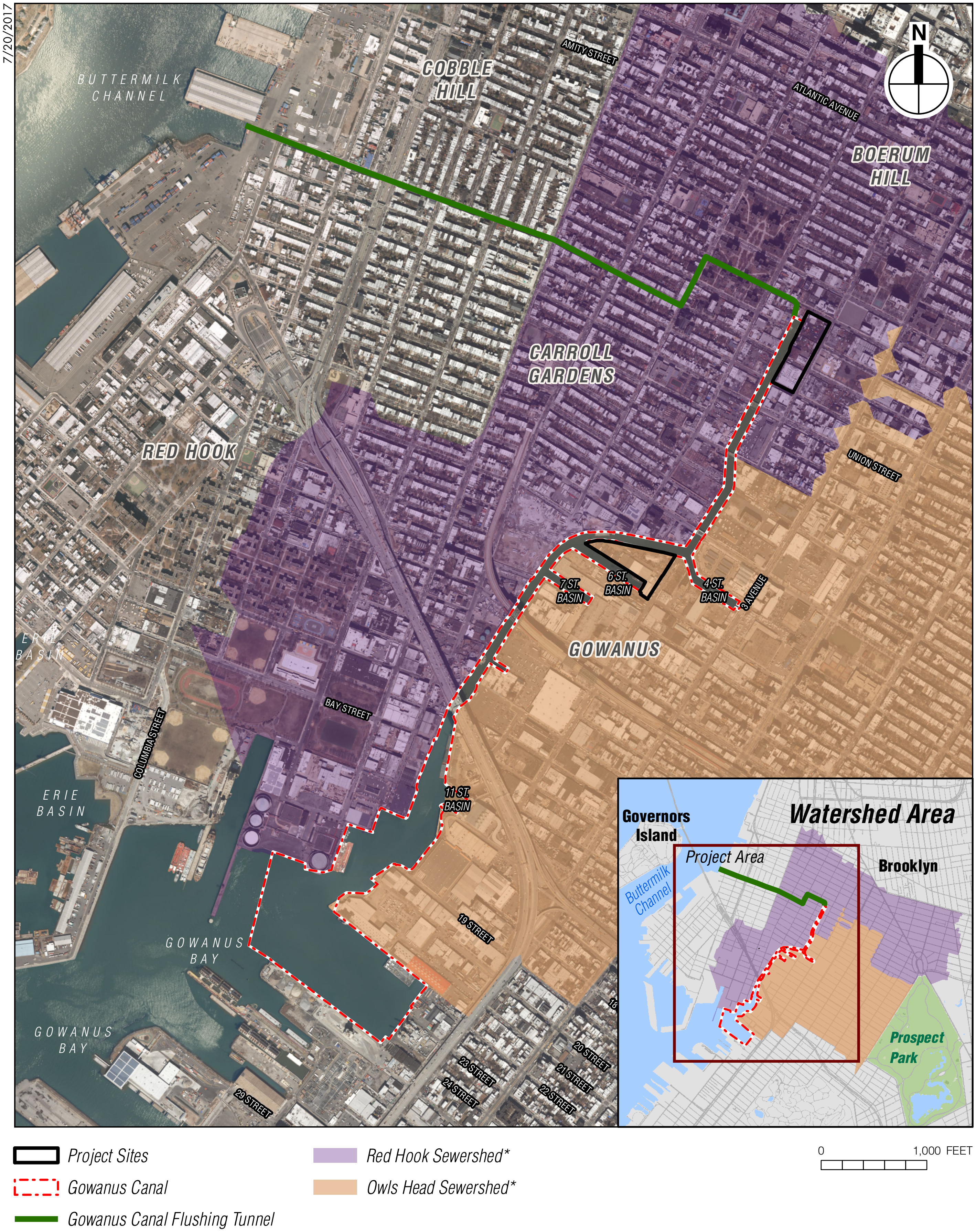

* Sewershed areas indicate the portions of the Gowanus Canal Watershed served by each WWTP

Gowanus Canal CSO Facilities

Project Area:
Gowanus Canal
Figure 1-1

Gowanus Canal CSO Facilities

Project Location

Figure 1-2

parcels adjacent to the Canal[1] and is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1).

The second facility, the "Owls Head Facility," would include a 4-MG tank that would increase CSO capture for overflows that would otherwise be discharged from CSO outfall OH-007. The Owls Head Facility would be located at the middle of the Canal (approximately 0.5 miles south of the northernmost portion of the Canal) near the northern terminus of 2nd Avenue near the 4th Street turning basin (see **Figure 1-2**).[2] Construction of the Owls Head Facility would require the use of one City-owned parcel (Block 977, Lot 3) and the lease or acquisition of up to four privately owned parcels adjacent to the Canal.[3] The Owls Head Facility is proposed to be located at 2 2nd Avenue (Block 977, Lot 3), 110 5th Street (Block 990, Lot 21), 122 5th Street (Block 990, Lot 16), 22 2nd Avenue (Block 990, Lot 1), and 5th Street (Block 977, Lot 1), with portions of this area used for construction staging.

Collectively, the Project includes the lease or acquisition of up to seven properties to support the Facilities and construction staging areas.

C. RECENT INVESTIGATIONS AND ACTIONS CONCERNING THE CANAL

Currently, the Canal is surrounded by a mix of residential, commercial, and industrial uses. The residential areas surrounding the Canal include the neighborhoods of Gowanus, Park Slope, Cobble Hill, Carroll Gardens, and Red Hook, with an increasing residential presence located near and along the waterway. Properties along the waterfront have historically been primarily commercial and industrial; in recent years, new residential developments have been constructed.

In October of 2016, the Department of City Planning, along with other City agencies, launched the Gowanus PLACES Neighborhood Planning Study, which seeks to foster and create a thriving, working, and more resilient neighborhood by reinforcing and encouraging a strong local economy anchored by a mix of uses and businesses, while creating opportunities for new housing with affordable housing in appropriate locations. In early 2017, as part of undertaking the Study, DCP began a community outreach process to gather feedback on a variety of topics before developing and sharing a draft planning and land use framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study areas being rezoned to allow for residential use, among other uses and goals of the study, which is not presently permitted by the existing zoning in the area. However, the planning study is currently in its preliminary stages and its outcome and where new residential uses could be permitted is not known at this time.

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[1] DEP will also be pursuing the demapping of the mapped portion of Douglass Street to correct the title and record for this portion of the Head End Facility—this portion of Douglass Street is mapped but unbuilt on portions of Block 418, Lot 1 and Block 411, Lot 24, located in the area to be developed with the Head End Facility. The demapping action is not necessary for the construction of the Head End Facility and will follow on a different schedule from the site selection and acquisition ULURP.

[2] The Canal has four short turning basins that branch to the east of the main channel at 4th Street, 6th Street, 7th Street, and 11th Street; a fifth turning basin located at 1st Street, has been filled in and would be restored independent of this Project as part of the mandated Superfund remediation of the Canal. Turning basins allow vessels in the Canal to turn and/or reverse direction.

[3] Construction of the Owls Head Facility would also require a site selection pursuant to the City of New York Charter. As described above, the site selection and acquisition actions and the demapping action will undergo separate review under ULURP. As described above and in more detail below, the demapping action is not necessary to facilitate the construction of the Owls Head Facility.

Therefore, for the purposes of this EIS and relevant analysis chapters, the existing zoning regulations and associated current patterns and trends applicable to the Head End Site, the Owls Head Site, and the study areas are assumed to remain in place in the 2028 analysis year.

Recent improvements in water quality in the Canal have been spurred by the area's general shift away from industrial activity to residential and commercial uses, as well as the investments made in compliance with the Clean Water Act, which imposed standards on discharges to the waters of the State. The City undertook a series of improvement projects around the Canal. Studies and actions related to the Canal and the regulatory background of the Project are described below.

RECENT DEP UPGRADES IN GOWANUS CANAL WATERSHED

As a result of the Gowanus Waterbody/Watershed Facility Plan (WWFP) discussed below, the City has upgraded the Gowanus Wastewater Pumping Station, which pumps wastewater to the Red Hook Wastewater Treatment Plant (WWTP), and has constructed a new mile-long force main from the pumping station to the Columbia Street/Red Hook Interceptor Sewer. In addition, the City designed and completed additional improvements to the Flushing Tunnel in 2014, including the installation of new pumps that deliver an average flow of 215 million gallons per day (MGD) and new screens, and improvements to the hydraulic grade line that result in more continuous pumping of oxygenated water to the Canal during low tide.

More recently, DEP has commenced construction and installation of High Level Storm Sewers (HLSS) in the Gowanus watershed area, which are generally located between Carroll Street and State Street near the northern end of the Canal, extending to 4th Avenue to the east (see **Figure 1-3**). Once completed, this HLSS project will create a separate stormwater discharge to the Canal through a stormwater outfall at Carroll Street and would reduce stormwater flows to the combined sewer system, which would reduce the frequency and volume of CSO into the Canal. The HLSS is a form of partial separation that separates stormwater from streets or other public rights-of-way from combined sewers. This separation of sewers would help reduce the amount of CSO that is discharged to the Canal, and would reduce street flooding. The first phase of the project (currently underway, with completion expected by the spring of 2018) includes improvements to the area south of Douglass Street; the second phase of construction (expected to begin in 2018 and completed in 2020) includes improvements to the area north of Douglass Street. As part of the project, 87 new catch basins will be installed to allow stormwater to drain from the streets into 14,000 linear feet of new high-level storm sewers. In addition, all existing catch basin drainage connections will be switched from the existing combined sewer to the new high-level storm sewers.

DEP has also invested in Green Infrastructure (GI) that has been constructed, is in construction, or is planned in the Gowanus watershed area, including bioswales in the right-of-way (ROWB) and stormwater greenstreets (SGSs) in the area north and east of the Canal (see **Figure 1-4**). GI uses vegetation, soils, and other elements and practices to capture, absorb, and filter stormwater. GI would also reduce the amount of CSO that may reach the Canal.

GOWANUS CANAL WATERBODY/WATERSHED FACILITY PLAN AND LONG TERM CONTROL PLAN

In 2008, DEP prepared the WWFP to document baseline conditions and identify early action items for CSO abatement in advance of the development of a Long Term Control Plan (LTCP) to control CSOs being discharged into the waterbody. The WWFP assessed compliance with existing water quality standards, and evaluated alternatives for meeting those standards. As a result of the WWFP, DEP committed to over $250 million of capital upgrades: as noted above, improvements included upgrading the Gowanus Wastewater Pumping Station and modernizing the Flushing Tunnel. Concurrently with

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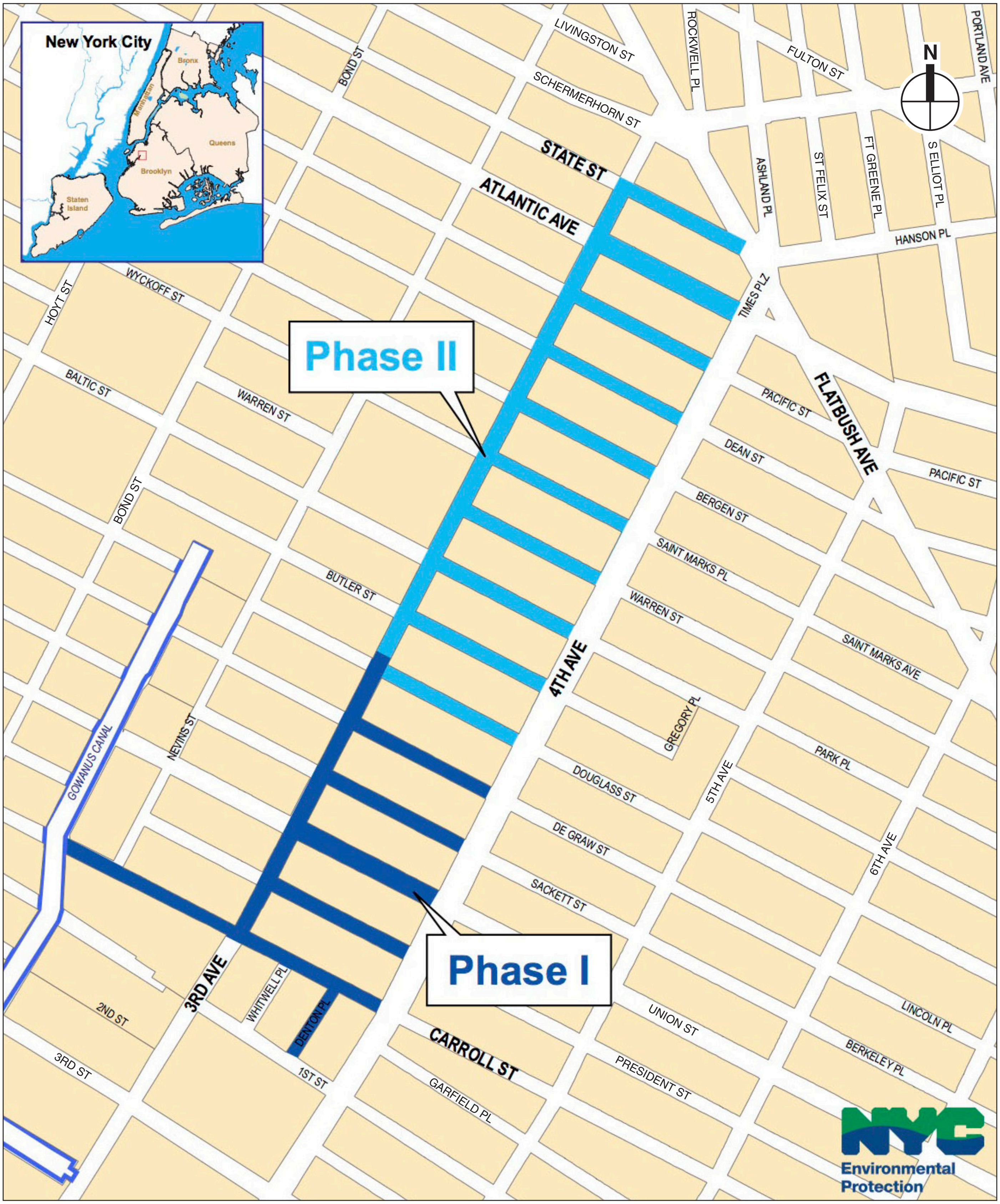
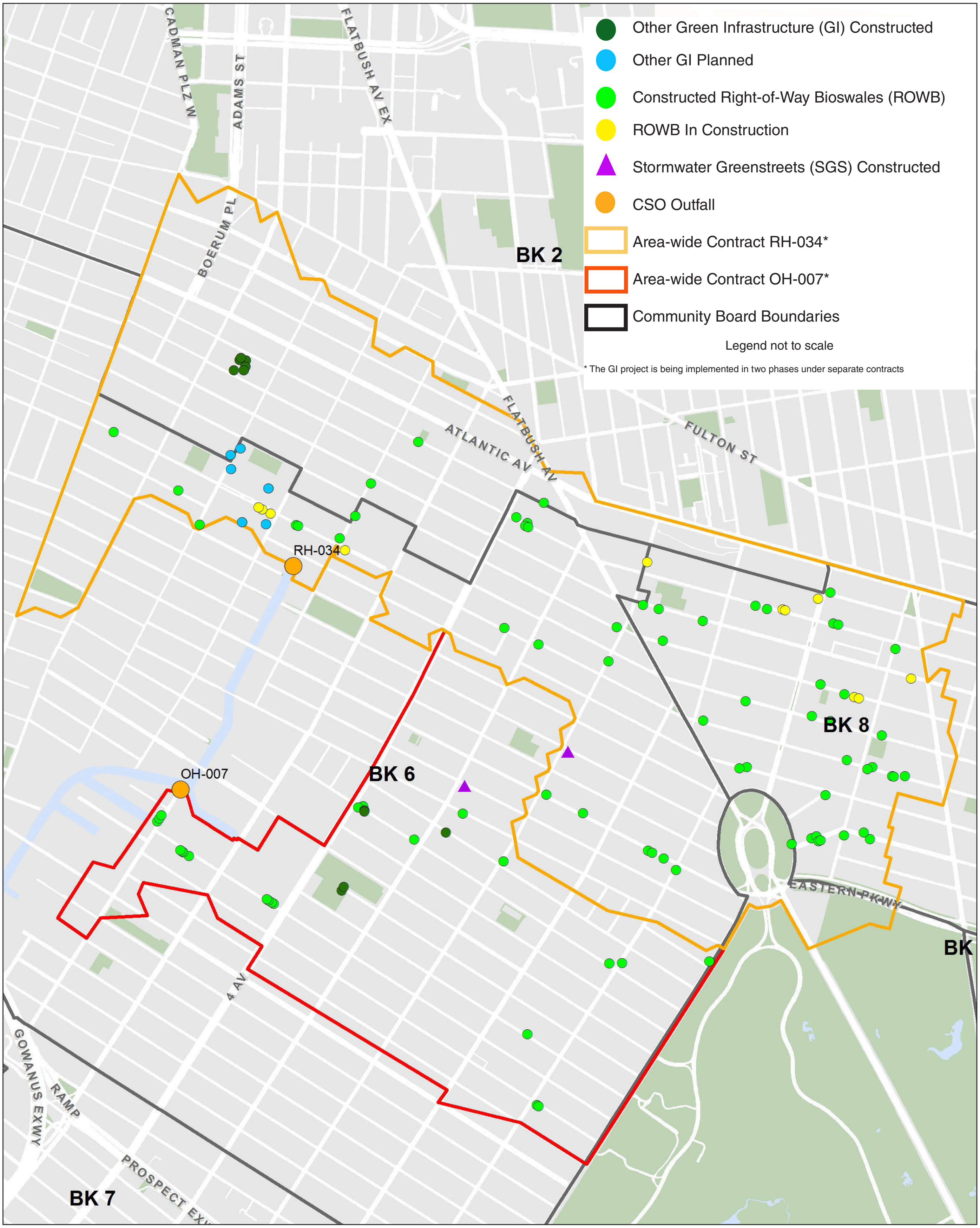


Source: *Gowanus Canal LTCP*

Gowanus Canal High Level Storm Sewers (HLSS)

Figure 1-3



Source: DEP Office of Green Infrastructure

Green Infrastructure (GI) Projects in Gowanus Canal Watershed

Figure 1-4

these upgrades, a Post Construction Compliance Monitoring (PCM) program was implemented to regularly collect samples from monitoring stations along the Canal and measure water quality. The PCM measures several markers of water quality, including levels of fecal coliform and enterococci (indicators of human waste and pathogenic bacteria), dissolved oxygen (DO; the oxygen in a waterbody available for aquatic life forms) and secchi disk transparency (the measure of clarity of surface waters, which affects the nutrient cycle by allowing in sunlight). For the period following the reactivation of the Flushing Tunnel (July 2014 to February 2015), the PCM data shows that these investments have resulted in substantial improvements to water quality in the Canal, with a reduction of fecal coliform and enterococci levels and improved DO concentrations.

In 2015, DEP prepared the LTCP for the Canal to identify the need for additional controls to achieve waterbody-specific water quality standards (WQS), consistent with Federal CSO policy[4] and the water quality goals of the Clean Water Act. The LTCP includes alternatives that consider a wide range of reductions in CSO—up to 100 percent CSO control—including investments that would be made by DEP through green and grey infrastructure. Intermediate levels of CSO volume control—approximately 50 percent and 75 percent—were also evaluated.

The LTCP determined that the existing WQS are being met as a result of the significant improvements achieved by the WWFP recommended plan (i.e., operation of the reactivated Flushing Tunnel and upgraded Gowanus Wastewater Pumping Station). In particular, the LTCP determined that water quality in the Canal met the standards for its New York State Department of Environmental Conservation (NYSDEC) classification[5] and that fecal bacteria levels in the Canal also met the WQS for primary recreational contact (recreational activities where the human body may come in direct contact with water, e.g., swimming or diving). In addition, the LTCP concluded that with the build-out of planned GI and HLSS in the area, water quality would further be improved.

Although existing water quality standards are being met, the USEPA ROD for the Gowanus Canal Superfund site directs the City to construct CSO controls that would serve to further improve water quality by reducing CSOs from being discharged to the Canal.

USEPA ROD AND CSO FACILITY SITING PROJECT

As noted above, the Canal was designated a federal Superfund site under CERCLA and placed on the National Priorities List in March, 2010. On September 27, 2013, the USEPA issued a ROD identifying actions to be undertaken by various parties to remediate contamination in the Canal. Unlike the Clean Water Act regulation of CSOs, which focuses on bacteria contamination and DO, CERCLA focuses on contamination caused by industrial pollutants. Accordingly, the USEPA ROD focuses on hazardous substances located in and beneath the Canal, primarily Non-Aqueous Phase Liquid (NAPL) and associated polycyclic aromatic hydrocarbons (PAHs), which were primarily discharged to the Canal from the three former MGPs that operated for over a century along the bank of or near the Canal. As part of the USEPA ROD, USEPA also mandated the construction of the Gowanus Canal CSO Facilities.

[4] The 1994 USEPA CSO Control Policy provides guidance to permittees and permitting authorities on the development and implementation of a LTCP in accordance with the provisions of the CWA. The CSO policy was first established in 1994 and codified as part of the federal Clean Water Act in 2000.

[5] NYSDEC has designated the Gowanus Canal Class SD above Hamilton Avenue, and Class I below Hamilton Avenue. The best usage of Class SD waters is fishing; the best usage of Class I waters is secondary contact recreation (recreational activities where contact with the water is minimal and where ingestion of the water is not probable, e.g., boating) and fishing.

In February 2014, DEP released a siting and planning study for the two CSO facilities. This effort included: (1) identification and evaluation of CSO facility components and development of facility footprints to be used in the identification of viable sites on which to locate the facilities, including the CSO tanks, conveyance, and associated infrastructure; and (2) identification of potential sites suitable for locating the CSO facilities, development and evaluation of a shortlist of potential sites, and preparation of conceptual designs associated with those sites.

In May 2014, USEPA issued a unilateral Administrative Order for Remedial Design (RD Order) which established milestones for the City to design the two CSO facilities. DEP evaluated a range of tank sizes and alternatives and assessed their performance against the USEPA ROD goal of 58 to 74 percent solids load reduction. DEP submitted Site Recommendation Reports for the Head End and Owls Head Facilities to USEPA in June 2015, which evaluated potential sites for the two CSO facilities.

A focused site screening effort was conducted to identify potential sites for locating the facilities, based on three critical criteria: size of available property; hydraulic analyses and effective capture of CSO; and current or planned land use in the area. The Site Recommendation Report for the Head End Facility evaluated two potential "shortlisted" sites for the Head End Facility—the Head End Canal-side Property, comprised of two privately owned parcels located at 242 Nevins Street and 234 Butler Street, and the Park Property, comprised of the City-owned Thomas Greene Playground property—and recommended the Head End Canal-side Property as the location for the Facility. This recommendation also included use of the privately owned parcel at 270 Nevins Street for construction staging, referred to as the RH-034 Staging Area Property. The Site Recommendation Report for the Owls Head Facility recommended the use of a City-owned parcel of land located at 5th Street and 2nd Avenue, together with adjoining privately owned parcels along 5th Street, collectively referred to as the Owls Head Site.

On June 9, 2016, USEPA issued a memorandum to file that states that the size of the two storage tanks should be 8-MG at RH-034 and 4-MG at OH-007. Also on June 9, 2016, USEPA issued an Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery (Settlement Agreement) directing DEP to construct the Head End Facility at the recommended location and requiring that DEP issue a DEIS for the Head End Facility by October 1, 2017. However, under the Settlement Agreement, under certain specified circumstances, USEPA retains the discretion to direct the City to construct the Head End Facility at an alternate site—the City-owned Thomas Greene Playground property, referred to as the Park Property (see **Figure 1-5**). In the Settlement Agreement, USEPA also agreed with DEP's recommended site for the Owls Head Facility.

INVESTIGATION AND REMEDIATION OF UPLAND SOURCES OF CONTAMINATION

According to the USEPA ROD, contaminants from upland sources along the Canal—including the Fulton Municipal Works MGP site, Carroll Gardens/Public Place (formerly known as the Citizens Gas Works MGP site), and the Metropolitan MGP site (see **Figure 1-6**)—have travelled to the Canal primarily by the migration of NAPL through subsurface soils and groundwater discharge of dissolved-phase contaminants. Although the MGP sites discontinued operations several decades ago, these contaminants continue to migrate into and impact the Canal. The investigation and remediation of these upland sources of contamination, including properties within National Grid's Remedial Investigation Parcel Boundaries, are to be addressed pursuant to administrative orders under the jurisdiction of NYSDEC in coordination with the remediation required under CERCLA. NYSDEC has issued a Record of Decision (NYSDEC ROD) that selected near- and long-term actions intended to prevent the migration of contamination from the former Fulton MGP site into the Canal, protect human health and the environment, and comply with New York State standards, criteria, and guidance.

Gowanus Canal

Head End Facility Alternative Site

Park Property Alternative

Outfall Locations

In-street Sewer Line Improvements

RH-034 Construction Staging Area*

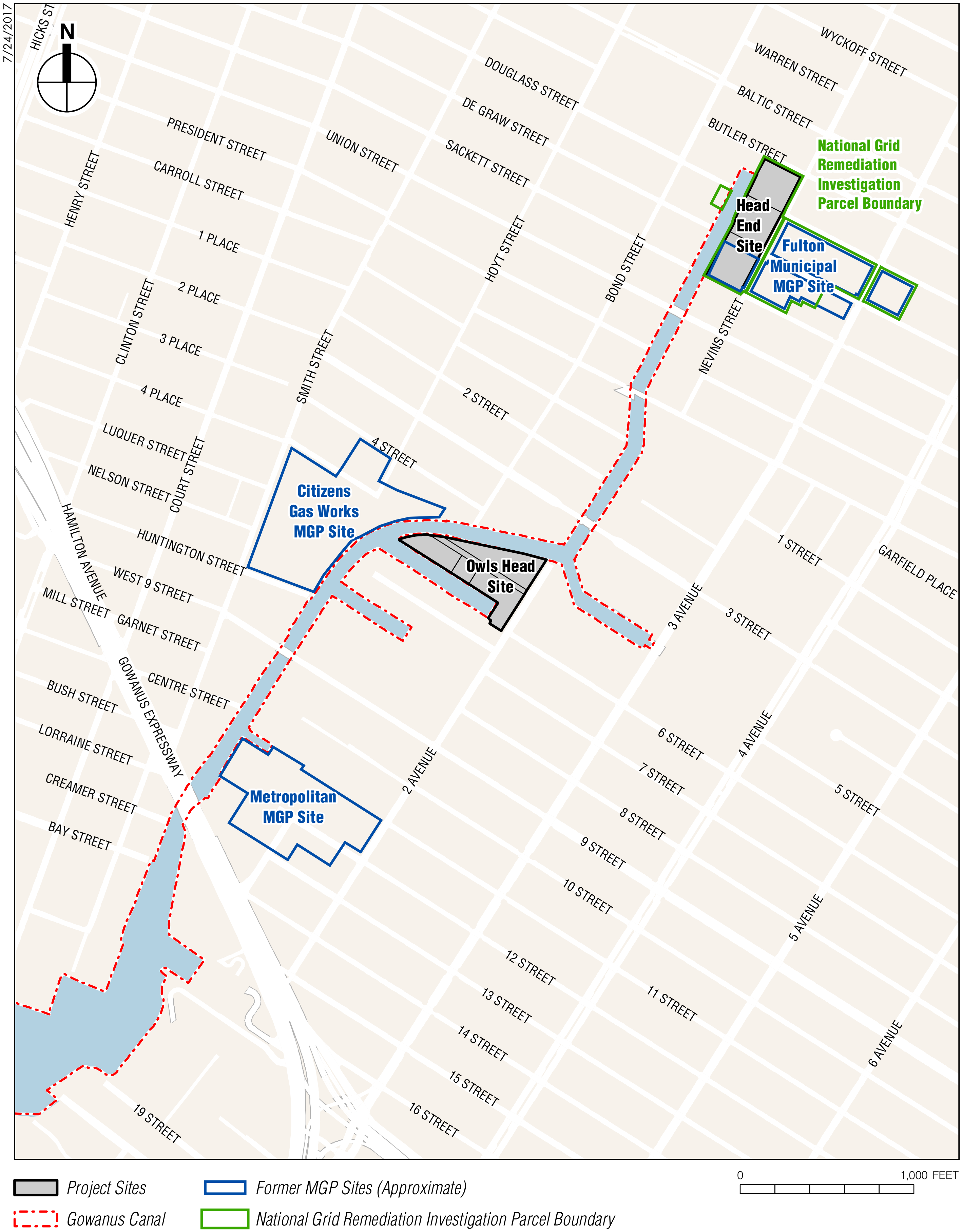
*NOTE: RH-034 Construction Staging Area Property would be used for both the Project and the Park Property Alternative

0 500 FEET

Gowanus Canal CSO Facilities

Head End Facility Alternative Site

Figure 1-5



Upland Sources of Contamination

Figure 1-6

Gowanus Canal CSO Facilities

The properties where the Head End Facility would be sited are located within National Grid's NYSDEC-directed Remedial Investigation study area and National Grid is responsible for the remediation of NAPL and other CERCLA hazardous substances at the Head End Facility properties. National Grid's remediation is outside the scope of this Project, and at this time, there is not sufficient information available concerning National Grid's investigations and remediation to enable them to be considered in this environmental review.

D. RED HOOK AND OWLS HEAD SEWERSHEDS AND WWTP SERVICE AREAS

DEP operates 14 WWTPs that receive wastewater flows from large geographic areas within the City; these areas, which typically include multiple neighborhoods, are referred to as WWTP service areas. The smaller geographic region within a WWTP service area in which all wastewater flows are conveyed to a single point, or outlet, before ultimately being conveyed to a WWTP, is typically referred to as a sewershed. The Gowanus Canal sewershed encompasses approximately 1,760 acres, of which approximately 1,600 acres are served by combined sewers that convey a combination of stormwater and sanitary sewage (combined sewer flow) to two WWTPs: the Red Hook (RH) and Owls Head (OH) WWTPs (see **Figure 1-1**).

In periods of dry weather, the dry weather flow conveyed by the combined sewer system consists of sanitary sewage. During and immediately after certain wet weather events, combined sewers can experience a much larger flow due to stormwater runoff collection. To control flooding at the WWTPs, as well as to protect drainage areas and private property, and reduce the frequency of street flooding, structures known as regulators are built into the combined sewer system to serve as relief points. Regulators prevent excess flow from entering the interceptors, which are larger sewers that convey wastewater to the WWTPs, during wet weather events. The regulators allow two times the amount of a WWTP's design dry weather flow into the interceptors. However, when flow exceeds two times the design dry weather flow, it is diverted by the regulator and runs by gravity through an outfall, known as a CSO. There are 12 combined sewer system outfalls that discharge to the Canal (see **Figure 1-7**); these outfalls have permits from NYSDEC. The two largest CSO outfalls (by volume) are RH-034 and OH-007 in the RH and OH service areas, respectively.

As noted above, the Canal's sewershed is partially within the RH WWTP's service area and partially within the OH WWTP's service area. The existing combined sewer system infrastructure in the RH and OH service areas is described below.

RED HOOK WWTP SERVICE AREA

The RH WWTP's service area is located in the northwest section of Brooklyn. As shown on **Figure 1-1,** the portion of the Canal's sewershed within the RH WWTP's service area is generally located to the north and west of the Canal; the service area also extends on the east side of the Canal down to Carroll Street. Flow from this area is directed to the RH WWTP for treatment.

During certain wet weather events, combined flow from up to seven CSO outfalls is discharged to the Canal from the RH service area (see **Figure 1-7**). Outfall RH-034 discharges the greatest amount of CSO, as measured by activation frequency and overflow volume. RH-034 is located adjacent to the Gowanus Wastewater Pumping Station at the head of the Canal.

Wastewater flows are served by two pumping stations in the area: the Gowanus Wastewater Pumping Station and the Nevins Street Pumping Station (located on Nevins Street near the intersection of Degraw Street) (see **Figure 1-8**).

7/20/2017

Project Sites
Gowanus Canal
CSO Outfall
Storm Outfall
Pumping Station
Red Hook Sewershed*
Owls Head Sewershed*

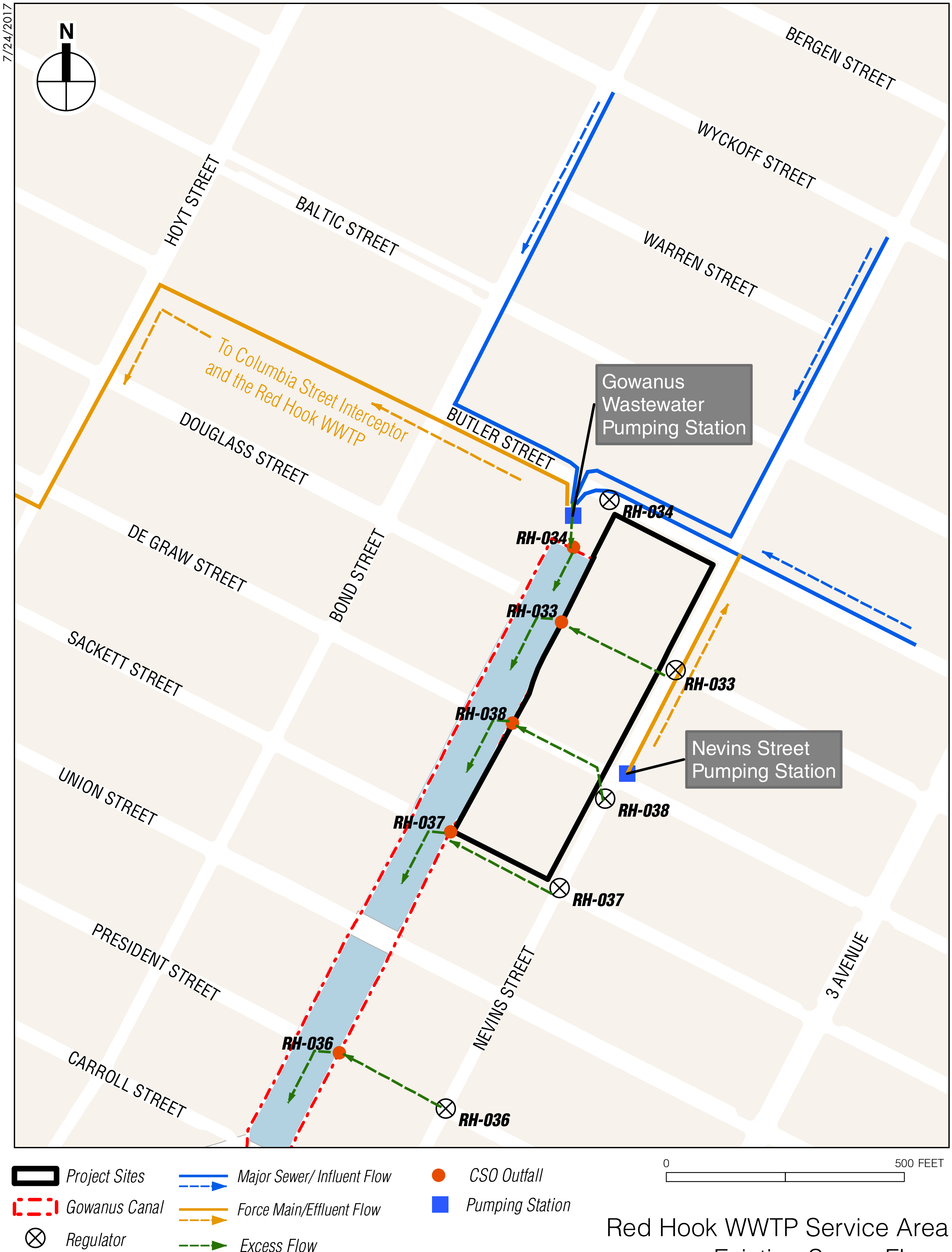
* Sewershed areas indicate the portions of the Gowanus Canal Watershed served by each WWTP

0 1,000 FEET

Gowanus Canal CSO Facilities

CSO and Stormwater Outfall Locations Along the Gowanus Canal

Figure 1-7



Gowanus Canal CSO Facilities

Red Hook WWTP Service Area
Existing Sewer Flows
Figure 1-8

The Gowanus Wastewater Pumping Station and outfall RH-034 primarily receive flows from three major sewers serving neighborhoods north of the Canal. The capacity of the pumping station is 30 MGD. All dry weather and wet weather flow up to 30 MGD is discharged from the pumping station directly to the Columbia Street interceptor sewer via an existing force main. Peak wet weather flows that exceed the capacity of the pumping station are screened and discharged over a weir, which is a structure that regulates flow, to the Canal through outfall RH-034. Tide gates on the RH-034 outfall prevent water in the Canal from backing up into the sewer system.

Four neighboring outfalls (RH-033, RH-036, RH-037, and RH-038) are located near RH-034 along the northeast bank of the Canal. These outfalls receive flows from a separate portion of the combined sewer system that is served by the Nevins Street Pumping Station. Local sewers connect to a sewer located along Nevins Street, which directs flows to the Nevins Street Pumping Station. The Nevins Street Pumping Station sends the collected flow to the interceptor upstream of the RH-034 regulator that leads to the Gowanus Pumping Station. Flows in excess of the Nevins Street Pumping Station's capacity (2 MGD) are directed by regulators along the Nevins Street sewer to the four outfalls, where they are discharged.

OWLS HEAD WWTP SERVICE AREA

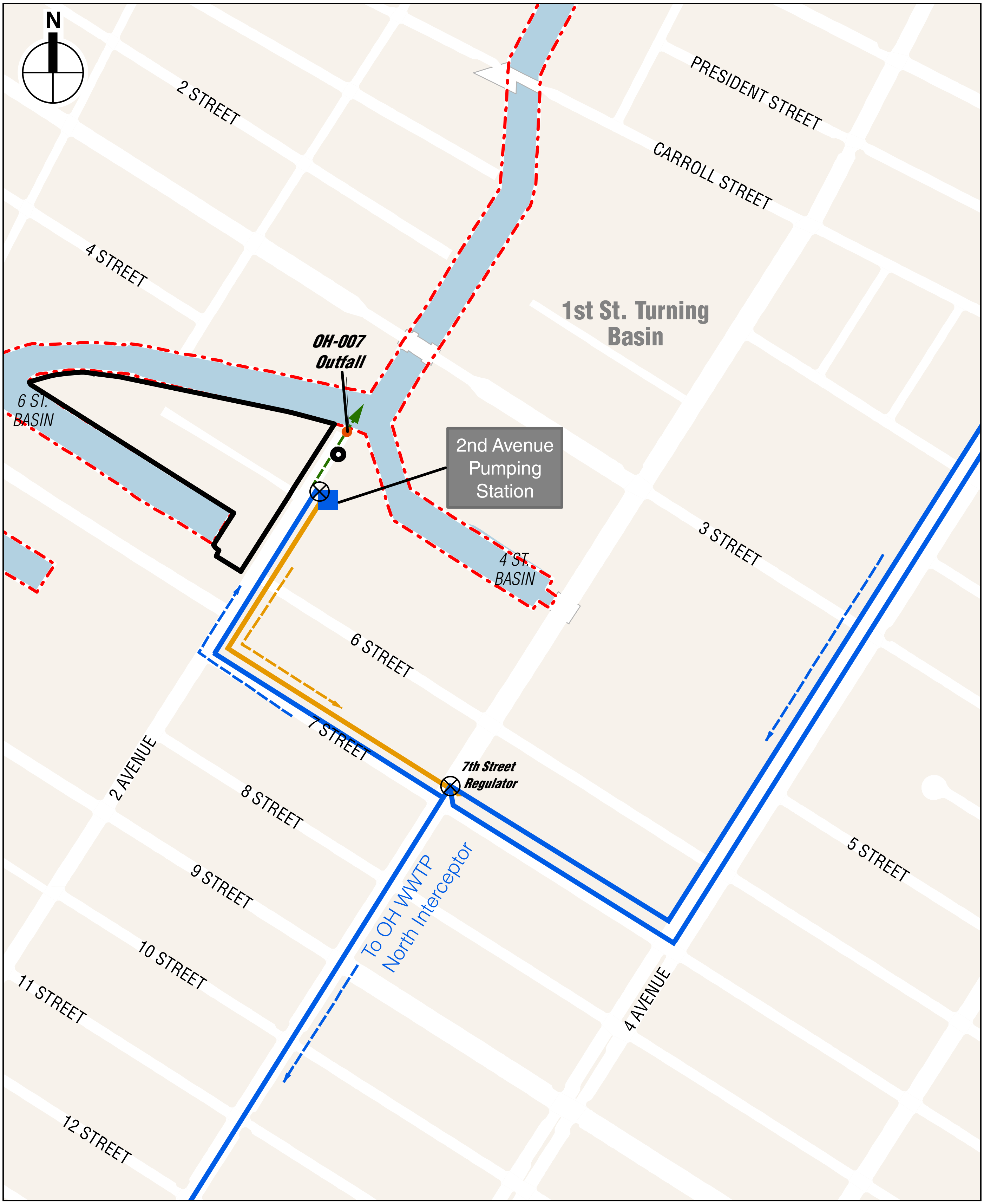
The OH WWTP's service area is located in the western section of Brooklyn. As shown on **Figure 1-1**, the portion of the Canal's sewershed within the OH WWTP's service area is located to the east of the Canal. Flow from this area is directed to the OH WWTP for treatment. During certain wet weather events, up to five CSO outfalls discharge to the Canal from the OH service area (see **Figure 1-7**). Outfall OH-007 discharges the greatest amount of combined sewer flow, as measured by typical year activation frequency and overflow volume. OH-007 is located on the west side of the waterway and discharges just below the 4th Street turning basin.

The OH-007 outfall receives flow from two major sewers, which run parallel to each other along 4th Avenue, between 7th Street and Carroll Street (see **Figure 1-9**). The two sewer lines flow by gravity and combine at 7th Street into a combined sewer that extends southward to the North Interceptor. Two weirs are associated with OH-007. The first weir is located at the upstream (north) end of the combined sewer at 7th Street and 3rd Avenue. This weir diverts excess flow to a relief pipe and the OH-007 outfall. The second weir is located at the downstream end of the relief pipe at the OH-007 outfall. The 2nd Avenue Pumping Station is also on the relief pipe. The pumping station pumps a small amount of flow back to the combined sewer, and excess flow discharges via the second weir to a grit chamber (a structure that collects and removes materials such as silt, sand, and gravel) and then to the Canal. A tide gate on the OH-007 outfall prevents water in the Canal from backing up into the sewer system.

There are eight additional outfalls that are connected to the same sewer network as OH-007 in the OH WWTP's service area. Four of these outfalls discharge to the Canal; three outfalls (OH-006, OH-024, and OH-026) are located downstream of OH-007; one outfall (OH-005) is located upstream of OH-007. The remaining four additional outfalls (OH-023, OH-002, OH-003, and OH-004) in the OH WWTP's service area discharge to the Gowanus Bay and Upper New York Bay (see **Figure 1-7**).

E. DESCRIPTION OF THE PROJECT

The Gowanus Canal CSO Facilities are being designed to collect and retain combined sewer overflow from their respective combined sewer systems, which currently discharge to the Canal. The combined sewer overflow that would be retained in each facility would be pumped to the respective treatment plants after a wet weather event for treatment.



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Project Site	Major Sewer/ Influent Flow	CSO Outfall
Gowanus Canal	Force Main/Effluent Flow	Pumping Station
Regulator	Excess Flow	Grit Chamber

0 500 FEET

Owls Head WWTP Service Area
Existing Sewer Flows

Figure 1-9

Gowanus Canal CSO Facilities

CSO FACILITY OPERATION

During certain wet weather events, influent flow would be conveyed to the CSO Facilities by gravity, first entering an influent channel and passing through a screening system prior to entering the storage tank (see **Figure 1-10**). These screens would remove large debris and protect downstream processes and equipment. The collected debris would be carried via a conveyor belt system to a roll-off container at ground level for direct removal by trucks following the wet weather event. After passing through the screening system, the flow would be held in the storage tanks until there is sufficient downstream capacity to convey the stored flow to the Red Hook or Owls Head WWTP.

The CSO Facilities would be designed with the flexibility to operate for either sequential filling or parallel filling of the storage tanks, and would be accessible to workers to perform cleaning and maintenance through a series of access hatches on the tank surface. With sequential filling, influent flows would most frequently fill the first storage cell during wet weather events. To fill sequentially, gates from the common influent channel or the wet well to the storage cells would be closed except for the gates to the first storage cell; flow would then continue through the first storage cell before spilling over weirs to the next, subsequent storage cell. Any storage cell could be isolated from the influent channel by closing the influent gates and placing stop logs (long, rectangular beams placed on top of each other to control the flowrate into the storage cell) on the weirs on either side of the isolated storage cell, thereby allowing the remaining storage cells to continue to fill in parallel mode. The Facilities would normally operate by sequential filling, which decreases the need for maintenance of the whole facility since only the screening area and the minimum number of cells would need to be cleaned after a wet weather event and avoids the need to take the whole facility offline. Conversely, the Facilities could be configured to fill in parallel by opening the gates from the common influent channel or the wet well and allowing flow to fill each storage cell simultaneously.

Once there is sufficient capacity in the sewer system and at the WWTP, the stored flow would be pumped from the storage tanks and as the tanks are emptied, accumulated solids in the storage cells would be flushed out. The flushing system would use influent water, stored in a separate ~~grid/~~pump back wet well, as the flush water. Flows from the pump back system would then pass through a degritting system, consisting of a combination cyclone/classifier system to remove materials such as silt, sand, and gravels (commonly referred to as “grit”). The grit would be removed via the cyclones and cleaned via service water (water originating from the potable water supply or clarified CSO) and would be discharged directly to the same roll-off container that receives discharges from the screening system. Flow that passes through the degritting system would then be ~~pumped back~~ conveyed to the sewer system. The pump-back system would be sized to return the full contents of the storage tanks (i.e., 8-MG at the Head End Facility and 4-MG at the Owls Head Facility) within 24 hours following a wet weather event to reduce the potential for odors and to allow the storage tanks to receive additional flow.

HEAD END FACILITY

Influent wet weather flows would be directed to the Head End Facility and captured in an approximately 52,000-square-foot (sf) below-grade structure containing the 8-MG tank and tank system (see **Figure 1-11**). In order to divert the flow from the RH-034 outfall to the Head End Facility, modifications would be made to the existing RH-034 regulator structure, including the installation of new bending weirs and replacement of the tide gates. Routing of additional sewer system flows to the Head End Facility, including wet weather flows from adjacent outfalls (RH-033, RH-037, RH-038, and RH-036), would be accomplished by constructing a new sewer on Nevins Street from the intersection with Sackett Street to the intersection with Butler Street (see **Figure 1-12**). In addition, the associated CSO regulators for these outfalls, located in Nevins Street, would be completely upgraded. Outfalls RH-037 and RH-036, together

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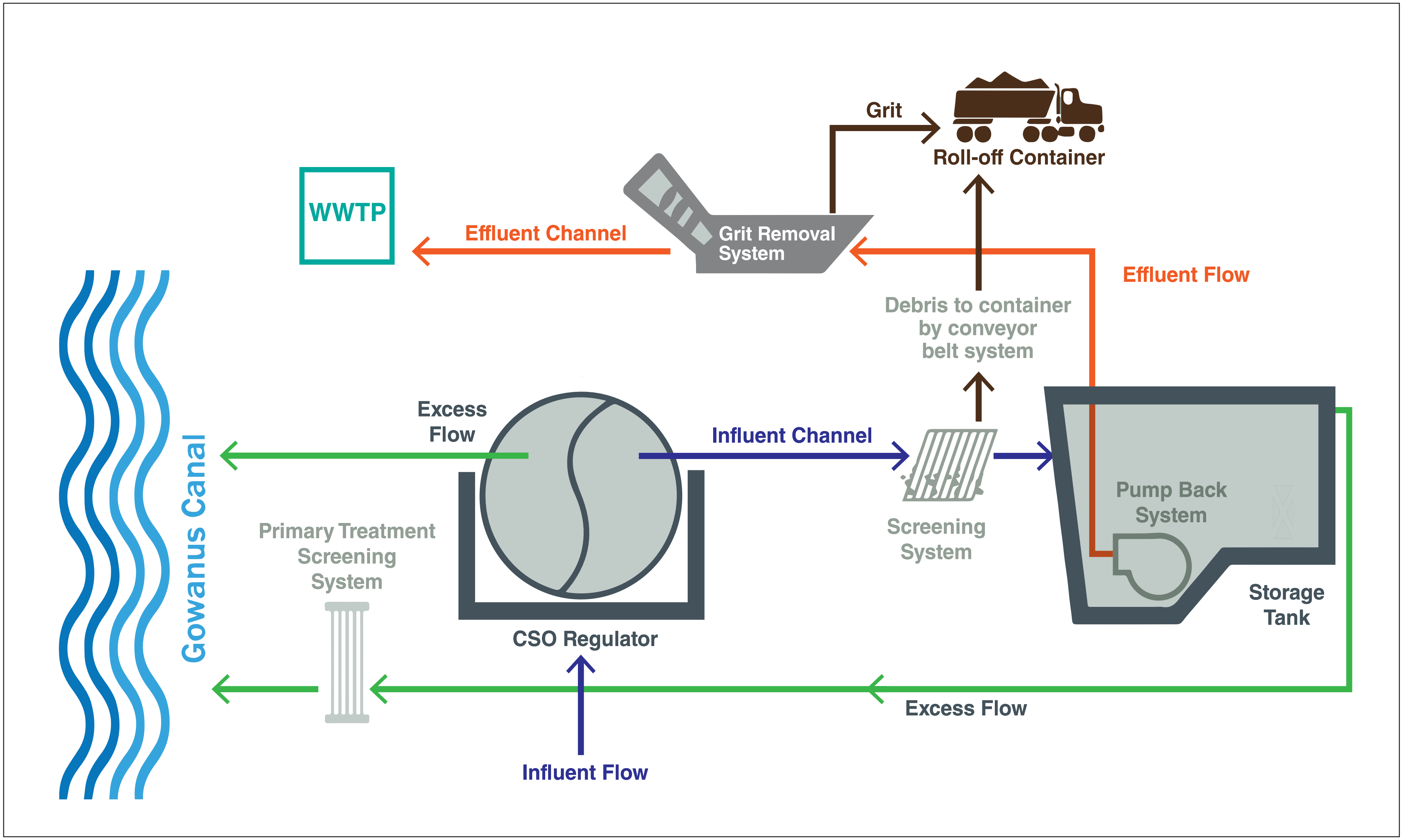
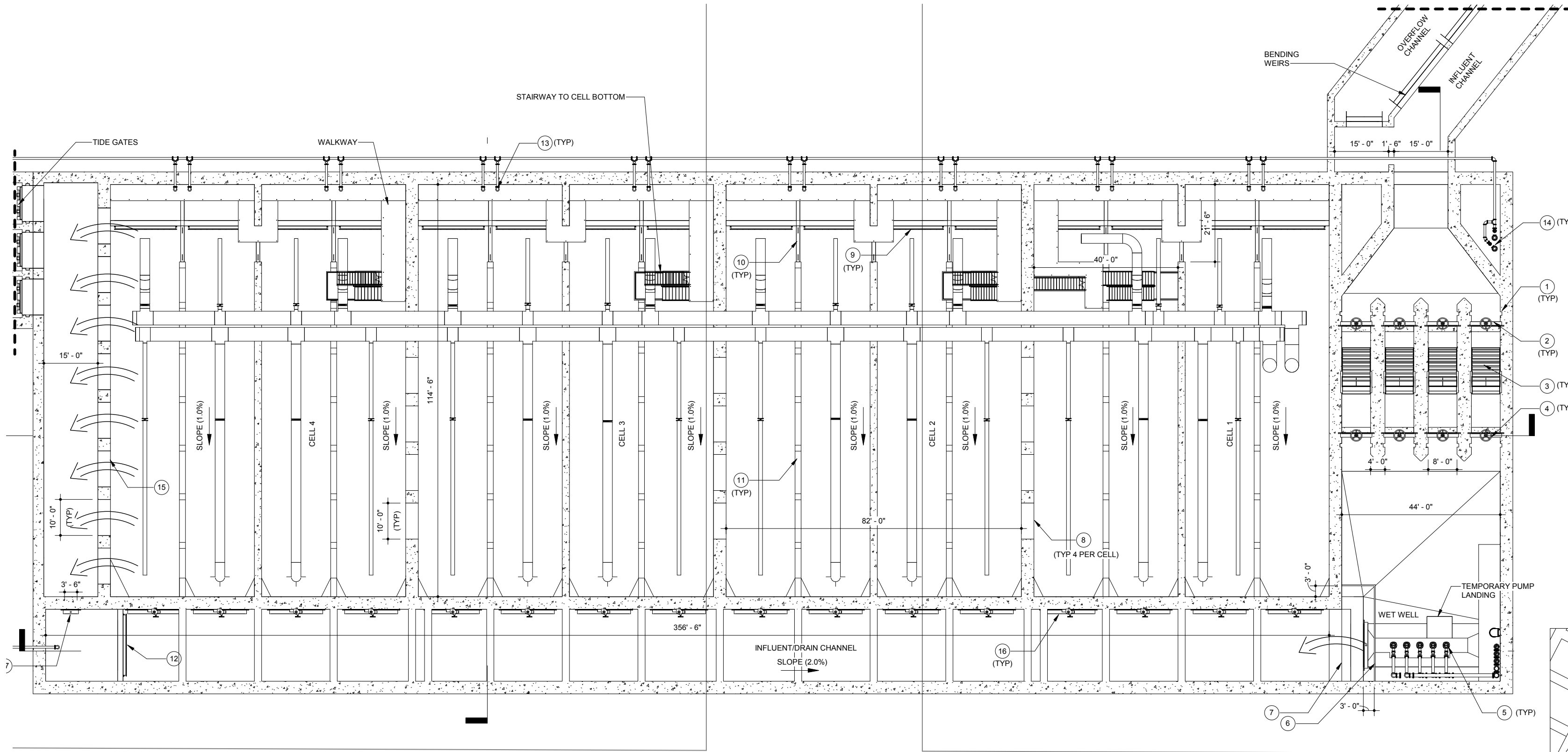


- *Influent Flow*
- *Effluent Flow*
- *Excess Flow*
- *Grit/ Debris*

Gowanus Canal CSO Facilities

CSO Facility Process Flow Diagram
Figure 1-10



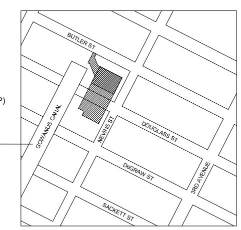
#	KEY NOTES
1	STOP LOG GROOVES
2	SCREEN INLET GATE
3	1/2" DUTY SCREEN
4	SCREEN OUTLET GATE
5	PUMP BACK PUMP AND 10" CONNECTION TO DEGRITTING SYSTEM
6	FLOATABLES BAFFLE
7	STORAGE INLET
8	INTERCELL OVERFLOW WEIR
9	FLUSH GATE
10	REMOVABLE STOP LOG DIVIDER CURB
11	FLUSH LANE DIVIDER CURB
12	INFLUENT CHANNEL FLUSH GATE
13	CELL FLUSHING SUPPLEMENTARY FILL PIPE WITH CONTROL VALVES
14	NON-POTABLE SERVICE WATER RESERVOIR AND PUMP STATION
15	EFFLUENT WEIR EL. -0.30
16	ISOLATION GATE
17	EFFLUENT CHANNEL DRAIN GATE

LEGEND:

- FLOW OVER WEIR
- FLOW DIRECTION
- PROPERTY LINE

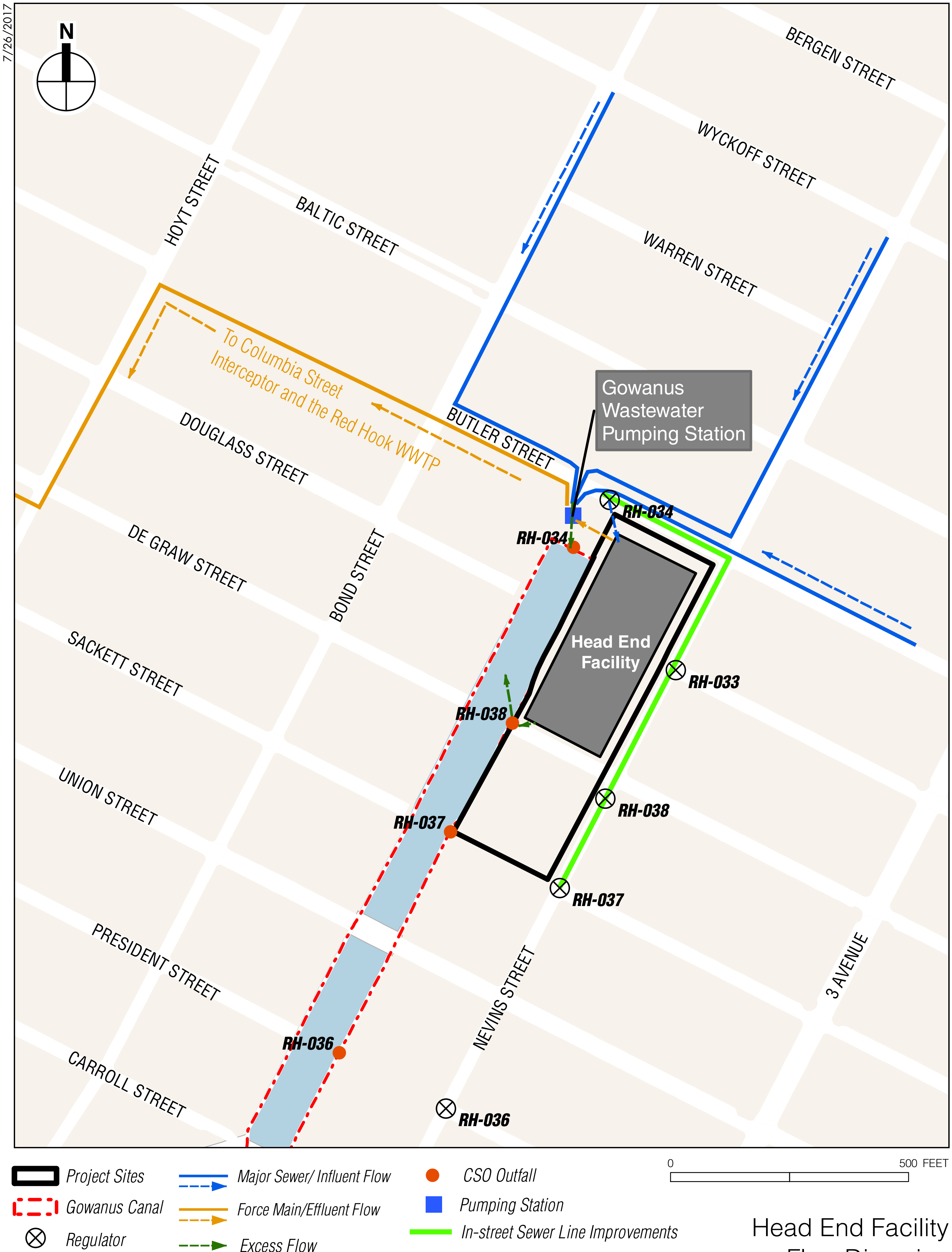
GENERAL NOTES:

1. ELEVATIONS ARE LISTED IN FEET, NAVD88.
2. NAVD88 = BROOKLYN HIGHWAY DATUM + 1.447 FEET.



KEY PLAN

Head End Facility
Below Grade Structure



Gowanus Canal CSO Facilities

Head End Facility
Flow Diversion
Figure 1-12

with outfall RH-034 would remain open and would still be used during high intensity rainfall events. Outfall RH-033, which is located on the Head End Site, would be closed. The Nevins Street Pumping Station and force main would be eliminated and the outfall pipe for the RH-038 outfall (on Degraw Street, between the intersection with Nevins Street and the Canal) would be replaced. Flow from the Head End Facility would be pumped to the Gowanus Wastewater Pumping Station for delivery to the Red Hook WWTP once there is sufficient downstream capacity in the sewer system.

The flow-through design capacity for the Facility is 323 MGD. During wet weather events, if flows to the Facility are within the design capacity of the Facility (i.e., up to 323 MGD), after the 8-MG tank is full (i.e., when flow exceeds the 8-MG capacity of the tank), flow would continue to be directed to the Facility. The excess flows would pass through the Facility and would discharge via effluent weirs to an effluent channel, which receives limited primary treatment via screening and settling. The excess flows would then be discharged to a new conduit in Degraw Street to the RH-038 regulator and outfall and to the Canal. The flow stored in the 8-MG tank would ~~continue to~~ be discharged to the sewer system and to the Red Hook WWTP following the wet weather event. Influent wet weather flows that exceed the 8 MG capacity of the tank are expected to occur less than 20 percent of the typical year storm events at the Head End Facility (approximately six times per year, out of approximately 40 to 50 wet weather events per year). During wet weather events that result in flows exceeding the design capacity of 323 MGD, excess flows would be diverted upstream of the Facility and would discharge via bending weirs to an overflow channel and into the Canal through the existing RH-034 outfall. The CSO volume discharged from outfall RH-034 during a typical year is expected to be reduced by approximately 76 percent, from 137 MG to 33 MG.

In addition to the below grade structure, the Head End Facility would also include an approximately 25,700 sf, two-story above grade structure located at the northern end of the site, with the remainder of the surface area on the site expected to be paved and accessible for maintenance and operations with landscaping and open space where appropriate. The design would include a 50-foot setback from the bulkhead wall, and would provide some form of waterfront publicly accessible open space (see **Figure 1-13**). The surface layout of the Head End Site is currently being designed; the design of additional public access areas and/or public amenities provided on the site will be subject to review by New York City Parks and Recreation (NYC Parks), which includes consultation with the local community.

The above grade structure would house the screening equipment, electrical equipment, an odor control system, ~~an emergency generator,~~ and crew areas.

DEP would provide an odor control system at the Head End Facility to control any potential odors from Facility operations and would utilize activated carbon to adsorb odorous compounds within the Facility before being exhausted to the atmosphere. The odor control system is expected to operate continuously (i.e., 24 hours a day) and would be designed to meet the New York State ambient air quality standard for hydrogen sulfide and the *CEQR Technical Manual* criteria to control both odors and hydrogen sulfide from wastewater processes. ~~An emergency generator, consisting of a 1,100 kilowatt (KW) diesel fired generator, would be provided for critical power needs in the Facility to protect against major blackouts or shutdowns of the utility system. The emergency generator would be designed to meet all applicable federal, state, and local air quality emissions requirements and regulations.~~ All mechanical systems in the Facility would be designed with redundancy measures: in particular, backup measures would be provided to maintain odor control systems during a localized power outage and to maintain operations during maintenance activities. Following publication of the DEIS, the design of the CSO Facilities was refined and now includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. Based on this modification, the design no longer includes emergency generators.

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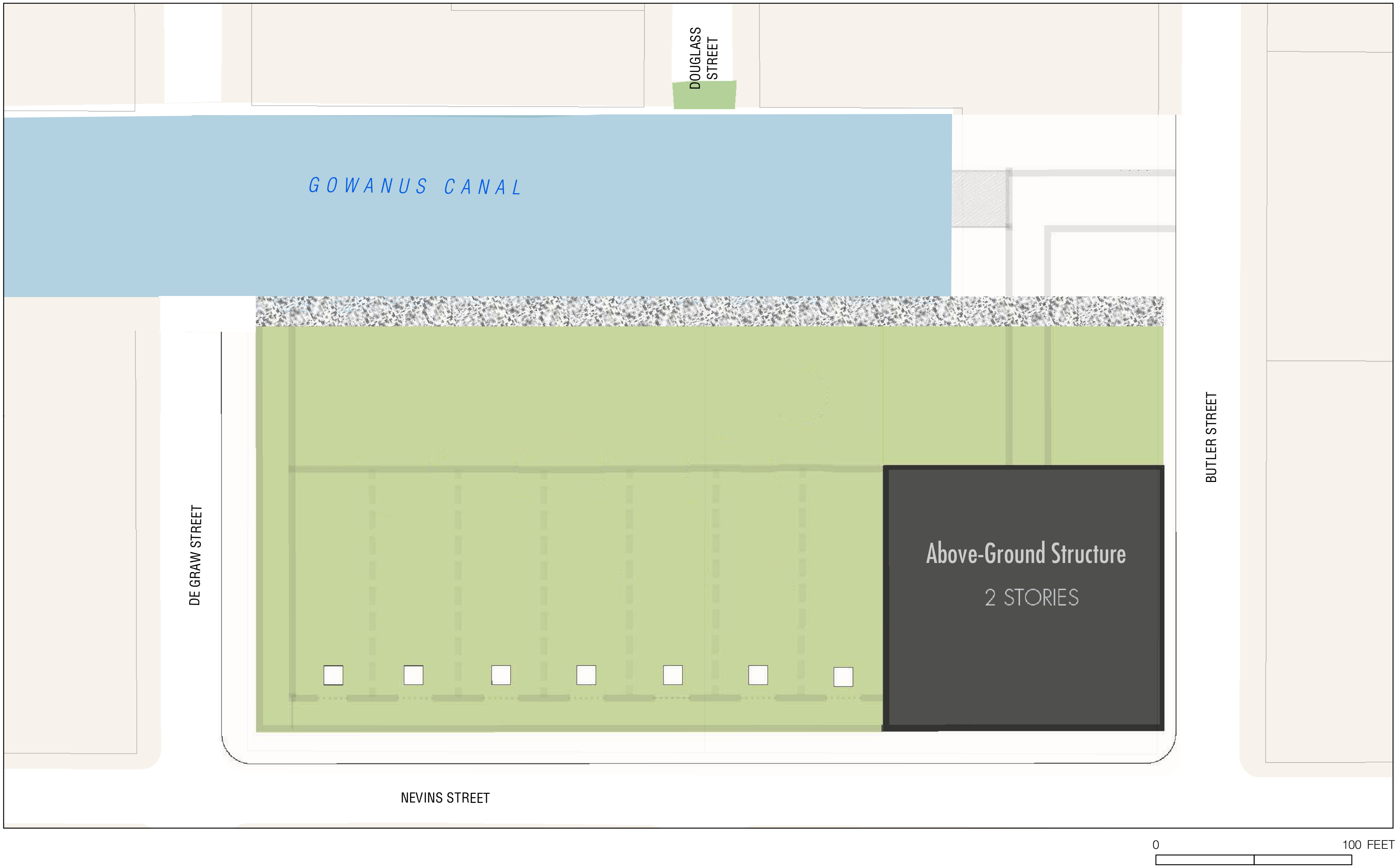

Gowanus Canal CSO Facilities

Head End Facility Site Plan

Figure 1-13

The Head End Facility would be largely automated and would not require permanent staffing. Wet weather events initiating Facility operation are expected to occur approximately 40 to 50 times per year, and overflow events (where excess flows would pass through the Facility and receive primary treatment before being discharged into the Canal) are expected to occur infrequently, approximately six times per year at RH-034. During operation of the Facility, up to two personnel would be on site to monitor and manage equipment operations and perform regular maintenance. Following a wet weather event, typical activities at the Facility would include general housekeeping and inspection, as well as removal of the screenings/grit roll-off container. Following inspection, additional activities such as clearing debris from the tanks or repairs may be performed as needed.

Construction of the Head End Facility would be divided into three construction phases (CP-1, CP-2, and CP-3) to facilitate the sequence of work and the construction activities by others. DEP construction activities at the Head End Facility are expected to take approximately seven years, with additional time expected to be required for site remediation by National Grid.

- CP-1 includes site preparation, utility relocation, and demolition. The construction duration for CP-1 is up to nine months.
- Following demolition, there would be work conducted by others at the Head End Site. In particular, it is expected that National Grid would replace portions of the Canal bulkhead, install the cutoff wall, and excavate and remove MGP related contamination outside the perimeter of the CSO Facility. This construction activity, independent of the Project, is expected to last up to one year.
- CP-2 would begin following the completion of National Grid’s work at the Head End Site, and includes the support of excavation (SOE) construction, site excavation, and construction of the below-grade structures. The construction duration for CP-2 is up to 48 months.
- CP-3 includes the construction of the above grade structures, conveyances, and outfalls, and would have a construction duration of up to 24 months.

OWLS HEAD FACILITY

Wet weather influent flows would be directed to the Owls Head Facility and captured in an approximately 31,000-sf below-grade structure containing the 4-MG tank and tank system (see **Figure 1-14**). In order to capture the total design flow rates required for the Owls Head Facility and to direct the flow to the new Facility, the existing 2nd Avenue regulator, located just north of the 2nd Avenue and 5th Street intersection, would be replaced with a new 2nd Avenue regulator. Other existing sewer infrastructure, including the existing grit chamber, outfall (OH-007, located at the end of 2nd Avenue), and the 2nd Avenue Pumping Station located adjacent to the site, would be demolished and removed. A new outfall and a new, similar pumping station with a 1 MGD capacity would be constructed within the Owls Head Facility. In addition, the existing bulkhead at the Owls Head Facility would be replaced by DEP (see **Figure 1-15**).

Flow from the Owls Head Facility would be ~~pumped~~ conveyed to the Owls Head Interceptor through an existing regulator located at the intersection of 3rd Avenue and 7th Street. A new force main would be constructed to connect the Owls Head Facility to the Owls Head Interceptor for delivery of flow to the Owls Head WWTP once there is sufficient downstream capacity in the sewer system.

The flow-through design capacity for the Owls Head Facility is 146 MGD. During wet weather events, if flows to the Facility are within the design capacity of the facility (i.e., up to 146 MGD), after the 4-MG tank is full (i.e., when flow exceeds the Facility’s 4-MG capacity), flow would continue to be directed to the Facility. The excess flows would pass through the Facility and would discharge via effluent weirs to an effluent channel, which receives limited primary treatment via screening and settling. The excess flows

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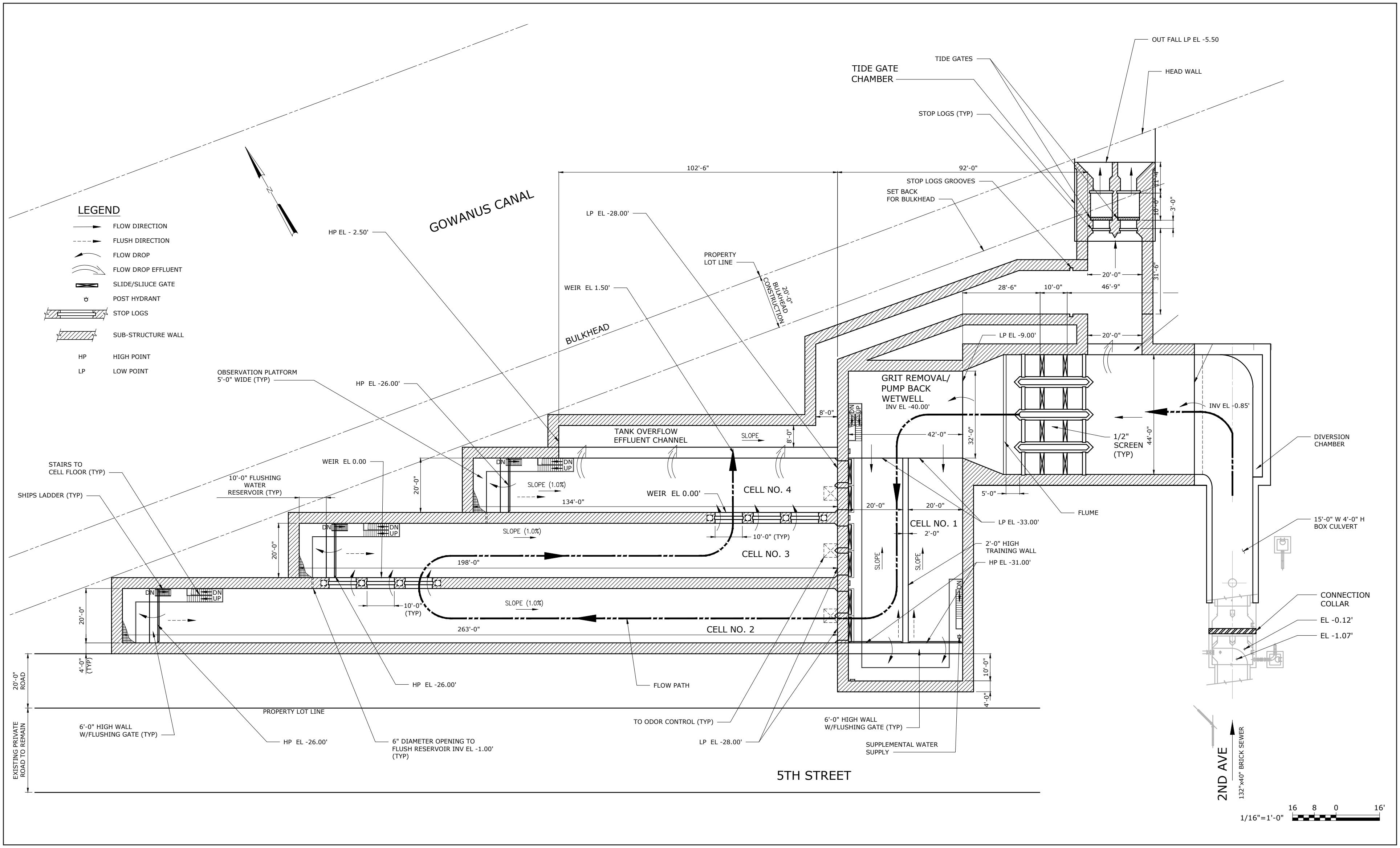

Owls Head Facility
Below Grade Structure

Figure 1-14

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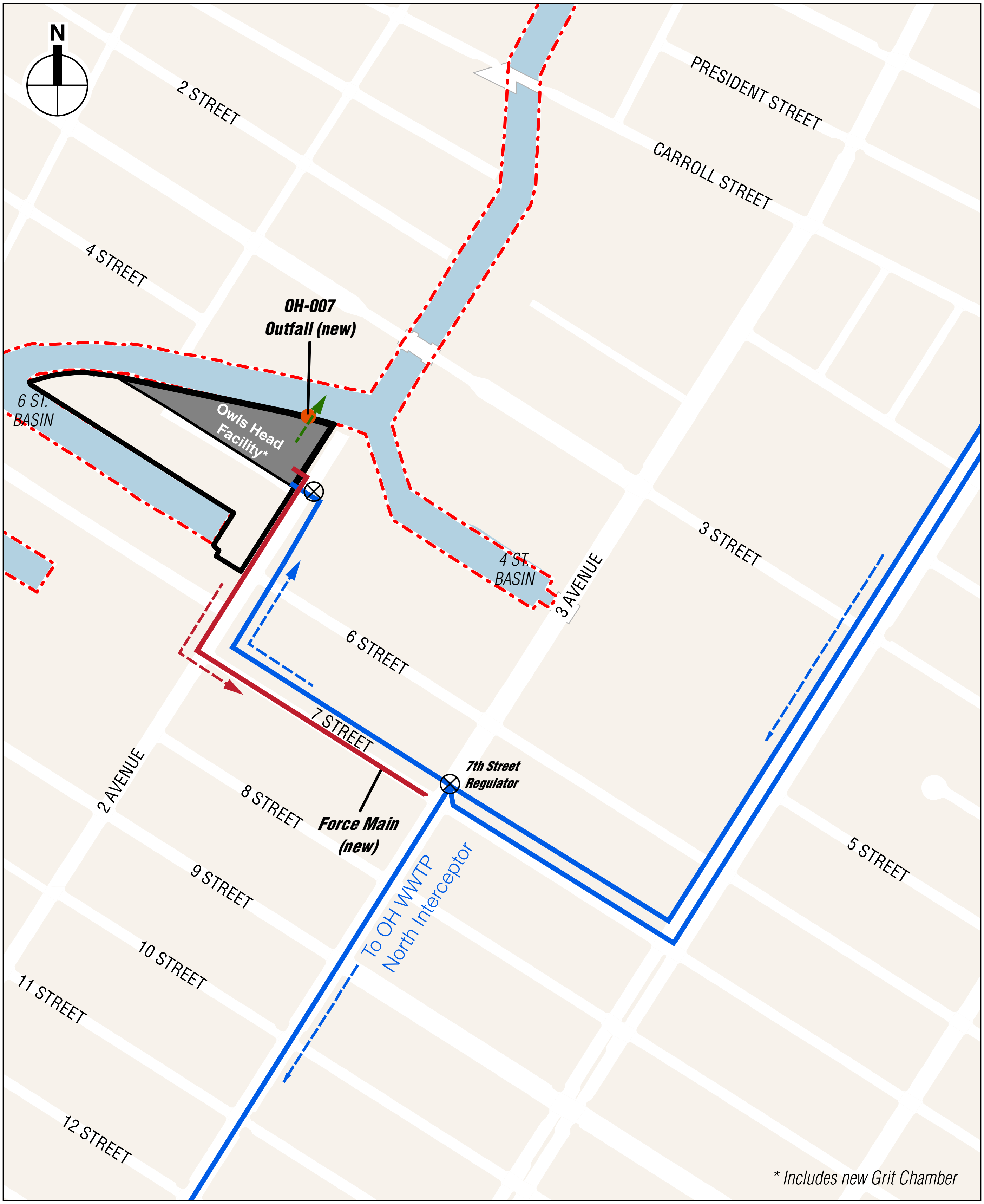

NOT TO SCALE

Project Site
Gowanus Canal
Regulator
New Force Main/ Effluent flow
Major Sewer/ Influent Flow
Excess Flow
CSO Outfall

Gowanus Canal CSO Facilities

Owls Head WWTP Service Area
Future Sewer Flows

Figure 1-15

would then be discharged through the new OH-007 outfall to the Canal. The flow stored in the 4-MG tank would ~~continue to~~ be discharged to the sewer system and to the Owls Head WWTP following the wet weather event. The existing outfall would remain in service during construction and would be closed off once the Owls Head Facility is operational. A tide-gate system would be installed to prevent the Canal from backing up into the tank or the new 2nd Avenue Pumping Station. Influent wet weather flows that exceed the 4-MG capacity of the tank are expected to occur less than 10 percent of the typical year storm events at the Owls Head Facility (approximately five times per year, out of approximately 40 to 50 wet weather events per year). As with the Head End Facility, during wet weather events that result in flows exceeding the Facility's design capacity of 146 MGD, excess flows would be diverted upstream of the Facility and would discharge via a ~~bending~~ weir located in the influent channel directly to the Canal through the new OH-007 outfall. The CSO volume discharged from outfall OH-007 during a typical year is expected to be reduced by approximately 85 percent, from 58 MG to 9 MG.

In addition to the below-grade structure, the Owls Head Facility would also include an approximately 17,600 sf, two-story above grade structure. A portion of the site (Block 977, Lot 3) contains a New York City Department of Sanitation (DSNY) facility that would be incorporated at the Owls Head Facility; the property is also used periodically by a local non-profit environmental group, the Gowanus Canal Conservancy (GCC), for environmental education and stewardship events, including composting operations. The five parcels where the Project would be located would accommodate both the existing DSNY facility and the Owls Head Facility, and is also expected to be accessible for GCC activities following construction of the Owls Head Facility. The remainder of the site is expected to be paved and accessible for maintenance and operations with landscaping where appropriate (see **Figure 1-16**). DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility.

The above-grade structure would house the screening equipment, electrical equipment, and an odor control system~~, an emergency generator, and crew areas~~. As with the Head End Facility, a continuously operating odor control system utilizing activated carbon would be provided at the Owls Head Facility to control any potential odors from Facility operations. ~~An emergency generator, consisting of a 650 KW diesel-fired generator, would be provided for critical power needs in the Facility to protect against major blackouts or shutdowns of the utility system.~~ As with the Head End Facility, all mechanical systems in the Facility would be designed with redundancy measures: in particular, backup measures would be provided to maintain odor control systems during a localized power outage and to maintain operations during maintenance activities. Following publication of the DEIS, the design of the CSO Facilities was refined and now includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. Based on this modification, the design no longer includes emergency generators.

As with Head End Facility, the Owls Head Facility would be largely automated and would not require permanent staffing. The Facility is expected to be in operation approximately 40 to 50 times per year, and overflow events are expected to occur infrequently, approximately five times per year at OH-007. During operation of the CSO Facility up to two personnel would be on site to monitor and manage equipment operations and perform regular maintenance. Following a wet weather event, typical activities would include general housekeeping and inspection, as well as removal of the screenings/grit roll-off container. Following inspection, additional activities such as clearing debris from the tanks or repairs may be performed as needed.

Construction of the Owls Head Facility would be divided into three construction phases (CP-1, CP-2, and CP-3). DEP construction activities at the Owls Head Facility and the potential relocation of the existing DSNY facilities on the Owls Head Site are expected to take approximately seven years.

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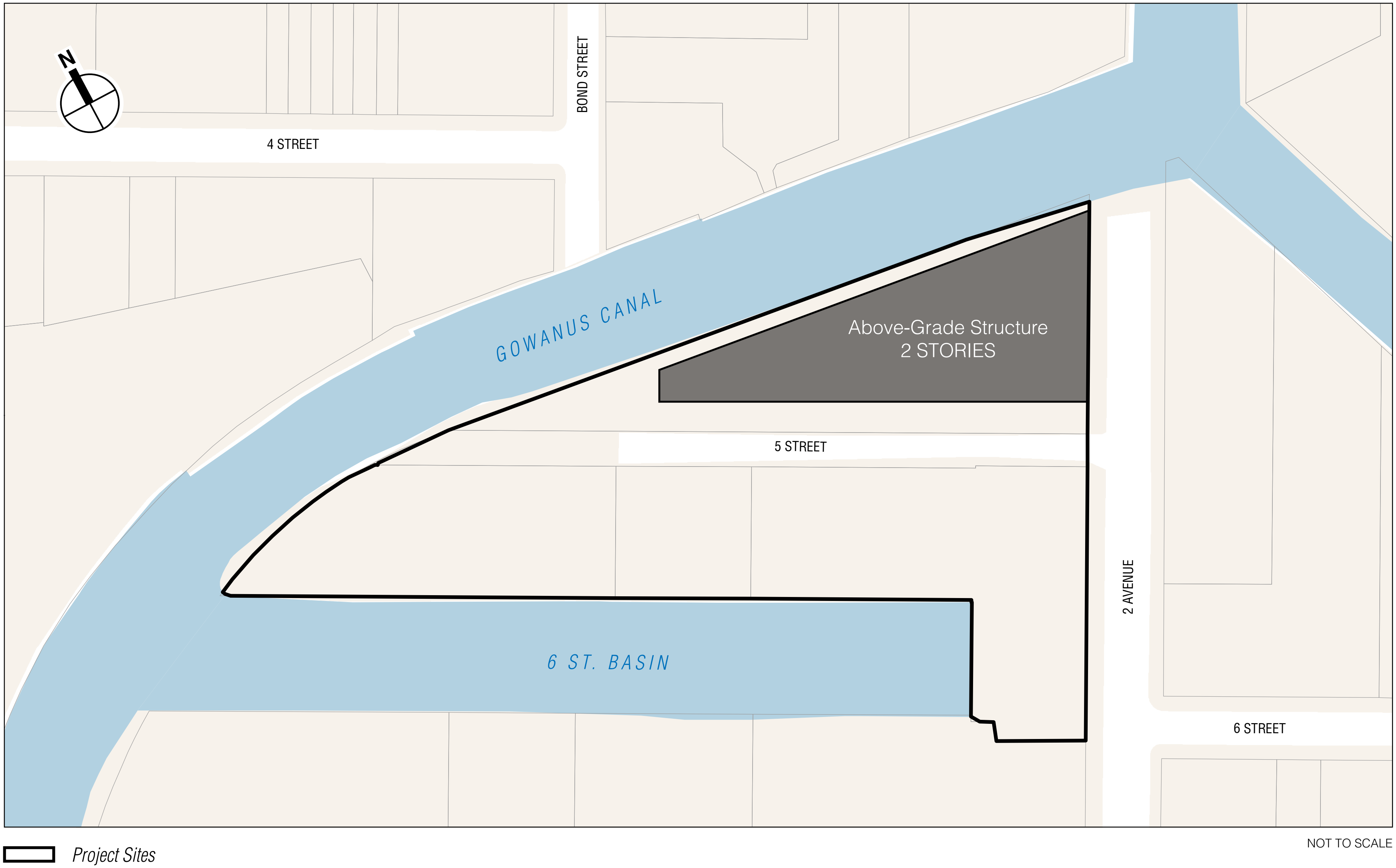


Owls Head Facility Site Plan

Figure 1-16

Gowanus Canal CSO Facilities

- CP-1 includes site preparation, utility relocation, and demolition. The construction duration for CP-1 is up to nine months.
- CP-2 includes the SOE construction, site excavation and construction of the below-grade structures. The construction duration for CP-2 is up to 48 months.
- CP-3 includes the construction of the above grade structures, conveyances, outfalls, and bulkhead improvements and would have a construction duration of up to 24 months.

F. PURPOSE AND NEED

The purpose and need of the Project is to comply with the USEPA ROD requirement to construct the two CSO Facilities described herein. Upland sources of hazardous substances, including discharges from three former MGPs, CSOs, and specified contaminated upland areas and unpermitted pipes along the Canal, must be addressed prior to the commencement of, or in phased coordination with, the implementation of the selected remedy.

To support the construction of the Head End Facility, DEP must acquire two parcels located at 242 Nevins Street and 234 Butler Street (the Head End Canal-side Property) to accommodate the Head End Facility, and lease or acquire one parcel located at 270 Nevins Street to use as a construction staging area (RH-034 Staging Area Property). To support the construction of the Owls Head Facility, DEP must acquire up to four parcels located at 110 Fifth Street, 122 Fifth Street, 22 2nd Avenue, and 5th Street (Owls Head Staging Area Property) adjacent to the Canal.

Although DEP is seeking ULURP approval for site selection and acquisition for both of the sites, DEP will undertake ULURP at different times based on their independent design and construction schedules. For the Head End Facility, in addition to the ULURP approval for site selection and acquisition, DEP will be pursuing a ULURP approval for an amendment to the City Map involving the elimination of Douglass Street between the Canal and Nevins Street. This demapping is not necessary for the project, but reflects that, with the acquisition of the property and the construction of the Head End Facility, the street would not be built and the ULURP for demapping will follow the ULURP for site selection and acquisition. Similarly, for the Owls Head Facility, ULURP would include an amendment to the City Map involving the elimination of 5th Street between 2nd Avenue and the Canal.

G. PROJECT APPROVALS AND COORDINATION

Implementation of the Project would require federal, state and local permits/approvals, or their equivalents under CERCLA. DEP would closely coordinate with USEPA, NYSDEC, New York State Department of State (NYSDOS), New York State Parks, Recreation and Historic Preservation (OPRHP), and New York City agencies as necessary for the Project.

Table 1-1 includes the major permits, approvals, or their equivalents under CERCLA that may be required for the Project.

Table 1-1
Potential Major Permits, Approvals or Equivalants, Consultation, and Coordination[1]—Gowanus Canal CSO Facilities

Agency/Entity	Permit/Approval/Consultation/Coordination
FEDERAL	
U.S. Environmental Protection Agency (USEPA)	CERCLA coordination and consultation
Coastal Zone Management Act	Projects affecting New York's coastal zone must be consistent with the Coastal Zone Management Act, through the New York State Department of State's Coastal Management Program and approved Local Waterfront Revitalization Plans
U.S. Army Corps of Engineers (USACE)	Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act
National Marine Fisheries Service (NMFS)	Consultation with NMFS
United States Fish and Wildlife Service (USFWS)	Consultation under Section 7 of the Endangered Species Act; Biological Assessment; Federal Fish and Wildlife Permit
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act of 1966
STATE	
New York State Department of State (NYSDOS)	Coastal Zone Management Consistency
New York State Department of Environmental Conservation (NYSDEC)	State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity - GP-0-10-001: erosion and sediment control and post-construction stormwater management in accordance with the stormwater pollution prevention plan (SWPPP)
	Individual SPDES Permit or Application Form NY-2C for Industrial Facilities (Dewatering activities requiring discharge to surface water)
	Modification to a SPDES Permit (Individual Permit) for Discharge of Wastewater from Publicly Owned Treatment Works (NY-2A) to remove inactive outfalls
	Tidal Wetlands Permit
	Long Island Well Permit and Approval of Completed Works
	Protection of Waters Permit Navigable Waters (Excavation or Fill)
	Section 401 Water Quality Certification
	Natural Heritage Program Consultation—consultation to determine potential presence of threatened or endangered species listed in New York State
New York State Office of Parks, Recreation and Historic Preservation (OPRHP)	Consultation to determine potential presence of archaeological and/or historic resources and determine project's potential effects
NEW YORK CITY	
New York City Department of City Planning (DCP)	ULURP for site selection, property acquisition, and an amendment to the City Map (street demapping for due diligence – not required to build the Project)
	New York City Waterfront Revitalization Program—Consistency Assessment
New York City Department of Small Business Services (SBS)	Permitting for waterfront construction

Note:
[1] Includes documentation of regulatory compliance under CERCLA through equivalent review by responsible agencies.

H. SCOPE AND METHODOLOGY OF THE ENVIRONMENTAL IMPACT STATEMENT

The purpose of the EIS is to provide a discussion of the potential significant adverse environmental impacts associated with implementation of the Project and to the maximum extent practicable, avoid or mitigate such impacts, consistent with social, economic, and other essential considerations. The 2014 *CEQR Technical Manual* has been used to evaluate the Project's impacts.

Each impact analysis includes an inventory of existing conditions establishing a baseline against which future conditions can be projected (Existing Condition). In addition, each impact analysis includes a determination of future conditions known to occur or expected to occur in the future regardless of the Project (Future Conditions in the Analysis Year or the Future without the Project). Clean-up activities required by USEPA or NYSDEC of other parties, such as the installation of the containment/cutoff wall, the excavation or stabilization of MGP-related contamination on shared parcels, the dredging of the Canal, the restoration of the 1st Street and 4th Street turning basins, and the installation of coal tar extraction wells, are presented as part of the Future Conditions in the Analysis Year. Finally, each impact analysis includes an analysis of the Project's likely effects on its environmental setting (Probable Impacts of the Project) in the expected year of completion (Analysis year). The Project's expected year of completion is 2028.

The EIS contains:

- A description of the Project and the environmental setting;
- A description of the methodologies utilized for each technical area;
- A statement of the potential significant adverse environmental impacts of the Project;
- An identification of any potential significant adverse impacts that cannot be avoided if the Project is implemented;
- An identification of irreversible and irretrievable commitments of resources that would be involved if the Project is built; and
- A description of measures proposed to minimize or fully mitigate any potential significant adverse environmental impacts.

The methodologies utilized for each analysis are presented in each technical area's respective chapter. Where applicable, the EIS presents a comparative analysis of feasible alternatives in order to examine reasonable and feasible options that avoid or reduce project-related significant adverse impacts while still achieving the stated goals and objectives of the Project. In most cases, a No Action Alternative (i.e., examining the impacts of not undertaking the action being reviewed) must be included in an EIS. However, since the USEPA ROD requires the City to construct two CSO Facilities, a No Action alternative is not evaluated as part of the EIS.

The EIS, though not considering a No Action Alternative, contains other alternatives analyses. As discussed above, if the land at the Head End Canal-side Property cannot be acquired within the allotted timeframe (per the Settlement Agreement[6]), USEPA may direct that the Head End Facility be constructed at the Thomas Greene Playground, located to the east of the Head End Site across Nevins Street (Block 419, Lot 1). Therefore, the alternatives analysis for the Head End Site considers locating the Facility on a portion of the Thomas Greene Playground.

As the City is not under a USEPA order directing the City to construct the Owls Head Facility at the preferred location, the analysis includes a discussion of an alternative to the City's preferred location. In particular, this section considers the alternative location to the east of the Owls Head Site along 6th Street (Block 979, Lots 18 and 23). This site was identified as a possible alternative to the proposed site in a Siting and Planning Study performed by the City.

The analyses of project alternatives are presented in Chapter 22, "Project Alternatives."

[6] USEPA. "Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery," June 2016, USEPA Region II, New York, NY: p.37.

I. PUBLIC REVIEW PROCESS

UNIFORM LAND USE REVIEW PROCEDURE (ULURP)

The Project requires actions that are subject to the City's ULURP process. As noted above, DEP is seeking ULURP approval for site selection, property acquisition, and street demapping that would be required for the Head End Facility (the street demapping is not required to build the Project and will happen at a later time than the site selection and property acquisition ULURP); the Owls Head Facility would have a separate ULURP for property acquisition, site selection, and street demapping at a later time. The ULURP process, mandated by Sections 197-c and 197-d of the New York City Charter, is designed to allow public review of ULURP applications at four levels: Community Board, Borough President, City Planning Commission (CPC), and City Council. The procedure sets time limits for each level of review to ensure a maximum total review period of approximately seven months.

The process begins with certification by the Department of City Planning that the ULURP application is complete. The application is then referred to the relevant Community Board (in this case Brooklyn Community Board 6). The Community Board has up to 60 days to review and discuss the proposal, hold a public hearing, and adopt an advisory resolution on the ULURP application. The Borough President then has up to 30 days to review the application. CPC then has up to 60 days, during which time a public hearing is held on the ULURP application. If CPC approves the application it is forwarded to the City Council, which has 20 days to decide whether to review the proposed ULURP actions. When an approval is "called-up" by the Council, within 50 days of receipt of the CPC report the Council must hold a public hearing, and approve, approve with modifications or disapprove CPC's decision.

NEW YORK CITY ENVIRONMENTAL QUALITY REVIEW (CEQR)

Pursuant to SEQRA and its implementing regulations, New York City has established rules for its own environmental review process known as CEQR. The CEQR process provides a means for decision-makers to systematically consider environmental effects along with other aspects of project planning and design, to evaluate reasonable alternatives, and to identify, and when practicable mitigate, significant adverse environmental impacts. CEQR rules guide environmental review through the following steps:

- **Establish a Lead Agency**. Under CEQR, the "lead agency" is the public entity responsible for conducting the environmental review. The lead agency is typically the entity principally responsible for carrying out, funding, or approving the proposed action. For the Project, DEP is the lead agency.
- **Determine Significance**. The lead agency's first charge is to determine whether the Project may have a significant impact on the environment. To make this determination, the lead agency prepared an Environmental Assessment Statement (EAS). Based on the information contained in the EAS, the lead agency determined that the Project could have the potential to result in significant adverse environmental impacts and issued a Positive Declaration on March 31, 2017.
- **Scoping**. Once the lead agency issues a Positive Declaration, it must then issue a draft scope of work for the EIS. "Scoping," or creating the scope of work, is the process of establishing the type and extent of the environmental impact analyses to be studied in the EIS. Along with a Positive Declaration, the Draft Scope of Work was also issued on March 31, 2017. A public scoping meeting was held on May 4, 2017, at P.S. 32, 317 Hoyt Street, Brooklyn, NY 11231. The period for submitting written comments remained open until June 16, 2017. A Final Scope of Work, taking into consideration comments received during the public comment period, was issued on September 14, 2017.

- **Draft Environmental Impact Statement (DEIS)**. In accordance with the final scope of work, a DEIS is prepared. The lead agency reviews all aspects of the document, calling on other City agencies to participate as appropriate. Once the lead agency is satisfied that the DEIS is complete, it issues a Notice of Completion and circulates the DEIS for public review. When a DEIS is required, it must be deemed complete before the ULURP application can be certified as complete. The DEIS was deemed complete, and the Notice of Completion was issued on September 14, 2017.
- **Public Review**. Publication of the DEIS and issuance of the Notice of Completion signals the start of the public review period. During this period, which must extend for a minimum of 30 days, the public may review and comment on the DEIS either in writing or at a public hearing convened for the purpose of receiving such comments. When the CEQR process is coordinated with another City process that requires a public hearing, such as ULURP, the hearings may be held jointly. The lead agency must publish a notice of the hearing at least 14 days before it takes place and must accept written comments for at least 10 days following the close of the hearing. All substantive comments become part of the CEQR record and are summarized and responded to in the Final Environmental Impact Statement (FEIS). The joint public hearing on the DEIS and the ULURP was held on January 17, 2018 in Spector Hall at 22 Reade Street, New York, NY 10007. The period for submitting written comments remained open until January 29, 2018.
- **Final Environmental Impact Statement (FEIS)**. After the close of the public comment period for the DEIS, the lead agency prepares the FEIS. The FEIS incorporates relevant comments on the DEIS (in a separate chapter), and changes to the body of the text, graphics, and tables. Once the lead agency determines that the FEIS is complete, it will issue a Notice of Completion and circulate the FEIS.
- **Findings**. To demonstrate that the responsible public decision-maker has taken a hard look at the environmental consequences of a project, any agency taking a discretionary action regarding a project must adopt a formal set of written findings, reflecting its conclusions about the significant adverse environmental impacts of the project, potential alternatives, and potential mitigation measures. The findings may not be adopted until 10 days after the Notice of Completion (pursuant to CEQR) has been issued for the FEIS. Once an agency adopts findings, the agency may take its actions. ✷

Chapter 2: Land Use, Zoning, and Public Policy

A. INTRODUCTION

A land use, zoning, and public policy analysis evaluates the uses and development trends in an area that may be affected by a project and determines whether that project is compatible with those conditions or may affect them. This chapter considers the Project's consistency with the uses in the area around the Gowanus Canal (the Canal) and the Project's compliance with, and potential effect on, the area's zoning and other applicable public policies, including the City's Waterfront Revitalization Program (WRP).

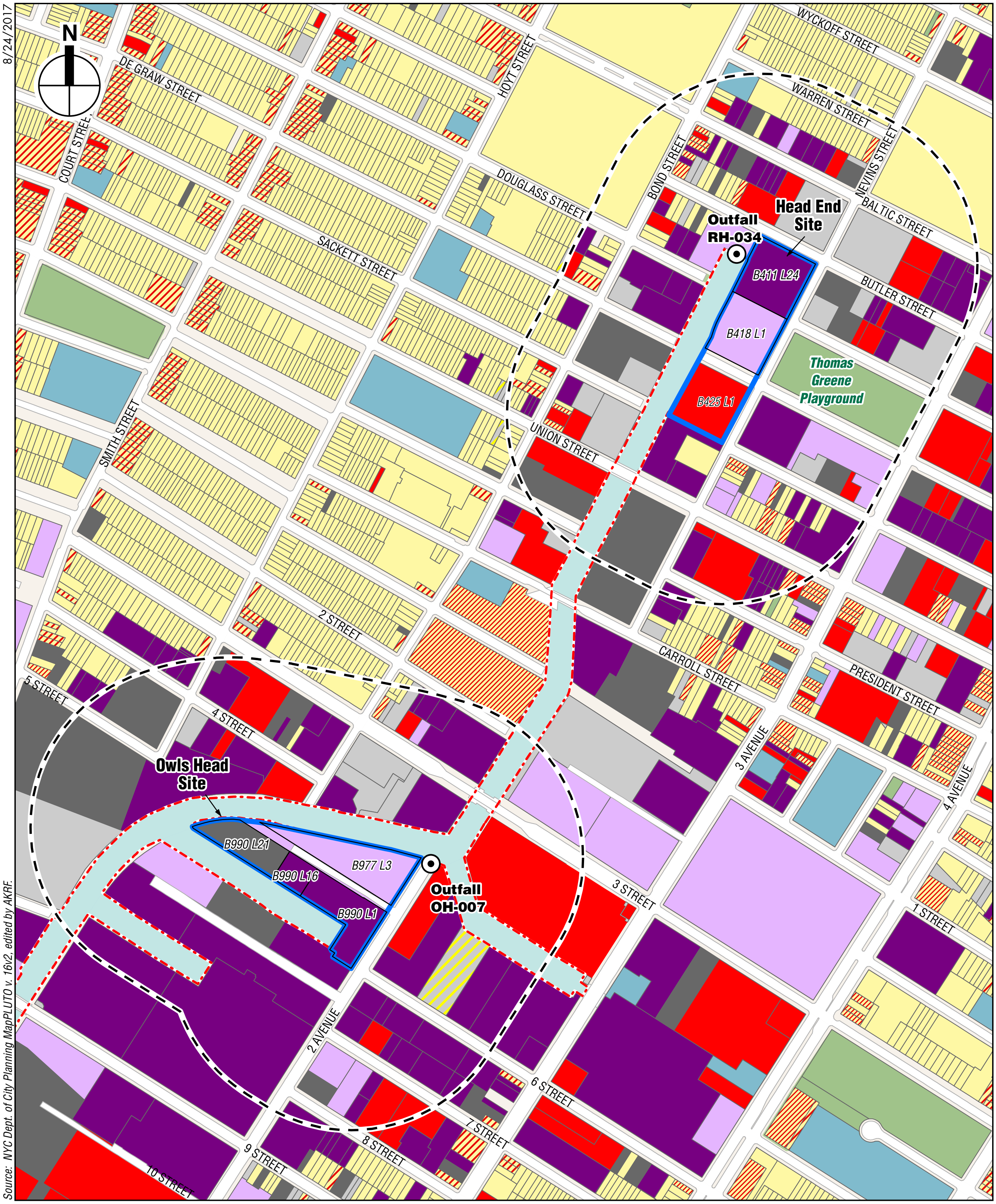
B. METHODOLOGY

The 2014 *City Environmental Quality Review* (*CEQR) Technical Manual* indicates that a land use, zoning, and public policy assessment should be provided for all projects that would affect land use, zoning, or public policy, regardless of the project's anticipated effects. Accordingly, an analysis has been prepared that describes the existing land uses in the area of the Project, as well as the current zoning regulations applicable to the Project site and the surrounding area, and any relevant public policies. The analysis also describes anticipated future conditions for the 2028 analysis year, including anticipated changes in land uses and any anticipated modifications to zoning regulations and public policies. The analysis considers any changes to land use that would occur as a result of the Project and identifies those changes, if any, that could be adverse, such as a use that is incompatible with other uses in the surrounding area. The analysis also describes any changes to zoning regulations and/or public policies that would occur as a result of the Project, and assesses the Project's compatibility with those regulations and policies. In particular, the analysis provides an assessment of the Project's consistency with the City's coastal policies in the WRP.

The study areas for the land use, zoning, and public policy analysis encompass the two areas within an approximately 600-foot radius of the Head End Site and the Owls Head Site, and include those communities and uses that could potentially be affected by the Project. As shown on **Figure 2-1**, the 600-foot study area for the Head End Site (the Head End Study Area) generally extends from Warren Street to the north, 3rd Avenue to the east, Carroll Street to the south, and the area along the west side of Bond Street (west of the Canal) to the west. The 600-foot study area for the Owls Head Site (the Owls Head Study Area) generally extends from 2nd Street to the north, 3rd Avenue to the east, 9th Street to the south, and between Hoyt and Smith Streets to the west.

As described in more detail in Chapter 1, "Project Description," the New York City Department of City Planning (DCP) is currently undertaking the Gowanus PLACES Neighborhood Planning Study in the area of the Project. Since the neighborhood study is still in its preliminary stages and no changes to zoning or land use are proposed or known at this time, this EIS and relevant analysis chapters assume that existing zoning regulations and associated current land use patterns and development trends applicable to the Head End Site, the Owls Head Site, and the study areas remain in place in the 2028 analysis year. Additionally, as discussed further below, for the purposes of a conservative analysis, in the Future Conditions in the Analysis Year, two projects within the study areas were included as planned projects expected to be complete by the 2028 analysis year: 239 Butler Street and 148 3rd Street.

8/24/2017



Source: NYC Dept. of City Planning MapPLUTO v. 16v2, edited by AKRF.

Project Sites
Study Areas (600-foot boundaries)
Gowanus Canal
Commercial and Office Buildings
Hotels
Industrial and Manufacturing
Open Space and Outdoor Recreation
Parking Facilities
Public Facilities and Institutions
Residential
Residential with Commercial Below
Transportation and Utility
Vacant Land
Vacant Building
Under Construction
Outfall Locations

0 400 FEET

Gowanus Canal CSO Facilities

Existing Land Use

Figure 2-1

Sources used for this analysis included field reconnaissance, public reports issued by DCP and other City agencies, and online databases provided by DCP and the New York City Department of Buildings (DOB).

C. EXISTING CONDITIONS

LAND USE

PROJECT SITES

Head End Site

The Head End Site includes three properties totaling approximately 3.6 acres (see **Figure 2-2a**). Two of the properties are on the eastern side of the Canal between Degraw and Butler Streets (Block 411, Lot 24 and Block 418, Lot 1). The Head End Facility would be constructed on these two properties, which are currently developed with several one- and two-story buildings used by semi-industrial and auto-related businesses, including automobile repair shops and electrical and plumbing contractors. These buildings are generally located along the street frontages of the properties (along Nevins and Degraw Streets) while the interior of the properties face the Canal and generally contain open vehicle and equipment storage yards (accessed by a driveway on Butler Street and two driveways on Nevins Street). A sewer line runs through the properties leading to a CSO outfall on the Canal (outfall RH-033). This sewer line extends under a mapped but unbuilt portion of Douglass Street.

The third property on the Head End Site is south of Degraw Street (Block 425, Lot 1) and is intended to be used as a construction staging area. This property is developed with a one-story former manufacturing building that has been repurposed into a film production studio.

Owls Head Site

The Owls Head Site includes five properties totaling approximately 4.1 acres (see **Figure 2-2b**) that would be used for construction staging areas and for the Owls Head Facility. One property, which is owned by the New York City Department of Sanitation (DSNY), is located along the southern side of the Canal as it bends toward the west near the 4th Street turning basin (Block 977, Lot 3). The property is primarily a storage yard for road salt and snow plows, and contains a recently constructed shed. The property is also used periodically by a local non-profit environmental group, the Gowanus Canal Conservancy (GCC), for environmental education and stewardship events, including composting operations. South of the DSNY lot, the site consists of four properties: the adjacent property (Block 977, Lot 1) is a portion of 5th Street which leads to a vehicle storage area along the Canal (Block 990, Lot 21); the street is a mapped City street that is controlled by the private owner of the vehicle storage property and used as a private street. The other properties (Block 990, Lots 1 and 16) are located between 5th Street and the 6th Street turning basin, and contain one-story buildings used by automobile repair and shipping businesses.

STUDY AREA

Head End Study Area

The Head End Study Area primarily contains commercial, light- or semi-industrial, and residential uses—an increasingly common mix around the Canal and in the surrounding area. In particular, the properties fronting the Canal to the south of the Head End Site and on the western side of the Canal consist mainly of one- to three-story distribution and warehouse buildings, as well as open storage yards and truck/bus parking and artist workspace and studios. The area north of the Head End Site along Baltic and Butler

8/9/2017

Project Site
Study Area (600-foot boundary)
Gowanus Canal

0 400 FEET

Head End Site Existing Condition - Aerial

Gowanus Canal CSO Facilities

Figure 2-2a

8/9/2017

Project Site

Study Area (600-foot boundary)

Gowanus Canal

Owls Head Site Existing Condition - Aerial

Gowanus Canal CSO Facilities

Figure 2-2b

Streets and east of the Head End Site between Nevins Street and 3rd Avenue contains a mix of legal non-conforming residential buildings interspersed with vacant former manufacturing buildings, distribution/warehousing buildings and commercial office space. The Thomas Greene Playground, a public open space (which includes a public pool) operated by the New York City Department of Parks and Recreation (NYC Parks) and one of the few public recreational spaces in the Gowanus neighborhood, is located east of the Head End Site between Douglass and Degraw Streets. A former manufacturing building immediately north of the Head End Site (239 Butler Street) is currently vacant, although it is proposed to undergo renovations to convert it into a hotel (discussed further below under "Future Conditions in the Analysis Year").

Within the Head End Study Area, major sewer infrastructure is located adjacent to the Head End Site. Specifically, the New York City Department of Environmental Protection (DEP) Gowanus Wastewater Pumping Station is located immediately to the west of the Head End Site along Butler Street, and is part of the wastewater conveyance and treatment system connecting to the Red Hook Wastewater Treatment Plant (WWTP). In addition, the Gowanus Canal Flushing Tunnel discharges to the Canal opposite the Head End Site.

Residential uses within the Head End Study Area are generally located to the north of the Head End Site along Warren Street and to the west of the Head End Site along Bond Street; these portions of the Head End Study Area are closer to the primarily residential neighborhoods bordering the Head End Study Area (Carroll Gardens to the west and Boerum Hill to the north), and contain one- and two-family townhouses and walkup apartment buildings. Similar residential buildings are located near the intersection of Bond and Butler Streets west of the Head End Site and near Union and Nevins Streets south of the Head End Site, including a four-story former warehouse building (282 Nevins Street) that has been converted to a multi-family apartment building and artists' lofts under provisions of the New York City Loft Law.[1] Wyckoff Gardens, a multi-building residential complex operated by the New York City Housing Authority (NYCHA), lies within the Head End Study Area north of the Head End Site on Nevins Street. Another NYCHA residential complex, the Gowanus Houses, is located within the Head End Study area west of the Head End Site along Bond Street.

Commercial uses within the Head End Study Area are predominantly local retail facilities, hotels, and entertainment and fitness facilities, and can be found adjacent to the residential buildings along Bond Street, near Union and Nevins Streets, and along Baltic and Butler Streets.

The surrounding neighborhoods of Park Slope, Carroll Gardens, and Boerum Hill were rezoned in 2003, 2009, and 2011, respectively. These rezonings generally established height limits on the side streets that reflect those neighborhoods' prevailing rowhouse character while allowing greater residential density where appropriate. In recent years, mixed-use buildings of up to 12 stories have been constructed on 4th Avenue in the Park Slope neighborhood to the east of the Canal.

Owls Head Study Area

The Owls Head Study Area primarily contains a mix of manufacturing, light-industrial, and commercial uses in one- to three-story buildings located on both sides of the Canal. Industrial uses include concrete

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[1] Through provisions in the New York City Multiple Dwelling Law (MDL), manufacturing or commercial space in buildings located in zoning districts where residential uses are not allowed may be converted to an Interim Multiple Dwelling (IMD), also known as a loft, administered by the New York City Loft Board. Typically these loft conversions are used to legalize non-conforming residential spaces that have already been occupied for an extended period of time and ensure that the space conforms to necessary fire safety and other code requirements.

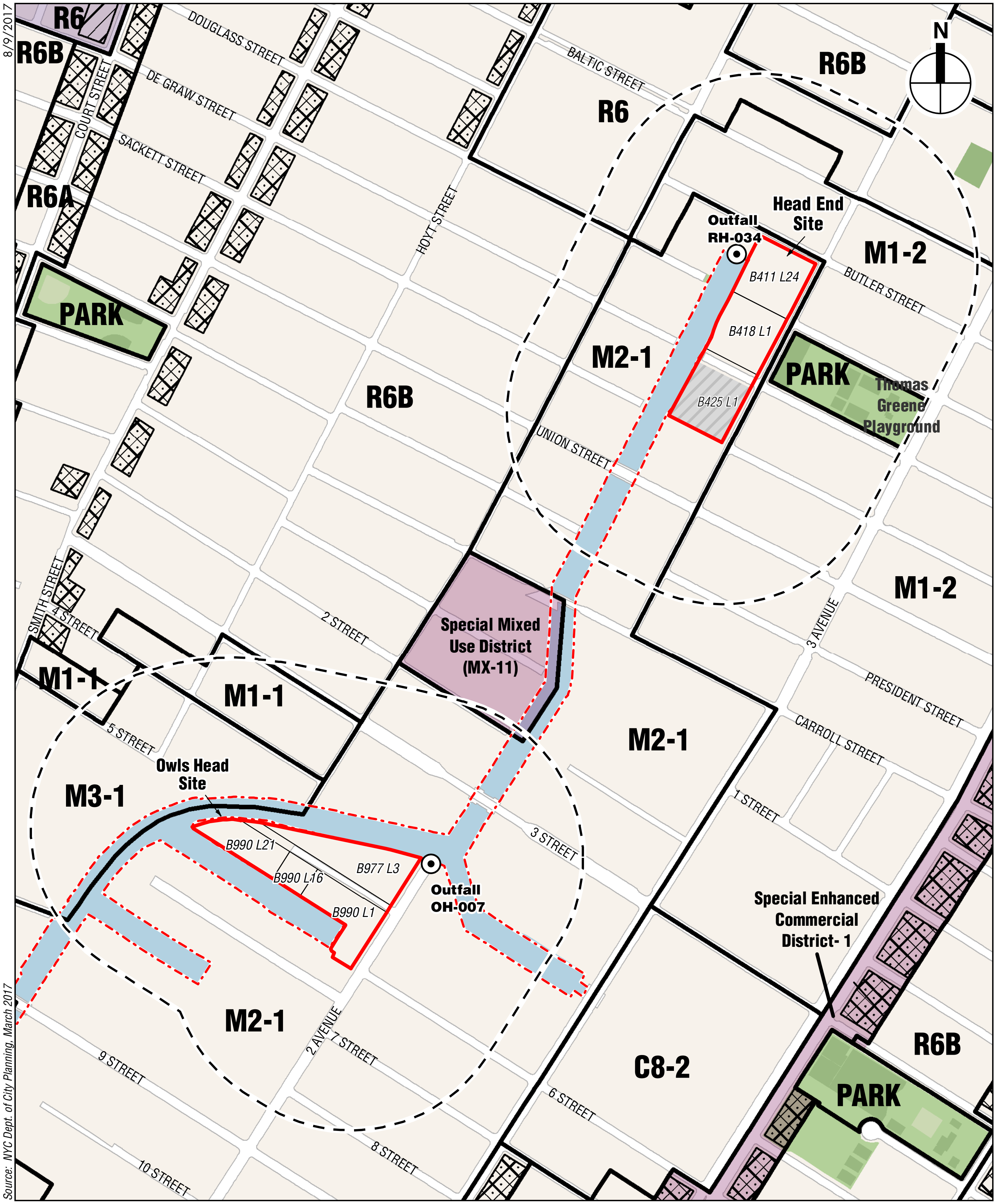
batching plants, bus storage and repair, distribution/warehousing and specialty/artisanal manufacturing. An office building adjacent to the Owls Head Site opposite 2nd Avenue contains facilities for the New York State Department of Corrections (DOC). Recently, the area has experienced more commercial development, in particular the Whole Foods supermarket north of the 4th Street turning basin along 3rd Avenue and former larger-format industrial buildings being repurposed and adapted by small-scale entrepreneurs, craft manufacturers and artists, shared office space operations, and tech companies. New commercial and mixed-use developments are currently planned or under construction, including a new self-storage facility along 6th Street east of the Owls Head Site and conversions to office space on the western side of the Canal, as discussed further below under “Future Conditions in the Analysis Year.” There are few residential buildings within the Owls Head Study Area, generally limited to the area west of the Canal along 3rd and Bond Streets.

ZONING

As shown on **Figure 2-3**, both the Head End Site and the Owls Head Site are located within a manufacturing zoning district (M2-1), which extends along both sides of the Canal south of Butler Street. The remainder of the Head End and Owls Head Study Areas are also primarily zoned manufacturing, including an M1-2 district within the Head End Study Area to the north and east of the Head End Site, and two manufacturing districts (M1-1 and M3-1) within the Owls Head Study Area on the western side of the Canal. In general, M2 and M3 districts permit heavy industrial uses, and M1 districts (generally used as buffers between M2 or M3 districts and commercial or residential areas) permit light manufacturing uses and warehouses. Commercial uses are generally permitted in manufacturing districts (although some commercial uses are not permitted in M2 and M3 districts) and residential uses are generally not permitted.

North of Baltic Street and west of Bond Street within the Head End Study Area are residential zoning districts (R6 and R6B). The R6 district is a general medium-density district that allows for a mix of residential building types; the R6B district is a lower-density, height-limited contextual district that allows for brownstone-style rowhouses and four- to five-story apartment buildings. In addition, a Special Mixed Use District (MX-11) is located within the Owls Head Study area on the western side of the Canal. Mixed use districts pair a light manufacturing district with a residential district to promote a balanced variety of uses. In mixed use districts such as this MX-11 district, residential and community facility development is generally controlled by the residential district regulations, while commercial and manufacturing development is controlled by the manufacturing district regulations.

Table 2-1 summarizes the zoning districts within the study areas and their applicable regulations, and **Figure 2-3** shows their location.



Project Sites
Study Areas (600-foot boundaries)
Gowanus Canal
Construction Staging Areas
Zoning Districts
C1-3 Commercial Overlay District
C1-4 Commercial Overlay District
C2-4 Commercial Overlay District
Special Purpose District
Outfall Locations

0 400 FEET

Gowanus Canal CSO Facilities

Zoning
Figure 2-3

Table 2-1
Zoning Districts in the Study Areas

Zoning District	Maximum FAR[1]	Uses/Zone Type
Project Sites Zoning		
M2-1	2.0 manufacturing and commercial	General manufacturing district; mainly mapped along waterfront industrial areas
Other Zoning Districts within the Study Areas		
M1-1	1.0 manufacturing and commercial 2.4 community facility (Use Group 4 only)	Light industrial uses (high performance), commercial and certain community facilities
M1-2	2.0 manufacturing and commercial 4.8 community facility (Use Group 4 only)	Light industrial uses (high performance), commercial and certain community facilities
M3-1	2.0 manufacturing and commercial	Heavy manufacturing district; designated for waterfront areas with heavy industrial uses including power plants, solid waste transfer facilities, and fuel supply depots
M1-4/R7-2 (Special Mixed Use District MX-11)	2.0 manufacturing and commercial 0.87-3.44 residential[2] 6.5 community facility	Mixed residential and light manufacturing district—residential and community facility development controlled by residential district regulations, commercial and manufacturing development controlled by manufacturing district regulations
R6	0.78-2.43 residential[3] 4.8 community facility	General residential district, medium-density housing.
R6B	2.0 residential 2.0 community facility	Contextual residential district, special lot coverage and height regulations to maintain the traditional residential scale

Notes:
[1] FAR is a measure of density establishing the amount of development allowed in proportion to the base lot area. For example, a lot of 10,000 square feet (sf) with an FAR of 1 has an allowable building area of 10,000 sf. The same lot with an FAR of 10 has an allowable building area of 100,000 sf.
[2] Maximum residential FAR is increased to 4.0 under Quality Housing regulations along wide streets outside of the Manhattan Core.
[3] Maximum residential FAR is increased to 3.0 under Quality Housing regulations along wide streets outside of the Manhattan Core.
Source: *New York City Zoning Resolution*.

The Head End Site and the Owls Head Site, as well as the other sites along the Canal within the study areas, are located on waterfront zoning lots as defined by Article VI, Chapter 2 of the Zoning Resolution ("Waterfront Zoning"), and are subject to Waterfront Zoning regulations. These regulations, among other policy objectives, encourage active water-dependent uses and improved access to the City's waterfront. Waterfront zoning regulations mandate that most residential, commercial, and community facility developments on waterfront zoning lots provide public open space along the water's edge with pedestrian links to upland communities; however, the waterfront open space requirement is generally not applicable to certain heavy commercial and industrial uses under Use Groups 16, 17, and 18 or certain infrastructure facilities (such as airports). In addition, waterfront zoning regulations provide for visual corridors (unobstructed views of the shoreline from upland public areas) through special urban design rules, which include special rules relating to building heights and required yards. In general, building structures are not permitted within visual corridors; however, as with the open space requirement, visual corridor requirements are not applicable to Use Groups 16, 17, and 18 facilities.

PUBLIC POLICY

GOWANUS BROWNFIELD OPPORTUNITY AREA NOMINATION STUDY

In April 2014, the Friends of Brooklyn Community 6 prepared the Gowanus Canal Brownfield Opportunity Area (BOA) Nomination Study to develop an economic development strategy that could encourage new investment in Gowanus's businesses and buildings while preserving and supporting the area's existing industrial and cultural uses. This community-driven BOA focuses on the strengths and weaknesses of Gowanus as a business location, and explores the needs of the area's businesses, industrial property owners, and workers. The study supports goals to promote and keep industrial businesses in the area. The areas where the Project would be located are within the study area of the BOA.

BRIDGING GOWANUS AND GOWANUS NEIGHBORHOOD PLANNING STUDY

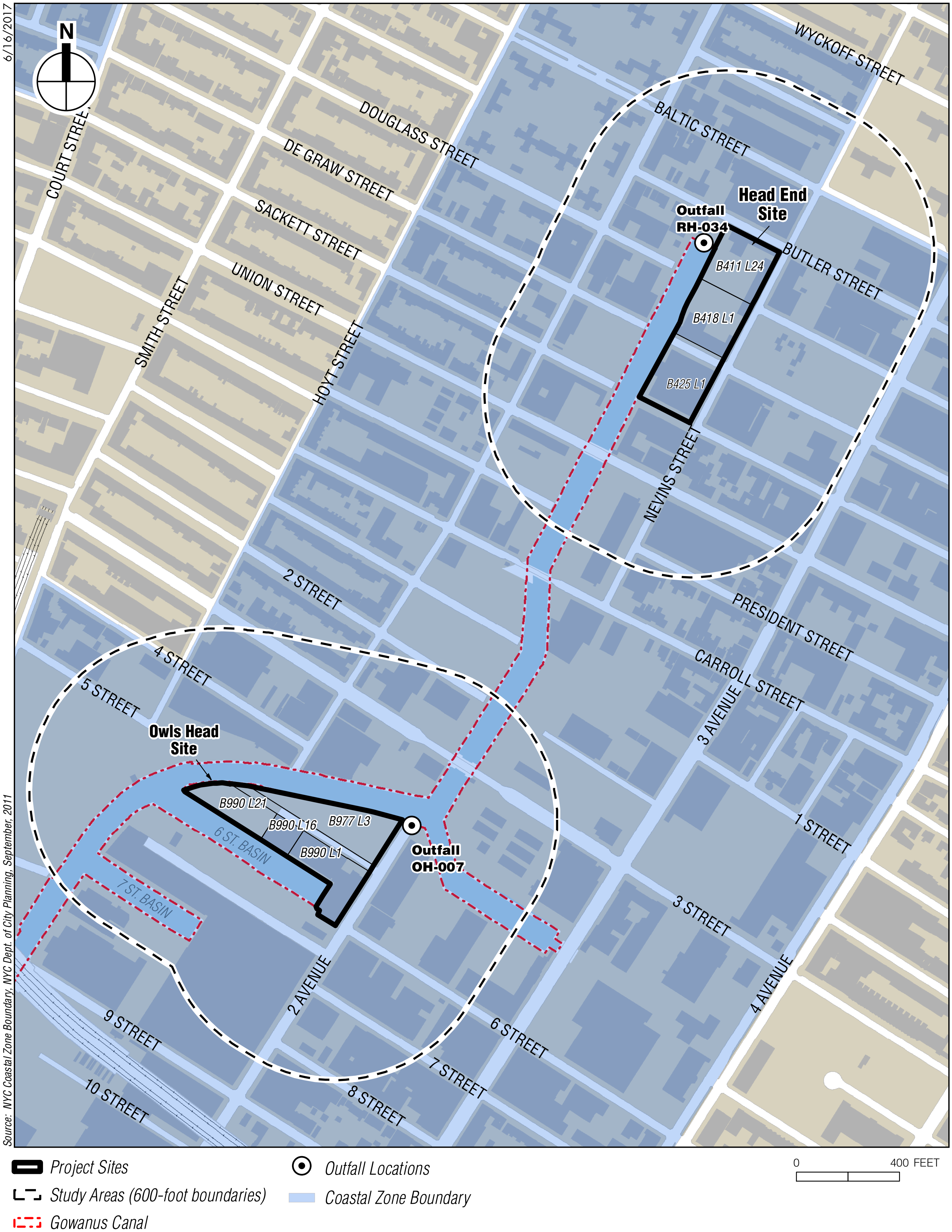
Beginning in 2013, the Gowanus neighborhood, including both study areas, was the subject of a community planning process involving local elected officials, residents, businesses, and community groups, which was known as "Bridging Gowanus." The purpose of the study was to develop a comprehensive plan for the neighborhood focusing on its infrastructure needs and future land use regulations. The recommendations of the study were released in the *Bridging Gowanus: Planning Framework* report in 2015 (the Report). In particular, the Report recommended modifications to the existing land use regulations with a focus on protecting the area's manufacturing businesses, encouraging a mix of "maker" facilities, including the creative arts, and preserving and promoting affordable housing.

In October of 2016, building on *Bridging Gowanus* and other community studies, DCP along with other City agencies initiated a comprehensive planning study of the neighborhood under the City's Planning for Livability, Affordability, Community, Economic Opportunity and Sustainability (PLACES) program. The Gowanus PLACES Neighborhood Planning Study seeks to foster a thriving, working, and more resilient neighborhood by reinforcing and encouraging a strong local economy anchored by a mix of uses and businesses, while creating opportunities for new housing with affordable housing in appropriate locations. In early 2017, the Study began a community outreach process to gather feedback on a variety of topics before developing and sharing a draft planning and land use framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study areas being rezoned to allow for residential use, among other uses and goals of the study, which is not presently permitted by the existing zoning in the area. However, the planning study is currently in its preliminary stages and its outcome and where new residential uses might be permitted is currently unknown.

NYC WATERFRONT REVITALIZATION PROGRAM

As shown on **Figure 2-4**, the Head End Site and the Owls Head Site are located within New York City's designated Coastal Zone, which is mapped in the area along the Canal. All projects that are subject to CEQR, the Uniform Land Use Review Procedure (ULURP), or other local, State, or federal agency discretionary actions that are situated within the City's Coastal Zone boundary must be reviewed and assessed for their consistency with New York City's Waterfront Revitalization Program (WRP). The WRP is the City's principal Coastal Zone management tool and establishes a broad range of public policies for the City's coastal areas. The guiding principle of the WRP is to maximize the benefits derived from economic development, environmental conservation, and public use of the waterfront, while minimizing the conflicts among these objectives. A local waterfront revitalization program, such as New York City's, is subject to approval by the New York State Department of State (NYSDOS) 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 and the Federal Coastal Zone Management Act.

The WRP was originally adopted in 1982 and revised in 2002. Additional revisions were approved by the New York City Council in 2013, and approved by NYSDOS (with the concurrence of the U.S. Department of Commerce) in 2016. The recent revisions include incorporation of climate change and sea



Gowanus Canal CSO Facilities

New York City Coastal Zone Boundary
Figure 2-4

level rise considerations to increase the resiliency of the waterfront area, promotion of waterfront industrial development as well as commercial and recreational water-borne activities, increased restoration of ecologically significant areas, and best practices for the design of waterfront open spaces. In addition, as part of the WRP revisions, the Coastal Zone boundary has been extended further inland in many locations to reflect alterations to Federal Emergency Management Agency (FEMA) flood zone maps.

Because the Project would be located in the Coastal Zone, and requires local, State, and federal discretionary actions (and/or equivalency reviews of regulatory compliance by responsible agencies), an assessment of the Project's consistency with applicable WRP policies was conducted.

INDUSTRIAL BUSINESS ZONE PROGRAM

The Owls Head Study Area (including the Owls Head Site) is located within the Southwest Brooklyn Industrial Business Zone (IBZ), one of 16 IBZs located throughout New York City and administered by the New York City Economic Development Corporation (NYCEDC). The Head End Study Area (including the Head End Site) is located in the Southwest Brooklyn IBZ Ombudsman Area in Gowanus. The IBZ program provides expanded services for industrial and manufacturing businesses, as well as tax credits to businesses that relocate to an IBZ, with the goal of protecting existing manufacturing districts and encouraging industrial growth citywide. The Industrial Ombudsman Program supports manufacturing businesses outside of the IBZ, including advising businesses on other City assistance programs and regulatory issues.

NEW YORK STATE EMPIRE ZONE PROGRAM

The Owls Head Study Area (including the Owls Head Site) and a portion of the Head End Study Area (including the Head End Site) are located within the State-designated Southwest Brooklyn Empire Zone. The Empire Zone program is administered by Empire State Development (ESD) and provides tax incentives to businesses in targeted areas in order to support expansions and job growth. Although the Empire Zone program ceased accepting new businesses in 2010, businesses already accepted into the program may continue to apply for and receive benefits.

D. FUTURE CONDITIONS IN THE ANALYSIS YEAR

LAND USE

As described in Chapter 1, "Project Description," the Project is mandated by the United States Environmental Protection Agency (USEPA) to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). USEPA and the New York State Department of Environmental Conservation (NYSDEC) have mandated other clean-up activities in the area of the Canal independent of the Project, including the installation of containment/cutoff walls, the excavation or stabilization of contamination on parcels along the Canal, the dredging of the Canal, the restoration of the 1st Street and 4th Street turning basins, and the installation of coal tar extraction wells. In particular, the properties comprising the Head End Site are located within National Grid's Remedial Investigation Parcel Boundaries, related to a former manufactured gas plant (MGP). Independent of the Project, these properties will be remediated by National Grid pursuant to administrative orders under the jurisdiction of NYSDEC and in coordination with the remediation required under CERCLA (see Chapter 10, "Hazardous Materials"). National Grid's remediation of the properties within the Head End Site will be completed prior to construction of the Head End Facility. In addition, National Grid is remediating a site of another former MGP located within the Owls Head Study

Area on the western side of the Canal; when completed, this remediation will allow for the redevelopment of the site with a mixed-use project (discussed further below).

This section describes other projects planned or expected to be constructed within the study areas by the Project's analysis year, 2028, in addition to the clean-up activities in the area that are independent of the Project.

HEAD END STUDY AREA

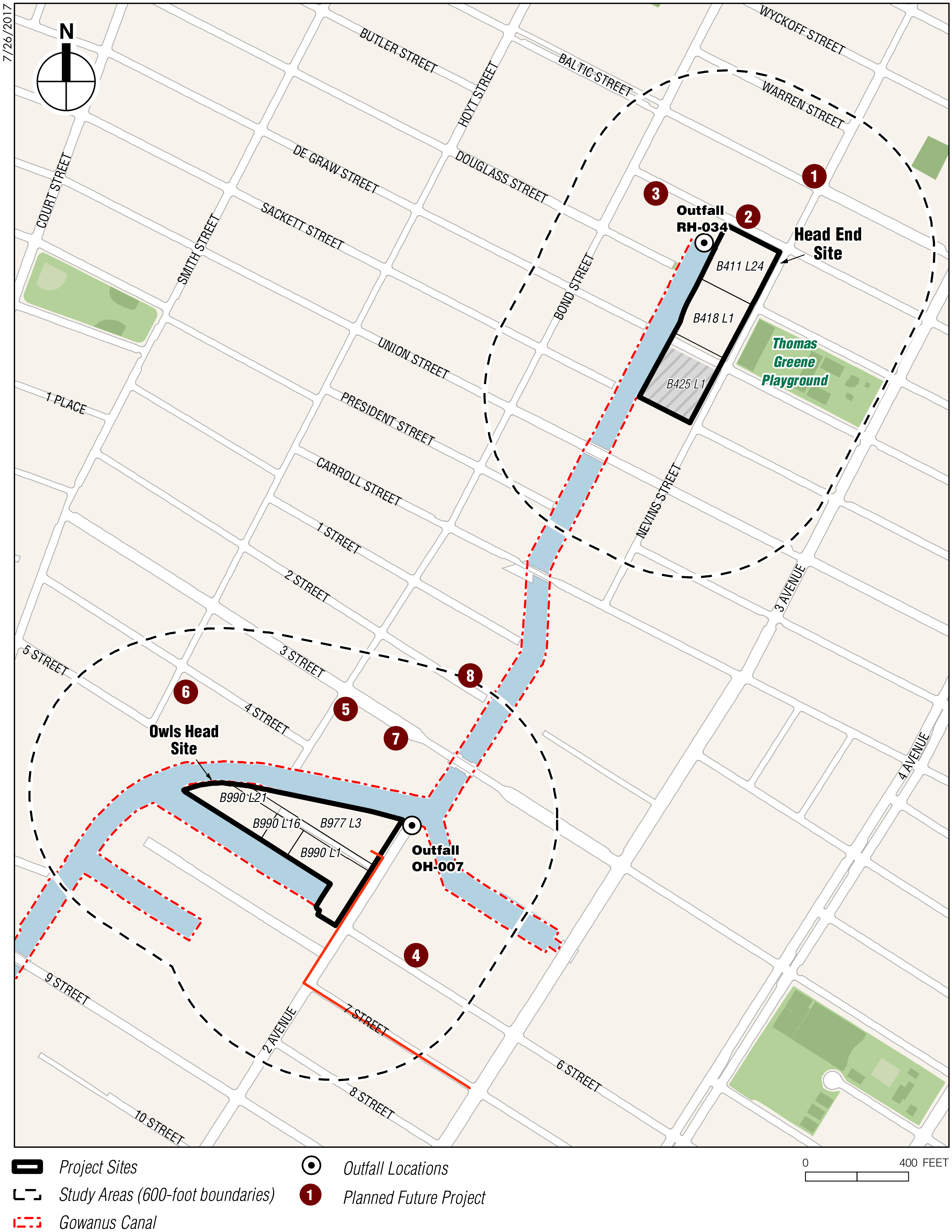
Three commercial projects are currently planned or under construction in the Head End Study Area. One of the projects, located immediately to the north of the Head End Site at 239 Butler Street, is the planned enlargement and conversion of a former manufacturing building into a 162-room hotel. While DOB permits for the project were disapproved, for the purposes of a conservative assessment, it is assumed to be complete by the 2028 analysis year. A second project at 489 Baltic Street would create a smaller hotel (15 rooms). Finally a project at 188 Butler Street would create a new 4,600-square-foot (sf) office building. If completed, these projects would not alter the land use character of the Head End Study Area, which is projected to continue the current mix of commercial and repurposed manufacturing buildings.

OWLS HEAD STUDY AREA

Five projects are currently planned, under construction, or recently completed in the Owls Head Study Area. One project, east of the Owls Head Site at 163 6th Street, is an approximately 76,000 sf self-storage facility. The remaining four projects are all located on the western side of the Canal. One of these projects, 363-365 Bond Street, is a large-scale development on the blocks between 2nd Street and Carroll Street along the western side of the Canal, which includes 700 residential units with retail and community facility space and a waterfront esplanade. One of the buildings in the development (365 Bond Street) was recently completed and has begun leasing rental units; the second building in the development (363 Bond Street) is nearing completion and has also begun leasing some rental units.

The three other projects on the western side of the Canal include new commercial space, including the conversion of former manufacturing or warehouse buildings at 124 3rd Street and 62 4th Street into office and retail space, as well as a proposed new commercial and manufacturing building at 148 3rd Avenue, which is being included for conservative analysis purposes.

Table 2-2, below, summarizes the anticipated future projects in the study areas, and **Figure 2-5** shows their location.



Planned Future Projects in the Study Areas

Figure 2-5

Table 2-2
Planned Future Projects in the Study Areas

Fig. Ref.[1]	Project Name/Address	Project Description/Program	Completion Date
Head End Study Area			
1	489 Baltic Street	Commercial: new 15-room hotel (10,000 sf)	By 2028[2]
2	239 Butler Street[3]	Commercial: expansion of former manufacturing building and conversion into 94,000 sf hotel (162 rooms)	UC
3	188 Butler Street	Commercial: new 4,600 sf office building	By 2028[2]
Owls Head Study Area			
4	163 6th Street (Cubesmart)	76,000 sf self-storage facility	UC
5	124 3rd Street	Commercial: conversion of two former warehouse buildings into office space (60,000 sf)	UC
6	62 4th Street	Commercial: conversion of former manufacturing building into retail and art gallery space (17,000 sf)	UC
7	148 3rd Street[4]	Mixed Use: new building with office (16,800 sf) and manufacturing (51,000 sf) space	By 2028[2]
8	365 Bond Street[5]	Mixed Use: large-scale development with residential (700 units), retail (2,600 sf) and community facility (2,250 sf) space, and a waterfront esplanade	UC

Notes: UC = Under Construction (assumed complete by 2028)
1. See **Figure 2-5.**
2. Planned projects with unknown completion dates (not currently under construction) are assumed to be complete by the Project's analysis year of 2028.
3. DOB permits for this project were disapproved; however, the project is assumed to be complete by the 2028 analysis year for the purposes of this assessment.
4. This project is assumed to be complete by the 2028 analysis year for the purposes of this assessment.
5. This project is partially complete and has begun leasing rental units.

Sources: NYC Dept. of Buildings; NYC Dept. of City Planning; 365 Bond Street Technical Memorandum (2013); AKRF, Inc. field survey, November 2016.

In addition to the projects discussed above, Public Place, a City-owned parcel, is located within the Owls Head Study Area on a six-acre property on the western side of the Canal south of 5th Street. As noted above, the Public Place site is a former MGP that is required to undergo remediation by National Grid under the jurisdiction of NYSDEC. A proposal exists to redevelop the site, which is being led by the New York City Department of Housing Preservation and Development (HPD) in partnership with private developers. The project is expected to include higher-density multi-family residential, including affordable housing, community, retail, and public open space. As the redevelopment cannot occur until the site is remediated and the timeline for the project's discretionary approvals (including a rezoning of the site for the expected uses) is not yet known, the construction period for the project is not known at this time and was not included as a No-Build development in this assessment.

ZONING

As noted above, DCP is currently conducting a comprehensive planning study of the Gowanus neighborhood in order to develop a future development framework for the area. As part of this initiative, DCP along with other City agencies began a community outreach process to gather feedback on a variety of topics before developing and sharing a draft planning and land use framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study areas being rezoned to allow for residential development, among other uses and goals of the study, which is not presently permitted by the existing manufacturing zoning in the area. However, the study is currently in its preliminary stages, and the outcome of the planning and land use framework is currently unknown. Therefore, for the purposes of this EIS and the land use, zoning, and public policy assessment, the existing zoning regulations and associated current patterns and trends applicable to the Head End Site, the Owls Head Site, and the study areas are assumed to remain in place in the 2028 analysis year.

PUBLIC POLICY

No modifications to public policies applicable to the study areas are currently anticipated or proposed to be enacted by the 2028 analysis year.

E. PROBABLE IMPACTS OF THE PROJECT

LAND USE

PROJECT SITE

As discussed in Chapter 1, "Project Description," the Project would demolish the existing buildings at the Head End Site and the Owls Head Site and construct two CSO Facilities.[2]

Head End Site

As discussed in Chapter 1, "Project Description," the Project would result in the construction of the Head End Facility on properties that currently contain light-industrial and auto-related facilities. The Facility would consist of a below-grade structure containing the 8 million gallon (MG) tank and tank system, and a two-story above-grade structure. The above-grade structure would be located at the northern end of the site, with the remainder of the surface area on the site expected to be paved and accessible for maintenance and operations, and to include landscaping where appropriate. The design of the Facility would include a 50-foot setback from the bulkhead wall, and would provide some form of waterfront public access. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site would be determined through additional facility design in consultation with the local community and other City agencies. Construction of the Head End Facility would also include construction of a new sewer on Nevins Street from the intersection with Sackett Street to the intersection with Butler Street.

The construction staging area at the Head End Site would not contain any permanent facilities as a result of the Project.

Owls Head Site

At the Owls Head Site, the Project would result in the construction of the Owls Head Facility on properties that currently contain a DSNY storage yard for road salt and snow plows, a privately owned street, a vehicle storage lot, automobile repair and shipping businesses, and a community-sponsored composting program. Construction of the Owls Head Facility would also include replacement of the existing bulkhead and a new force main to connect the Owls Head Facility to the Owls Head Interceptor. The Facility would consist of a below-grade structure containing the 4-MG tank and tank system, and a two-story above-grade structure. The Owls Head Site would accommodate both the Owls Head Facility and the DSNY facility, which would remain on the site. The remainder of the surface area on the site is

[2] Construction of both facilities would also require rerouting of the sewer system and off-site improvements such as the construction of a new outfall and force main for the Owls Head Facility, and sewer line improvements at the Head End Facility, as discussed in detail in Chapter 1, "Project Description."

expected to be paved and accessible for maintenance and operations, and would include landscaping where appropriate. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility.

The activities conducted by the Gowanus Canal Conservancy, such as periodic environmental education and stewardship events, would also remain on the site.

STUDY AREA

The Project would be limited to the construction of the CSO Facilities at the Head End Site and the Owls Head Site, and would not result in any new development or new uses on other sites within the study areas.

ASSESSMENT

Head End Site

The Head End Facility would be part of the extensive sewer infrastructure system present in the Head End Study Area—which includes pumping stations, regulators, CSO outfalls, and the DEP Gowanus Wastewater Pumping Station immediately to the west of the Head End Site—and would be compatible with the existing sewer infrastructure in the study area. Similarly, the Head End Facility would be compatible with the other nearby uses within the study area, including distribution/warehouse, light industrial, and commercial and residential uses, with an increasing commercial component (office and hotel uses) that is expected to be developed by the 2028 analysis year. In particular, the Head End Facility would not conflict with residential uses in the Head End Study Area, including the multi-family apartment building and artists' lofts at 282 Nevins Street (the residential use nearest the Head End Site). With the use of an odor control system, which is expected to operate continuously (i.e., 24 hours a day) and would be designed to meet the New York State ambient air quality standard for hydrogen sulfide and the *CEQR Technical Manual* criteria to control both odors and hydrogen sulfide from wastewater processes, as well as mechanical equipment located either indoors or below grade, operation of the Head End Facility would not result in disturbances at nearby residential uses due to odors or noise (see Chapters 15, "Air Quality," and 17, "Noise"). Similarly, operation of the Head End Facility would not have an effect on the adjacent Thomas Greene Playground and would result in the addition of some form of publicly accessible open space along the Canal as compared with the manufacturing and auto-related uses that currently block access to the Canal and, potentially, additional public access areas and/or public amenities that could help stitch together the new public open space and Thomas Greene Playground. As discussed further below, the Head End Facility would comply with the applicable M2-1 zoning requirements, and would therefore not result in a non-conforming use within the Head End Study Area. In addition, use of the property as a temporary construction staging area would not pose conflicts to nearby land uses, as it would not result in any permanent facilities on the construction staging area.

Owls Head Site

Similar to the Head End Facility, the Owls Head Facility would be part of the extensive sewer infrastructure system present in the Owls Head Study Area, and would be compatible with existing sewer infrastructure. The Owls Head Facility would also be compatible with the other uses in the Owls Head Study, which are generally light-manufacturing, light-industrial, and commercial uses (the Owls Head Study Area contains fewer sensitive uses, such as residential and open space uses, as compared with the Head End Study Area). Residential uses in the Owls Head Study Area are generally located on the west side of the Canal, including the new higher-density residential development that is partially complete at 385 Bond Street, and would not be affected by disturbances from odors or noise due to operation of the Owls Head Facility. The design of the Owls Head Facility would allow for the existing uses on the Owls

Head Site (the DSNY facility and GCC activities) to remain on the site, and may also allow for potential accessible waterfront open space. As with the Head End Facility, the Owls Head Facility would comply with the applicable M2-1 zoning requirements, and would therefore not result in a non-conforming use within the Owls Head Study Area.

Overall, the Project would be compatible with existing land uses in the study areas, and would not result in any significant adverse land use impacts.

ZONING

The CSO Facilities, which would collect, retain, and store CSO, are considered to be Use Group 18, similar to other CSO control facilities, such as DEP's Paerdegat Basin CSO facility in Brooklyn. Use Group 18 facilities are permitted uses in the M2-1 zoning district applicable to both the Head End Site and the Owls Head Site.[3] The facilities are designed to meet all applicable zoning requirements; although not required for Use Group 18 facilities under Waterfront Zoning, the design of the Head End Facility would provide some form of waterfront public access and open space, which along with other potential elements of the project would be developed further through the public process and broader planning work ongoing in the area. The Project would not result in any changes to the zoning regulations applicable to the Head End Site, the Owls Head Site, or any other site within the study areas. Therefore, the Project would not result in a significant adverse impact to zoning.

PUBLIC POLICY

WATERFRONT REVITALIZATION PROGRAM

Introduction

In accordance with the City's WRP and the federal Coastal Zone Management Act, the Project was reviewed for its consistency with the City's WRP. The WRP includes 10 principal policies designed to maximize the benefits derived from economic development, environmental preservation, and public use of the waterfront, while minimizing the conflicts among those objectives. *CEQR Technical Manual* guidelines note that the preparation of the WRP consistency assessment should begin with the completion of a WRP Consistency Assessment Form ([CAF]—see **Appendix 2-1** for the CAF). The questions presented in the CAF are designed to identify whether a project has potential effects on a policy. Where the answers to the CAF indicate that the Project does not have any potential effect on the achievement of any particular policy (i.e., policies not applicable to the Project), no further assessment of the Project's potential effects on WRP policies is necessary. Where answers to the questions indicate that the Project may have potential effects on the achievement of one or more policies, further examination is warranted to assess these effects.

WRP Consistency Assessment

The analysis provided below includes a discussion of each applicable policy, and the Project's consistency with that policy.

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[3] The uses listed in Use Group 18 are permitted in M1 or M2 Districts if such uses comply with all of the applicable performance standards for such districts (ZR 42-00). As the Facilities would meet or exceed the applicable performance standards for the M2-1 zoning district, they are a permitted use under zoning.

Policy 4: *Protect and restore the quality and function of ecological systems within the New York City Coastal Area.*

Policy 4.5: Protect and restore tidal and freshwater wetlands.

As discussed in Chapter 9, “Natural Resources,” the Gowanus Canal is a National Wetland Inventory (NWI)-mapped E1UBLx wetland and a NYSDEC-mapped littoral zone tidal wetland. Although the Canal does not meet the definition of a wetland under the Clean Water Act, it is subject to regulation as a Water of the United States. Construction of the Head End Facility is expected to include modifications to outfall RH-038, which may result in the temporary disturbance of about 550 square feet of NYSDEC littoral zone tidal wetland due to installation of a turbidity curtain and temporary cofferdam, but no permanent impacts to NYSDEC littoral zone tidal wetland in the vicinity of the outfalls. In addition, construction of the Owls Head Facility is expected to include modifications to outfall OH-007, located at the end of 2nd Street, which would have the potential to result in the temporary disturbance of about 500 square feet of NYSDEC littoral zone tidal wetlands in the immediate vicinity of the outfall location due to installation of a turbidity curtain and temporary cofferdam, and approximately 650 square feet (0.01 acres) of permanent impacts to NYSDEC littoral zone tidal wetland within the footprint of the replacement bulkhead extending approximately two feet waterward into the Canal. This minimal loss would not result in significant adverse impacts to NYSDEC littoral zone wetlands. Portions of the Owls Head Facility would be constructed within the NYSDEC-regulated tidal wetland adjacent area. Construction would adhere to Development Restrictions outlined by NYSDEC Tidal Wetlands regulations (6 NYCRR Part 661), including a 30-foot setback of all permanent structures from the delineated wetland boundary and a restriction of impervious surface within the Project Site to a maximum of 20 percent, including new and existing structures. Should the design of the Owls Head Facility not meet the Development Restrictions, DEP would request a variance under 6 NYCRR PART 661.11 (or its equivalent under CERCLA). DEP will explore options for avoiding impacts to wetlands. However, if impacts to wetlands are unavoidable, DEP will explore mitigation options with USACE, NYSDEC, and USEPA, particularly for the small areas of vegetated marsh near the Owls Head Facility.

Construction of the Project would utilize Sediment and Erosion Control protective measures and best management practices, such as turbidity curtains, silt fences, and inlet (catch basin) protection, in accordance with a Stormwater Pollution Prevention Plan (SWPPP) to prevent and minimize indirect impacts to wetlands. All construction activities that would take place within waters of the United States and NYSDEC littoral zone tidal wetlands would be completed in compliance with any conditions required by the USEPA under Section 404 of the Clean Water Act and NYSDEC under Articles 15 and 25 of the NY ECL, or through equivalent approvals.

Policy 4.7: 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.

As part of the construction of the CSO Facilities, sheet pile cofferdams would be placed at outfall OH-007 and potentially at outfall RH-038, which would result in temporary increases in suspended sediment and underwater noise during cofferdam installation and removal. Potential installation of bending weirs at or near the RH-034 and RH-038 outfalls, if they are placed below mean high water, would also be completed within a cofferdam. Installation of the new bulkhead at the Owls Head Facility would also have the potential to result in sediment resuspension. As discussed in Chapter 9, “Natural Resources,” installation of the cofferdams and the bulkhead would not have significant adverse effects on aquatic biota: any sediment re-suspension that would occur would be temporary, minimal, and localized, and would be well below physiological impact thresholds of larval fish and benthic macroinvertebrates. In addition, the flow of water through the Canal, as influenced by the Flushing Tunnel and tidal processes, would dissipate any re-suspended sediments such that re-deposition in the Canal would not adversely affect benthic macroinvertebrates or bottom-dwelling finfish. Demolition and reconstruction of outfall OH-007 would be contained within the cofferdams and would not result in additional sediment re-suspension that could affect aquatic biota. Similarly, although installation of the sheet pile for the cofferdam structures would result in temporary increased underwater noise levels, these noise levels would not be expected to exceed the threshold for physiological injury to fishes.

Furthermore, as noted above, the Project would reduce the amount of CSO entering the Canal, which would contribute to improvements in water and sediment quality, and therefore, would help to improve aquatic habitat for the migratory species that occur in the area. Therefore, the Project would not result in significant adverse impacts on water quality, aquatic habitat, or aquatic biota of the Canal, and is consistent with this policy.

Policy 4.8: Maintain and protect living aquatic resources.

As discussed above under Policy 4.7, the Project would not result in significant adverse impacts to aquatic biota, including fish populations, due to sediment re-suspension or noise, and would contribute to improvements in water and sediment quality that would improve aquatic habitat. Therefore the Project would protect and improve habitats and water quality to preserve aquatic resources, and is consistent with this policy.

Policy 5: *Protect and improve water quality in the New York City Coastal Area*

Policy 5.1: Manage direct or indirect discharges to waterbodies.

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

The two CSO Facilities along the Canal would, during certain wet weather events, collect and retain flows from the combined sewer system, then pump the flows to the Red Hook WWTP and the Owls Head WWTP once there is sufficient downstream capacity in the sewer system. Excess flow (i.e., exceeding the capacity of the tanks at the Facilities) would pass through the Facilities and receive primary treatment via mechanical screens before being discharged through nearby outfalls to the Canal. As a result of the Project, CSO volumes and pollutant loads discharging to the Canal would be significantly reduced, and the Project would result in improvements to water quality in the Canal.

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

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

As discussed above under Policy 4.7, construction of the Project would include in-water construction activities (particularly the installation and removal of cofferdams) which would affect NYSDEC littoral zone wetland and result in temporary and localized increases in suspended sediment. However, any re-suspended sediment from in-water construction activities would be expected to dissipate relatively quickly and would not result in significant adverse long-term impacts to water quality. Demolition and reconstruction of outfall OH-007 would be conducted within cofferdams and would not result in additional sediment re-suspension or subsequent adverse impacts to water quality. In addition, upland demolition and construction activities would be undertaken in accordance with erosion and sediment control plans and best management practices incorporated into the SWPPP prepared for the Project, and would not result in adverse impacts to water quality from stormwater discharge during construction. Construction within the NYSDEC-regulated tidal wetland adjacent area would adhere to Development Restrictions outlined.by NYSDEC Tidal Wetlands regulations. Should the design of the Owls Head Facility not meet the Development Restrictions, DEP would request a variance under 6 NYCRR PART 661.11 (or its equivalent under CERCLA). DEP will explore options for avoiding impacts to wetlands. However, if impacts to wetlands are unavoidable, DEP will explore mitigation options with USACE, NYSDEC, and USEPA, particularly for the small areas of vegetated marsh near the Owls Head Facility.

In addition, as noted above, the Project would result in improvements to water quality in the Canal through improved CSO management, which would have a beneficial impact on wetlands; therefore, the Project is consistent with these policies.

Policy 5.5: Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.

As noted above under Policy 5.2, the Project would result in a significant reduction of CSO volumes discharged to the Canal. The Project would include further sewer infrastructure upgrades in order to manage wastewater flows to and from the Facilities, including the replacement or rehabilitation of pumping stations, regulators, and outfalls, as well as the construction of a new force main to connect the Owls Head Facility to the Owls Head Interceptor. Therefore, the Project would make improvements to sewer infrastructure (commonly referred to as “grey” infrastructure) which would reduce pollutant loads discharged to the Canal, and is consistent with this policy.

Policy 6: *Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.*

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

Both the Head End Site and the Owls Head Site are located within the 100-year flood plain (Zone AE); the 100-year 2015 Preliminary Flood Insurance Rate Map (FIRM) base flood elevation (BFE) of the Head End Site is 10 feet NAVD88. The 2015 Preliminary FIRM BFE of the Owls Head Site is 11 feet NAVD88. The Project would construct CSO Facilities at both sites with tanks and pumping systems located largely below grade (below the BFE), and would be designed with protection measures such as tide gates to prevent waters from the Canal from backing up into the Facilities. The Facilities would be designed in accordance with DEP’s April 2017 Preliminary Climate Resiliency Design Guidelines for wastewater conveyance and treatment infrastructure, which requires that sensitive and critical equipment be located 40 inches above the 100-year BFE.

At the Head End Facility, the first floor of the Facility’s superstructure would be set at an elevation of 13 feet NAVD88, 36 inches above the BFE. However, all critical equipment would be placed on 4-inch tall equipment pads to put them at an elevation of approximately 13.3 feet NAVD88, which is 40 inches above the 100-year BFE. Similarly, at the Owls Head Facility, the first floor would be set at an elevation of 14 feet NAVD88, 36 inches above the BFE. All critical equipment would be placed on 4-inch-tall equipment pads at an elevation of about 14.3 feet NAVD88, 40 inches above the BFE. Therefore, the Facilities would be appropriately protected in order to ensure that they remain operational during flooding events, and the Project would be consistent with this policy.

Policy 6.2: Integrate consideration of the latest New York City projections of climate change and sea level rise (as published by the NPCC, or any successor thereof) into the planning and design of projects in the city's Coastal Zone.

Guidance provided by DCP[4] recommends a detailed methodology to determine a project's consistency with Policy 6.2. A summary of this process is provided below.

1. *Identify vulnerabilities and consequences: assess the project's vulnerabilities to future coastal hazards and identify what the potential consequences may be.*
   a. *Complete the Flood Evaluation Worksheet.*

The information in the following subsections is based on the results of the completed worksheet, which is provided in **Appendix 2-1**.

   b. *Identify any project features that may be located below the elevation of the 1% floodplain over the lifespan of the project under any sea level rise scenario.*

The overall lifespan of the Head End and Owls Head Facilities is 100 years, and the lifespan of critical equipment for both Facilities such as mechanical equipment for pumping, settling, and treatment processes and main power transformers and network protectors, is 50 years. The New York City Panel on Climate Change (NPCC) projected that sea levels are likely to increase by up to 10 inches by the 2020s, 30 inches by the 2050s, 50 inches by the 2080s, and up to 75 inches by the end of the century under the "High" scenario projections, relative to the 2000-2004 base period (the most recent projections from the NPCC were issued in 2015). Under the "Middle" scenario projections, sea levels are likely to increase by up to 8 inches by the 2020s, 21 inches by the 2050s, 39 inches by the 2080s, and up to 50 inches by the end of the century.

Under current conditions, the Head End Site and Owls Head Site are both located within the 100-year floodplain, Zone AE (an area of high flood risk subject to inundation by the 1% annual-chance flood event). The 2015 Preliminary FIRM BFE for the Head End Site is 10 feet NAVD88, and the BFE for the Owls Head Site is 11 feet NAVD88. Based on the NPCC projections, the 100-year flood elevation for the Head End Site may rise to 12.5 feet NAVD88 (high projection) by the 2050s, 14.8 feet by the 2080s, and 16.25 feet NAVD88 by the end of the century. The 100-year flood elevation for the Owls Head Site may rise to 13.5 feet NAVD88 (high projection) by the 2050s, 15.8 feet by the 2080s, and 17.25 feet NAVD88 by the end of the century. The below-grade features (i.e., tanks and pumping systems) for each Facility are currently below the 100-year flood elevation, and would continue to be located below projected elevations.

The ground floor of the Head End Facility would be constructed at an elevation of 13 feet NAVD88, and critical equipment within the structure would be placed on 4-inch equipment pads, placing it at an elevation of approximately 13.3 feet NAVD88 which is 40 inches above the current 100-year flood elevation. Additionally, the electrical room and network protection would be at a higher floor elevation of 15 feet NAVD88, 60 inches above the BFE.

The ground floor of the Owls Head Facility would be at an elevation of 14 feet NAVD88, and critical equipment would be placed on 4-inch equipment pads at an elevation of about 14.3 feet NAVD88, 40 inches above the BFE. The electrical room and network protection room would be placed at a floor elevation of 15 feet NAVD88.

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[4] DCP. *The New York City Waterfront Revitalization Program: Climate Change Adaptation Guidance.* March 2017.

Based on the NPCC's high projection scenario, the ground floor and critical equipment of both Facilities would be above the projected flood elevation in the 2050s, and the ground floor and mechanical equipment would be below the projected flood elevations in the 2080s at the end of the equipment's lifespan. At the end of the lifespan of the electrical room and network protection room during the 2080s, this critical equipment would be above the projected flood elevation at the Head End Facility and below the projected flood elevation at the Owls Head Facility under the high projection. Under the high middle range projection during the 2080s (13.25 feet at the Head End Facility and 14.25 feet at the Owls Head Facility) the ground floor would be below the flood elevation but the mechanical and the electrical rooms would be above the projected flood elevation.

   c. *Identify any vulnerable, critical, or potentially hazardous features that may be located below the elevation of Mean Higher High Water (MHHW) over the lifespan of the project under any sea level rise scenario.*

Based on the range of sea level rise predictions described above, MHHW at the NOAA Station nearest the study area (currently 2.28 feet NAVD88 at the Battery Station #8518750) could range up to 8.53 feet NAVD88 by the end of the century. Given these projections, and the ground-floor elevations of the two Facilities' superstructures (13 feet NAVD88 at the Head End Facility and 14 feet NAVD88 at the Owls Head Facility), both of which are above the highest projected MHHW levels, no vulnerable, critical, or potentially hazardous features within the Head End Site or the Owls Head Site would be below MHHW.

   d. *Describe how any additional coastal hazards are likely to affect the project, both currently and in the future, such as waves, high winds, or debris.*

While the Head End Site and the Owls Head Site are on the shoreline, wave action hazards (i.e., Zone VE or Coastal AE Zone) have not been designated for the sites by FEMA. Therefore, storm impacts due to waves, high winds, or debris would not be expected to affect either the Head End Facility or Owls Head Facility.

2. *Identify adaptive strategies: assess how the vulnerabilities and consequences identified in Step 1 are addressed through the project's design and planning.*

   a. *For any features identified in Step 1(b), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection. Describe how would any planned adaptive measures protect the feature in the future from flooding?*

As described above, both Facilities would be designed in accordance with DEP's April 2017 Preliminary Climate Resiliency Design Guidelines. Based on the guidance, critical equipment in the Facilities would be placed on equipment pads to place them at least 40 inches above the 100-year flood elevation at each site. At this elevation, critical equipment at both Facilities would be raised above the highest NPCC projections of the 100-year flood elevation for the 2050s. Mechanical equipment at both Facilities and the electrical room and network protectors at the Owls Head Facility would be below the flood elevation under the high projection scenario in the 2080s. The electrical room and network protectors would still be above the projected flood elevation in the 2080s at the Head End Facility under the high projection. All critical equipment would be above the high middle range projection in the 2080s. If necessary, based on the future floodplain boundaries and BFE levels resulting from SLR, additional floodproofing measures, such as raising critical equipment when it is replaced at the end of its estimated 50-year lifespan, would be implemented in order to ensure that the Facilities remain operational during flooding events through the end of the 100-year lifespan for the

Facilities' structures. The below-grade features at each Facility would be designed with protection measures such as tide gates to prevent waters from the Canal from backing up into the Facilities.

b. For any features identified in Step 1(c), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection. Describe how would any planned adaptive measures protect the feature in the future from flooding?

As described above in Step 1(c), no vulnerable, critical, or potentially hazardous features would be below MHHW under any sea level rise projection scenario.

c. Describe any additional measures being taken to protect the project from additional coastal hazards such as waves, high winds, or debris.

As described in Step 1(d), the Head End Site and Owls Head Site are not within a wave impact zone in the City's designated flood hazard area. Therefore, no specific measures are required.

d. Describe how the project would affect the flood protection of adjacent sites, if relevant.

Because the floodplain within New York City is controlled by astronomic tide and meteorological forces (e.g., nor'easters and hurricanes) and not by fluvial flooding, the Project would not have the potential to adversely affect the floodplain or result in increased coastal flooding at adjacent sites or within the study area. Through the proposed infrastructure upgrades and system reroutes, the Project is designed to reduce the volume of CSOs entering the Canal. The Project would result in conveyance of combined sewer flow, including stormwater, to the new Facilities where it would be stored until there is sufficient downstream capacity to convey the stored flow to either the Red Hook or Owls Head WWTP. Influent wet weather flows that exceed the capacity of the storage tanks are expected to occur during less than 20 percent of the typical year storm events at the Head End Facility, and less than 10 percent of the typical year storm events at the Owls Head Facility. The storage of water at the Facilities would effectively reduce the volume of water entering the Canal during wet weather events (76 percent reduction at outfall RH-034, and 85 percent reduction at outfall OH-007), and may result in reduced potential for impacts from flooding. Construction of the replacement bulkhead along 320 linear feet of shoreline at the Owls Head Site would also stabilize the shoreline and minimize the potential impacts from flooding.

3. Assess policy consistency: conclude whether the project is consistent with Policy 6.2 of the Waterfront Revitalization Program.

The Head End Site and Owls Head Site are within the 100-year floodplain, but are not within a wave impact zone in the flood hazard area. The Facilities have been designed at elevations above the 2015 Preliminary FIRM BFE, and would raise critical equipment at least 40 inches above the 100-year BFE, in accordance with DEP's April 2017 Preliminary Climate Resiliency Design Guidelines for wastewater conveyance and treatment infrastructure. Electrical equipment would be constructed at an elevation of 15 feet NAVD88, just above the current 500-year flood elevation and more than 40 inches above the BFE. The below-grade features of each Facility would be below the 100-year floodplain under the existing and projected elevations, and as such, would be designed with protection measures such as tide gates to prevent water from the Canal from backing up into the Facilities. The ground floors would be below the projected 100-year flood elevations in the 2080s under the high middle range projection, but critical equipment would be above the projected 100-year flood elevations at the end of the lifespan of this equipment (see **Figures 2-6a and 2-6b**). As described above, if necessary given future floodplain boundaries and SLR, additional floodproofing measures (e.g., raising critical equipment) would be implemented when equipment is replaced at the

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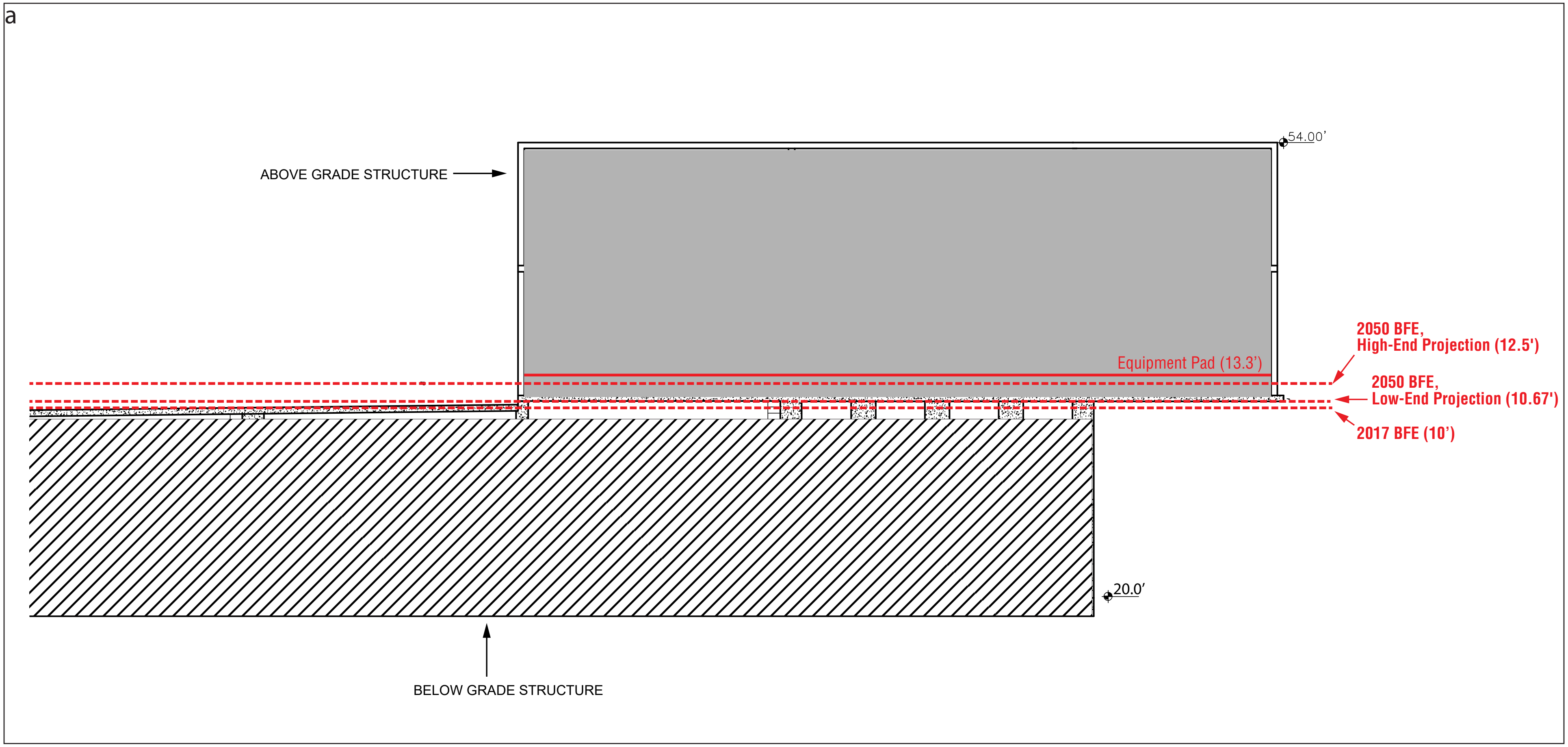
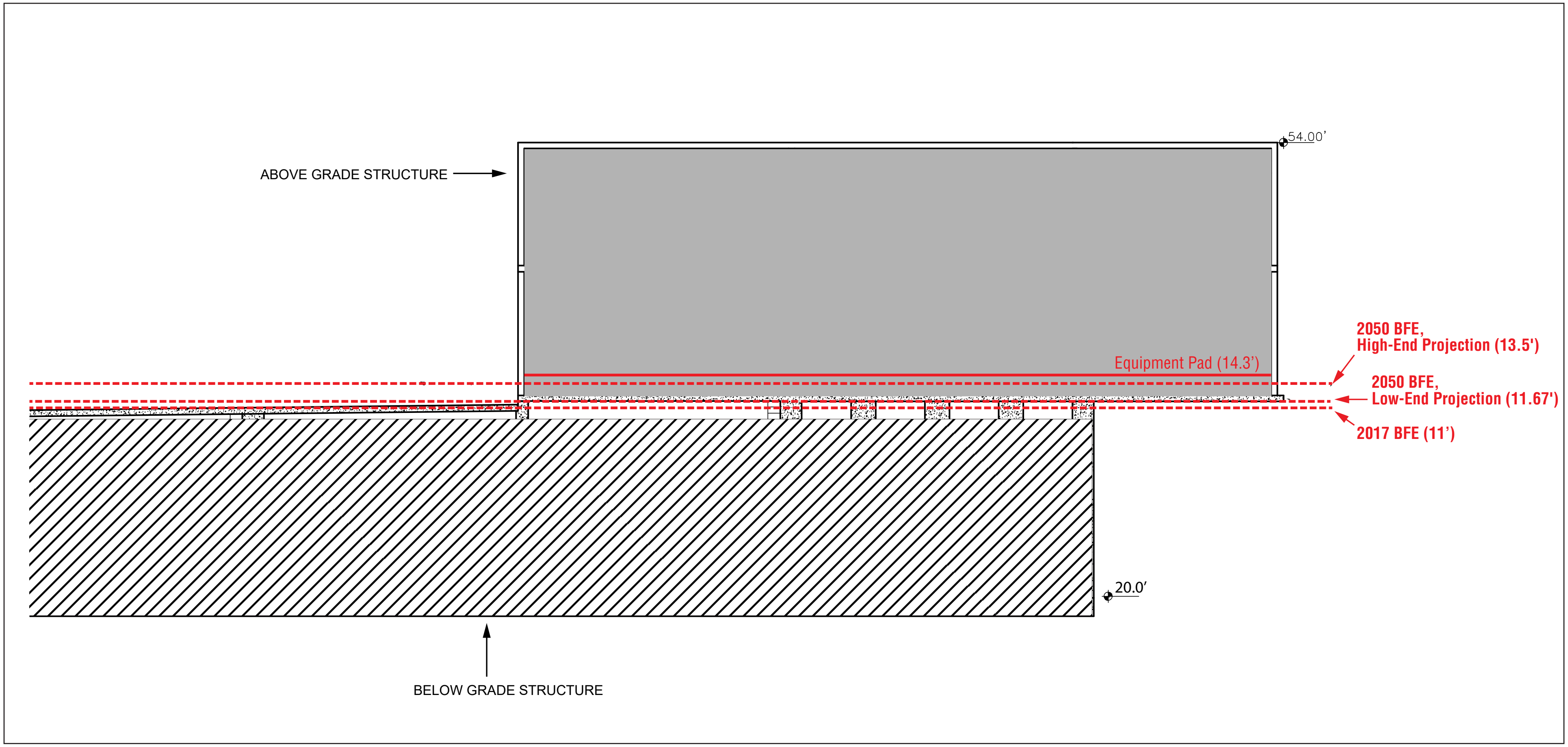


*All critical equipment will be placed on 4 inch pads to put them 40 inches above the 100-yr flood elevation

NOT TO SCALE

Head End Facility—
Conceptual Facility Design Elevations

Figure 2-6a



**All critical equipment will be placed on 4 inch pads to put them 40 inches above the 100-yr flood elevation*

NOT TO SCALE

Owls Head Facility—
Conceptual Facility Design Elevations

Figure 2-6b

end of its 50-year lifespan in order to ensure that the Facilities remain operational during flooding events. The Facilities would reduce the amount of CSOs being discharged through outfalls RH-034 and OH-007, which may result in reduced potential for impacts from flooding. Therefore, in meeting DEP standards for flood protection accounting for projected SLR, the Facilities and adjacent areas would remain appropriately protected, and the Project is consistent with this policy.

Policy 7: *Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.*

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

Policy 7.2: Prevent and remediate discharge of petroleum products.

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

As discussed in Chapter 10, “Hazardous Materials,” both the Head End Site and the Owls Head Site are known to have subsurface contamination, largely due to historic industrial activities in the area along the Canal. The Head End Site is located within National Grid’s Remedial Investigation Parcel Boundaries for the former Fulton Manufactured Gas Plant (MGP): subsurface contamination at the Head End Site was evaluated in prior investigations conducted by National Grid as well as a Pre-Design Investigation (PDI) conducted by DEP in 2017. The PDI included the collection and analysis of soil, groundwater and soil vapor samples at locations within the footprint of the CSO Facility and at locations adjacent to the CSO Facility footprint. Coal tar contamination was observed in the majority of the soil samples at depths ranging from approximately 6 to 150 feet below grade. Independent of the Project, National Grid will conduct remediation of the Head End Site pursuant to administrative orders under the jurisdiction of NYSDEC and in coordination with the remediation required under CERCLA by USEPA. Further, National Grid will also construct a bulkhead barrier wall and design a permanent groundwater management system at the Head End Site pursuant to an Administrative Order issued by USEPA in May 2017. Construction of the Head End Facility will require deep excavations and dewatering. These activities would serve to remove contamination from the site to a greater extent than would likely occur independent of the Project with only National Grid’s cleanup of the site, as NYSDEC does not typically require such deep excavation for cleanup, even if deep contamination is present.

A 2015 subsurface investigation report of the Owls Head Site confirmed the presence of contaminants likely attributable to historical fill material on the site. In 2017, DEP conducted a Pre-Design Investigation (PDI) at the Owls Head Site, and coal tar contamination was observed in the majority of soil samples at depths ranging from approximately 30 to 60 feet, which is within the sand below the fill material and meadow mat. ~~30 to 35 feet and in one boring at 57 to 59 feet, which is within the sand below the fill material and meadow mat. Laboratory test results are not yet available.~~ Any coal tar contamination that is within the limits of excavation for the CSO Facility will be properly managed during construction. Any coal tar contamination remaining at the site after construction of the CSO Facility would be addressed in coordination with the USEPA and NYSDEC. The Owls Head Site is not being remediated independent of the Project and is not subject to NYSDEC controls. Therefore, without the Project, no redevelopment or remediation would occur at the Owls Head Site, and the historical fill and any coal tar or associated contamination would remain.

Construction of both the Head End Facility and the Owls Head Facility would incorporate controls to prevent unacceptable exposures to construction workers, the general public, and/or the environment. ~~Prior to construction, further investigation of both sites would be performed to better determine the nature and extent of wastes that would be generated, to characterize the excavated material for the purpose of selecting disposal facilities, and to determine appropriate safety procedures.~~ Investigations of both sites were performed by DEP to better determine the nature of the soils that would be excavated during construction, the water that may require dewatering, and the soil vaper present within the soil. Based on the results of the~~se additional investigations and the other~~ investigations that have ~~already~~ been completed and, if determined to be necessary, any additional investigations , site-specific Remedial Action Plans (RAPs) or Soil and Groundwater Management Plans (SGMPs) and Construction Health and Safety Plans (CHASPs) would be prepared for both the Head End Site and the Owls Head Site and submitted to DEP for review and approval; it is anticipated that one or both of NYSDEC and USEPA ~~may also~~would be involved in reviewing these plans and determining appropriate measures for the Head End and Owls Head Sites. These documents would address subsurface disturbance (of soil and groundwater) including soil management procedures, appropriate clean fill importation criteria (for surface soils in landscaped areas), handling, stockpiling, testing, transportation, and disposal of excavated materials, including any encountered contaminated soil and petroleum storage tanks, in accordance with applicable regulatory requirements. The CHASPs would ensure that ~~all~~ soil disturbance is performed in a manner protective of workers, the general public, and the environment, including procedures for odor, dust, and nuisance control, as well as air monitoring requirements for the workers and the community.

In addition, construction of the CSO Facilities would include measures to identify and dispose of suspect asbestos-containing materials (ACM), lead-based paint (LBP) or lead-containing paint (LCP), polychlorinated biphenyl (PCB)-containing equipment or lighting fixtures, and chemicals during demolition of the existing structures ~~on the site~~ in accordance with applicable regulatory requirements. Prior to any demolition or excavation activities with the potential to disturb known aboveground or underground petroleum storage tanks, these tanks would be closed and removed, along with any contaminated soil, in accordance with applicable requirements and guidelines including NYSDEC spill reporting and tank registration requirements. If tanks are ~~unexpectedly~~ discovered during construction, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. Similarly, any dewatering required for construction of the Facilities would be conducted in accordance with applicable permitting requirements: DEP requirements if discharged to a sewer connected to either the Red Hook or Owls Head WWTP, or NYSDEC requirements if discharged directly to the Canal or via an existing storm sewer connecting to the Canal.

With implementation of these measures, the Project would not result in any significant adverse effects related to hazardous materials, and is therefore consistent with this policy.

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

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

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

As stated in Policy 8.2, all developments on the shoreline that receive public financial assistance, or ~~is~~ are on publicly owned land, should, to the extent practicable, provide some form of public access unless public access would be inconsistent with the operational needs of a facility or public area would not be safely accessible. In consideration of the goal of providing public access along the waterfront where it is feasible, safely accessible, and does not interfere with the operation of the CSO Facilities, DEP would incorporate public access along the Canal to the extent practicable. In particular, the CSO Facilities include above-grade structures and areas that are expected to be paved and accessible for maintenance and operations, with landscaping where appropriate. Specifically, the Head End Site, located adjacent to the Thomas Greene Playground, would include a 50-foot setback from the bulkhead wall, and would provide some form of waterfront public access. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies. At the Owls Head Site, the DSNY facility at the site would be accommodated along with the Owls Head Facility, and would be accessible to the public following completion of construction; the site could also be accessible for GCC activities following completion of construction. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility. Therefore, the Project would provide public access where it would be consistent with the functional and operational needs of the CSO Facilities, does not preclude the development of public access, and is consistent with these policies.

Policy 8.3: Provide visual access to the waterfront where physically practical.

As discussed in Chapter 8, "Urban Design and Visual Resources," the CSO Facilities are being designed to enhance the urban design character of the Head End Site and Owls Head Site, as well as the surrounding area, and to provide views of the waterfront through the sites to the extent practicable. In particular, it is anticipated that the Head End Site would include public areas accessible from street level, possibly with landscaping elements atop the below-grade tank area. It is also anticipated that the Head End Site would include a 50-foot setback from the bulkhead wall and would provide some form of waterfront public access along the Canal. The proposed publicly accessible areas on the Head End Site would create new views of the Canal from nearby areas by removing existing structures and manufacturing facilities which limit visual and physical access to the Canal, thereby improving westward views from the adjacent Thomas Greene Playground. DEP is also evaluating the potential for the Owls Head Site to include accessible waterfront open space, and the anticipated landscaping elements would be an aesthetic improvement over existing conditions, and would be designed to provide visual access to the Canal to the extent practicable. Therefore, the Project is consistent with this policy.

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

As noted above in the response to Policies 8.1 and 8.2, the Project would provide public access where it would be consistent with the functional and operation needs of the CSO Facilities, in particular at the Head End Site. The Head End Site has been determined to be an appropriate site for waterfront public access, as it is adjacent to the Thomas Greene Playground, and may serve to link this park to the waterfront. At the Owls Head Site, the DSNY facility at the site would be accommodated along with the Owls Head Facility, and would be accessible to the public following completion of construction; the site could also be accessible for GCC activities following completion of construction. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility. Overall, the Project does not preclude the development of public access, and is consistent with this policy.

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

The Project would not result in a loss of public interest in and use of lands and waters held in public trust; rather, the Project includes the acquisition of up to seven properties for a public use (i.e., to support the CSO Facilities and construction staging areas). Therefore, the Project would result in an increase in public use of land in the area near the Canal, and is consistent with this Policy.

Policy 8.6: Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.

As noted above, the Project would incorporate public access areas where it is feasible and would not interfere with the operation of the CSO Facilities, in particular at the Head End Site. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies. Through this consultation process, it is expected that the public access areas would be designed to include features and amenities consistent with the City's open space design principles. Therefore, the Project is consistent with this Policy.

Policy 9: *Protect scenic resources that contribute to the visual quality of the New York City Coastal Area.*

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

As discussed in Chapter 8, "Urban Design and Visual Resources, the Facilities are being designed to enhance the urban design character of the project sites and surrounding area, and to provide views to and through the project sites to the extent practicable. In particular, the Head End Facility would enhance the pedestrian experience of the urban design character of areas near the Head End Site by removing existing structures and manufacturing facilities, and providing public areas accessible from street level, possibly with landscaping elements atop the below-grade tank area. It is also anticipated that the Head End Site would include a 50-foot setback from the bulkhead wall, and would provide some form of waterfront public access along the Canal. These changes would be expected to enhance views of the waterfront from vantage points near the Head End Site, in particular from the adjacent Thomas Greene Playground. Similarly, at the Owls Head Site, the DSNY facility at the site would be accommodated along with the Owls Head Facility, and would be accessible to the public following completion of construction; the site could also be accessible for GCC activities following completion of construction. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility. Further, the anticipated landscaping elements would be an aesthetic improvement over existing conditions. The Project would also comply with applicable zoning regulations regarding bulk and built form, and would result in physical and visual changes consistent with zoning regulations along the Canal.

Therefore, the pedestrian experience in certain areas along the Canal close to the Head End Facility and the Owls Head Facility, including views of the Canal, would be enhanced with the new project components, and the Project is consistent with this policy.

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

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

As discussed in Chapter 7, "Historic and Cultural Resources," the Head End Site and Owls Head Site are both located in the State/National Register (S/NR)-eligible Gowanus Canal Historic District, which was proposed for listing on the S/NR by the New York State Historic Preservation Office (SHPO) in 2014. In response to community comments, the New York State Board for Historic

Preservation review for the State Register listing of the Gowanus Canal Historic District has been postponed. SHPO ~~decided not to pursue the listing of the historic district and thereafter~~ made a determination that the Gowanus Canal Historic District is S/NR-eligible in 2012. In correspondence dated July 3, 2017, SHPO determined that the buildings on the Owls Head Site are non-contributing to the Historic District and that the properties on the Head End Site at 242 Nevins Street, 270 Nevins Street, and the two-story former Gowanus Station at 234 Butler Street (Block 411, Lot 24) and associated one-story extensions on Butler and Nevins Street~~— on the Head End Site~~ are contributing resources within the Historic District.

Demolition of S/NR-eligible properties would constitute a significant adverse impact to architectural resources on the Project Site and to the S/NR-eligible Gowanus Canal Historic District. Therefore, DEP has determined that demolition of the buildings at 242 and 270 Nevins Street and the two- and-one story portions of 234 Butler Street, which is necessary in order to construct the Head End Facility as mandated by USEPA, would constitute a significant adverse impact to architectural resources on the Head End Site and to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. As the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from USACE or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act of 1966. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA in consultation with SHPO and the City, will seek ways to minimize or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition and is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, and as discussed above, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would incorporate some salvageable significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

~~Consultation with SHPO and the New York City Landmarks Preservation Commission (LPC) will be undertaken to explore measures to avoid, minimize, and mitigate the demolition of these buildings; this may include preparation of a feasibility study that would evaluate the potential of retaining the structures in a manner that would allow the Project to meet its goals and objectives.~~

In addition to the potential mitigation related to the demolition of historically significant buildings or structures, a Construction Protection Plan (CPP) would be prepared and implemented in consultation with SHPO and LPC and in conformance with DOB's *Technical Policy and Procedure Notice* (TPPN) #10/88 to avoid any inadvertent construction-related impacts to two individually S/NR-eligible architectural resources located within 90 feet of the Head End Site. With further consultation among DEP, SHPO, and LPC, if necessary additional protection measures may be implemented during construction of the Project for other properties near the Head End Site, the Owls Head Site, or areas of in-street sewer line improvements. With these mitigation and construction protection measures in place, the Project would minimize the potential significant adverse impact to architectural resources to the extent practicable. The Project would not be expected to have any indirect, contextual impacts on the surrounding architectural resources near the Head End Site and Owls Head Site as the Project would result in a low-rise industrial facilities and paved areas similar to other properties in the Historic District.

Therefore, in consideration of the Project's goals of constructing the CSO Facilities as mandated by USEPA, the Project would protect historic resources to the extent practicable and would minimize the impact to the historic character of the area of the Gowanus Canal Historic District near the Head End Site and the Owls Head Site, and does not hinder this policy.

Policy 10.2: Protect and preserve archaeological resources and artifacts.

As discussed in Chapter 7, "Historic and Cultural Resources," several previous archaeological surveys have assessed the archaeological sensitivity of the region surrounding the Gowanus Canal. These studies identified areas of potential sensitivity for archaeological resources correlated with various historic periods. Based on these previous surveys, it was determined that areas that would be affected by construction of the Project are potentially sensitive for various types of archaeological resources. In particular, portions of the Head End Site and Nevins Street (which would potentially be disturbed for in-street sewer line improvements) are sensitive for deeply buried resources from the prehistoric period and resources associated with historic mills that operated in the area in the 18th and early 19th centuries. In addition, portions of 7th Street that may be disturbed for in-street sewer line improvements associated with the Owls Head Facility are potentially sensitive for human remains associated with a Revolutionary War-era mass grave reported to have been located in the area. However, due to the extensive disturbances and redevelopment in the area, the only archaeological resource types with a high likelihood of retaining sufficient integrity are resources associated with the industrial use of the Head End and Owls Head Sites and S/NR-eligible timber cribbing associated with construction of the Canal in the mid-19th century. The cribbing is expected to be located on both the Head End Site and the Owls Head Site and could extend up to 50 feet inland from the Canal's bulkhead at either site.

As the Project would result in ground disturbance in areas of potential archaeological sensitivity, additional analyses, including either archaeological monitoring or an alternative method of analysis, would be developed in consultation with SHPO and LPC in order to mitigate any potential significant adverse impacts on archaeological resources. Consultation would be also be undertaken with SHPO and LPC to identify measures to avoid, minimize, or mitigate adverse impacts at the Owls Head Site associated with the removal and replacement of the Canal bulkhead (identified as contributing to the S/NR-eligible Gowanus Canal Historic District, described above). By incorporating the necessary mitigation measures, the Project would reduce the direct impacts on potential archaeological resources and may result in data recovery during construction of the CSO Facilities. Therefore, the Project is consistent with this policy.

PUBLIC POLICY ASSESSMENT

The Project would not result in any changes to public policies affecting the Head End Site, the Owls Head Site, or the study areas. The WRP consistency assessment concludes that the Project would be consistent with the policies of the WRP. DCP has reviewed the WRP assessment (WRP No. 16-194) and has concurred that the Project is consistent with WRP policies.

At the Owls Head Site, the Project would result in a CSO Facility located in an area that is subject to public policies aiming at the preservation of industrial facilities, in particular the City's IBZ program. As discussed in Chapter 3, "Socioeconomic Conditions," construction of the Owls Head Facility would potentially displace four industrial businesses (Warehousing and Transportation industry sector businesses) that are currently located on the Owls Head Site. However, the displacement of these businesses are not expected to result in a significant loss of industrial employment or affect business conditions for the other industrial businesses in the area, therefore construction of the Owls Head Facility would not conflict with the City's goal of retaining industrial uses within the IBZ.

As noted in Chapter 1, "Project Description," both the Head End Facility and the Owls Head Facility require NYC ULURP approval, but will undergo ULURP at different times due to having different design and construction schedules.

For the Head End Facility, the ULURP would include site selection, property acquisition and an amendment to the City Map involving the elimination of Douglass Street between the Canal and Nevins Street. This demapping is not necessary for the project, but reflects that, with the acquisition of the property and the construction of the Head End Facility, the street would not be built, and the ULURP for demapping will follow the ULURP for site selection and acquisition. Pursuant to City policy, City capital projects requiring a Site Selection approval must undergo a Fair Share analysis that applies the *Criteria for the Location of City Facilities* (the "Fair Share Criteria" or "Criteria") as set forth in Appendix A to Title 62 of the Rules of the City of New York (RCNY). The consideration of the Fair Share criteria is discussed and presented in **Appendix 2-2,** and concludes that the Head End Facility is consistent with the City's Fair Share policy.

For the Owls Head Facility, DEP is proceeding with the environmental review process and evaluating property acquisition needs and is continuing to develop the facility and site plans, which will inform the schedule for the acquisition and ULURP processes for the Owls Head Facility.

Overall, the Project would not result in any significant adverse impacts to public policy governing the Head End Site, the Owls Head Site, and the study areas. ✷

Chapter 3: Socioeconomic Conditions

A. INTRODUCTION

This chapter describes the socioeconomic changes that could result from the Project and assesses whether such changes could result in potential significant adverse impacts. As described in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, the socioeconomic character of an area is mainly a function of its population, housing, and economic activity. Socioeconomic changes may occur when a project directly or indirectly changes any of these elements. The objective of this analysis is to assess whether any changes would result in a significant adverse impact compared with the future without the Project.

The *CEQR Technical Manual* guidelines recommend examination of five ways in which a project could alter socioeconomic conditions: direct residential displacement; direct business displacement; indirect residential displacement; indirect business displacement; and adverse effects on specific industries. As detailed in Section C, "Screening Assessment," based on *CEQR Technical Manual* guidance, analysis of the following three concerns is warranted: direct business displacement; indirect business displacement; and potential adverse effects on specific industries.

B. METHODOLOGY

Changes to an area's socioeconomic character may occur directly or indirectly as a result of a project. Direct (or primary) displacement is defined by CEQR as the involuntary displacement of residents or businesses from a site or sites directly affected by a project. Examples of direct displacement include a proposed redevelopment of a currently occupied parcel for a new use or structure, or a proposed easement or right-of-way that would take a portion of a parcel, rendering it unfit for its current use.

Indirect (or secondary) displacement is defined by CEQR as the involuntary displacement of residents, businesses, or employees that results from a change in socioeconomic conditions created by a project. Examples of indirect displacement include lower-income residents compelled to leave due to rising rents caused by a new concentration of higher-income housing introduced by a project, or a similar turnover of industrial uses being compelled to leave in favor of higher-paying commercial tenants attracted to an area because of a successful office project.

Adverse effects on specific industries occur if the project affects the ability of a specific industry or industry sector to serve its customers or other businesses within the industry. Examples of effects on specific industries include the displacement of businesses that provide goods and services to a substantial number of residents or workers, or if the project would result in the loss or substantial diminishment of a particularly important product or service within the industry.

SOCIOECONOMIC STUDY AREA DEFINITION

A socioeconomic study area is the area within which a project could directly or indirectly affect population, housing, and economic activities. A study area typically encompasses a project area and adjacent areas within approximately 400 feet, ¼-mile, or ½-mile, depending upon the project size and area characteristics. A ¼-mile radius was chosen for the Project because potential business displacement effects could extend beyond a 400-foot radius of the Head End Site and Owls Head Site (the Project Sites) [1]. In particular the area east of the Gowanus Canal, which is primarily zoned industrial, includes many businesses that could potentially be affected.

Because socioeconomic analyses depend on demographic, employment and business data, the *CEQR Technical Manual* suggests adjustment to a study area boundary to conform to the census tract delineation that most closely approximates the desired radius; in this case, a ¼-mile radius surrounding the Project Sites. For this analysis, the census tracts that comprise the “socioeconomic study area,” or “study area,” are shown in **Figure 3-1**. The study area, therefore, includes Census Tracts 71, 75, 77, 119, 121, and 127 and is roughly bounded by the Brooklyn Queens Expressway to the south, Court Street to the west, Bergen Street to the north, and 4th Avenue to the east.

DATA SOURCES

The assessments of business displacement and potential effects on specific industries consider business and employment trends in the study area, as compared with those in Brooklyn (Kings County) and New York City in order to provide greater context for the study area’s economic activities. The data used to estimate the numbers and types of businesses are from the New York State Department of Labor (NYSDOL) Quarterly Census of Employment and Wages (QCEW) database. The data represent annual averages for 2015. QCEW data for the study area were compiled at the census-tract level by the New York City Department of City Planning’s (DCP’s) Housing, Economics, and Infrastructure Planning (HEIP) Division in February of 2017.

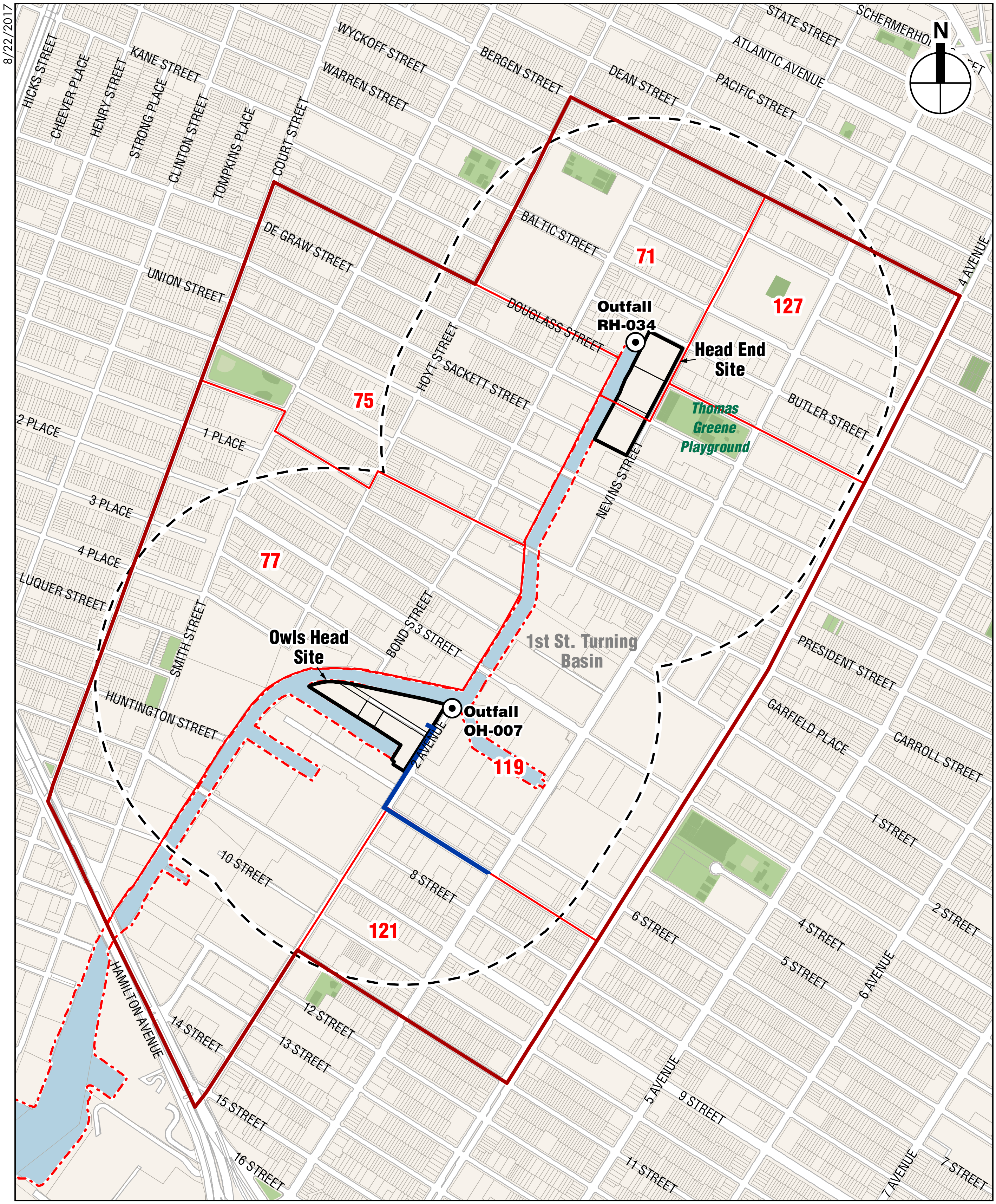
QCEW data were augmented by tenant information available through the Department of Finance (DOF) property search tool and by MapPLUTO Data maintained by DCP, and further supplemented by numerous field surveys conducted during November and December 2016 and January 2017. During the field surveys, land uses and economic activities were characterized. In addition, businesses that could be directly displaced by the Project were identified. Field surveys were supplemented by on-line information, including websites of businesses that would be directly displaced by the Project, as well as Google Street View. Employment estimates for businesses observed on the Project Sites are based on field observations, standard industry employment density ratios commonly used for CEQR analyses, as well as employment density ratios provided by DCP and industry databases such as Manta and Bloomberg.

C. SCREENING ASSESSMENT

Following *CEQR Technical Manual* guidelines, a socioeconomic analysis begins with a screening assessment that determines the need for further analysis. This section describes the *CEQR Technical Manual* screening analysis threshold circumstances that can lead to socioeconomic changes warranting further analysis, and compares those thresholds (in bold italics below) to the Project.

[1] A larger ½-mile study area is appropriate for projects that would potentially increase the ¼-mile area population by more than 5 percent. Since the Project would not introduce new residential or commercial uses, the study area was limited to a ¼-mile buffer surrounding the Project Sites.

8/22/2017



Project Sites

Gowanus Canal

1/4-Mile Radius of Project Sites

New Force Main

Outfall Locations

Socioeconomic Study Area

77 *Census Tracts >50% within the 1/4-mile boundary*

0 1,000 FEET

Gowanus Canal CSO Facilities

Socioeconomic Study Area

Figure 3-1

Direct residential displacement: Would the project directly displace population to the extent that the socioeconomic character of the neighborhood would be substantially altered? Displacement of fewer than 500 residents would not typically be expected to alter the socioeconomic character of a neighborhood.

The Project would not directly displace any residential uses. Therefore, an assessment of direct residential displacement is not warranted.

Direct and indirect business displacement: Would the project directly displace more than 100 employees, or would it displace any business that is unusually important because its products or services are uniquely dependent on its location, are subject to policies or plans aimed at its preservation, or that serves a population uniquely dependent on its services in its present location? For projects exceeding this threshold, assessments of direct business displacement and indirect business displacement are appropriate.

At the Head End Site, the Project would require the use of two lots (Block 418, Lot 1 and Block 411, Lot 24) for installation of the CSO Facilities, as well as a third lot (Block 425, Lot 1) for construction staging. At the Owls Head Site, the Project would require the use of five lots (Block 990, Lots 1, 16 and 21 and Block 977, Lots 1 and 3). The Project would require the displacement of all uses located on these lots, with the exception of the New York City Department of Sanitation (DSNY) salt storage facility and community-sponsored composting program on Block 977, Lot 3, which would remain on the site; currently, there are 19 businesses operating on the lots. The estimated employment associated with these 19 businesses exceeds the 100-employee CEQR threshold, and other study area businesses may be dependent on their products and services. As such, further analysis of direct business displacement and indirect business displacement is warranted, and is included in Section D, "Preliminary Assessment."

Indirect displacement due to increased rents: Would the project result in substantial new development that is markedly different from existing uses, development, and activities within the neighborhood? Residential development of 200 units or fewer or commercial development of 200,000 square feet or less would typically not result in significant socioeconomic impacts.

The Project would not introduce any residential or commercial development. Therefore, an assessment of potential indirect displacement due to increased rents is not warranted. Along with the evolving characteristics of the study area, including existing development forces and the proposed benefits the Project may have on the Canal, indirect effects on rents and property values may occur in the study area that cannot be reflected/quantified in this analysis.

Indirect business displacement due to market saturation: Would the project add to, or create, a retail concentration that may draw a substantial amount of sales from existing businesses within the study area to the extent that certain categories of business close and vacancies in the area increase, thus resulting in a potential for disinvestment on local retail streets? Projects resulting in less than 200,000 square feet of retail on a single development site would not typically result in socioeconomic impacts.

The Project would not introduce any commercial development; therefore, an assessment of potential indirect business displacement due to market saturation is not warranted.

Adverse effects on specific industries: Is the project expected to affect conditions within a specific industry? An analysis is warranted if a substantial number of residents or workers depend on the goods or services provided by the affected businesses or if the project would result in the loss or substantial diminishment of a particularly important product or service within the industry.

An assessment of potential adverse effects on specific industries is warranted if a proposed project directly displaces businesses that are part of the value chain of a specific industry in the area. As noted below, the

Project would displace a motion picture studio, which is part of the *Motion Picture and Sound Recording Industry* sector and estimated to account for 25 of the 35 total employees employed by the sector in the study area. Because of the significance of the displaced business for this specific sector in the study area, a preliminary assessment is warranted. This preliminary assessment will determine whether a substantial number of workers depend on the services provided by this affected business and whether the displacement of this business would have an effect on the *Motion Picture and Sound Recording Industry* sector in the study area or in the City.

Section D, “Preliminary Assessment” addresses whether the Project could significantly affect business conditions in any industry or category of business within or outside the study area, or whether it could lead to substantial reduction in employment or impair viability in a specific industry or category of business.

Based on the above screening assessment, the Project warrants further assessment of direct and indirect business displacement, and adverse effects on specific industries.

D. PRELIMINARY ASSESSMENT

Preliminary assessments are conducted to learn enough about the potential effects of a project to either rule out the possibility of significant adverse impacts, or to conclude that a more detailed analysis is required to fully determine the extent of the impacts. As described in Section E, “Conclusion,” this preliminary assessment finds that detailed analyses are not warranted.

DIRECT BUSINESS DISPLACEMENT

The *CEQR Technical Manual* defines direct business displacement as the involuntary displacement of businesses (including institutional uses) from the site of, or a site directly affected by, a project. In accordance with the guidelines, displacement of a business or group of businesses is not, in itself, considered a significant adverse environmental impact. While all businesses contribute value to the City’s economy, the *CEQR Technical Manual* specifies consideration of the following in determining the potential for significant adverse impacts: (1) whether the businesses to be displaced provide products or services essential to the local economy that would no longer be available to local residents or businesses; and (2) whether adopted public plans call for preservation of such businesses in the area.

As detailed below, the Project could directly displace 19 businesses and an estimated 184 jobs associated with those businesses. As such, a preliminary assessment of direct business displacement was conducted, examining the employment and business value characteristics of the affected businesses. The analysis begins with a description of overall business activities within the study area. Businesses and employment that would be directly displaced by the Project are then described. CEQR assessment criteria are used to determine whether such displacement could result in significant adverse impacts.

ECONOMIC ACTIVITY IN THE STUDY AREA

Private Sector Employment

As of 2015, there were an estimated 11,916 private-sector employees in the study area (see **Table 3-1**). Study area private-sector employees represented 2.1 percent of the total private-sector employment in Brooklyn (i.e., Kings County), and approximately 0.3 percent of New York City’s private-sector employment.

Table 3-1
2015 Private-Sector Employment in the Socioeconomic Study Area, Brooklyn, and New York City

	Study Area		Brooklyn		New York City	
	Employees	% of Total	Employees	% of Total	Employees	% of Total
Accommodation and Food Services	1,244	10%	43,737	8%	340,034	10%
Administrative and Support and Waste Management and Remediation Services	170	1%	28,763	5%	216,193	6%
Arts, Entertainment, and Recreation	227	2%	7,941	1%	81,719	2%
Construction	1,168	10%	28,927	5%	134,116	4%
Educational Services	357	3%	28,433	5%	174,196	5%
Finance and Insurance	27	0%	16,756	3%	324,514	9%
Health Care and Social Assistance	3,231	27%	178,462	32%	647,463	18%
Information*	293	2%	9,928	2%	174,603	5%
Management of Companies and Enterprises	-	NA	3,063	1%	68,304	2%
Manufacturing	579	5%	21,165	4%	77,182	2%
Other Services (except Public Administration)	615	5%	27,677	5%	167,757	5%
Professional, Scientific, and Technical Services	423	4%	20,543	4%	382,520	11%
Real Estate and Rental and Leasing	202	2%	17,117	3%	125,865	4%
Retail Trade	1,425	12%	74,406	13%	347,266	10%
Transportation and Warehousing	956	8%	19,317	3%	112,865	3%
Unclassified	-	NA	6,362	1%	18,819	1%
Utilities	-	NA	4,287	1%	15,188	0%
Wholesale Trade	890	7%	25,053	4%	135,343	4%
Other[4]	**109**	**1%**	**83**	**0%**	**325**	**0%**
Total	**11,916**	**100%**	**562,020**	**100%**	**3,544,272**	**100%**

Notes:
1. Private employee counts for the socioeconomic study area are based on an aggregate of values from the QCEW, 2015 for the following 2010 Census Tracts: 71, 75, 77, 119, 121, and 127.
2. The number of the private-sector employees in Brooklyn and New York City is equal to the average number of employees in 2015.
3. To avoid disclosing data for individual employers, study area employment estimates for certain sectors were not disclosed and are symbolized with an 'NA.' The total study area employment estimate does include employment not disclosed by sector; therefore, the percentage of employment by sector does not sum to 100 percent.
4. Includes Agriculture and Mining Sectors within the study area, as well as business and employee counts for sectors not listed due to disclosure concerns.
5. Employment percentages by sector may not add to totals due to data suppression and rounding.

* The Information sector comprises employees working in establishments engaged in (a) producing and distributing information and cultural products, (b) means to transmit or distribute these products and data or communications, and (c) processing data.

Sources: NYSDOL QCEW, 2015 data was provided at the census tract-level for the socioeconomic study area by DCP HEIP Division (February 2017).

In the study area, Health Care and Social Assistance, Accommodation and Food Services, Construction, and Retail are the sectors with the most employees. Combined, these four sectors account for almost 60 percent of study area private-sector employment. The economic sector with the highest employment in the study area was Health Care and Social Assistance, accounting for 27 percent of total private-sector employment. This is in line with the share of employment in this sector for Brooklyn (32 percent of private-sector employees in Brooklyn are within the Health Care and Social Assistance sector), but higher than for all of New York City (18 percent of private-sector employees in New York City are within the Health Care and Social Assistance sector).

The next-largest economic sector is the Retail Trade Sector. Approximately 12 percent of private-sector employees in the study area work in this sector. In all of Brooklyn, retail employment accounts for approximately 13 percent of private-sector employment, while 10 percent of all private-sector employment in New York City is within the Retail Trade sector. Within the study area, major national chains such as Whole Foods, Lowe's Home Improvement, and Staples have a strong presence and are complemented by many small businesses along 3rd Avenue and Smith Street.

The strong presence of the Accommodation and Food Service sector in the study area (10 percent of private-sector employment) is an indicator of recent developments. Over the past 10 years, a number of new hotels have located in the study area, including the LeBleu on 4th Avenue and the Fairfield Inn on 3rd Avenue. New restaurants and bars have caused employment in this sector to increase from approximately 200 employees in 2000 to approximately 1,200 employees in 2015.

The fourth-largest economic sector in the study area is the Construction sector, with approximately 10 percent of total private-sector employment. Its representation in the study area is larger than in Brooklyn (5 percent) and New York City (4 percent).

Two industry sectors—Transportation and Warehousing as well as Wholesale Trade —represent significantly higher levels of employment in the study area as compared with Brooklyn or New York City. The Transportation and Warehousing sector represents 8 percent of total study area private-sector employment, whereas in both Brooklyn and New York City, the sector represents 3 percent of private-sector employment. Employment in Wholesale Trade represents 7 percent of study area employment as compared with 4 percent in both Brooklyn and New York City. On the other hand, jobs in the Finance and Insurance Sector in the study area account for less than 1 percent of private-sector employment, while they represent 3 percent in Brooklyn and 9 percent in New York City.

Businesses

As of 2015, there were an estimated 993 private-sector businesses within the socioeconomic study area (see **Table 3-2**). While Healthcare and Social Assistance accounted for the largest share of private-sector employment in the study area (27 percent), the sector accounts for only 4 percent of the private-sector businesses. In contrast, service sector businesses dominated by small businesses account for the largest share of companies. Other Services firms, such as Repair and Maintenance, Private Household, and Personal Services represent approximately 16 percent of businesses present in the study area. Other typical small business sectors, such as Retail and Accommodation and Food Services, each represent 10 percent of total businesses.

Table 3-2
2015 Private-Sector Businesses in the Socioeconomic Study Area, Brooklyn, and New York City

	Study Area		Brooklyn		New York City	
	Firms	% of Total	Firms	% of Total	Firms	% of Total
Accommodation and Food Services	102	10%	4,805	8%	21,525	8%
Administrative and Support and Waste Management and Remediation Services	25	3%	1,841	3%	10,964	4%
Arts, Entertainment, and Recreation	34	3%	843	1%	5,666	2%
Construction	72	7%	3,672	6%	13,057	5%
Educational Services	24	2%	989	2%	4,020	2%
Finance and Insurance	9	1%	1,416	2%	11,976	5%
Health Care and Social Assistance	40	4%	6,188	11%	22,677	9%
Information*	37	4%	909	2%	6,406	2%
Management of Companies and Enterprises	-	NA	133	0%	1,463	1%
Manufacturing	47	5%	1,774	3%	5,766	2%
Other Services (except Public Administration)	154	16%	6,801	12%	35,407	14%
Professional, Scientific, and Technical Services	112	11%	4,630	8%	29,889	11%
Real Estate and Rental and Leasing	41	4%	4,328	7%	20,969	8%
Retail Trade	102	10%	9,269	16%	32,352	12%
Transportation and Warehousing	18	2%	1,301	2%	4,819	2%
Unclassified	-	NA	5,645	10%	17,866	7%
Utilities	-	NA	24	0%	70	0%
Wholesale Trade	71	7%	3,156	5%	15,194	6%
Other[4]	105	11%	13	2%	62	0%
Total	**993**	**100%**	**57,737**	**100%**	**260,148**	**100%**

Notes:
1. Private business establishment counts for the socioeconomic study area are based on an aggregate of values from the QCEW, 2015 for the following 2010 Census Tracts: 71, 75, 77, 119, 121, and 127.
2. The number of the private sector businesses in Brooklyn and New York City is equal to the average number of employees in 2015.
3. To avoid disclosing data for individual employers, study area business establishment estimates for certain sectors were not disclosed and are symbolized with an 'NA.' The total study area business establishments estimate does include establishments not disclosed by sector; therefore, the percentage of study area businesses by sector does not sum to 100 percent.
4. Includes Agriculture and Mining Sectors within the study area, as well as business and employee counts for sectors not listed due to disclosure concerns.

* The Information sector comprises establishments engaged in (a) producing and distributing information and cultural products, (b) means to transmit or distribute these products and data or communications, and (c) processing data.

Sources: NYSDOL QCEW, 2015 data was provided at the census tract-level for the socioeconomic study area by DCP HEIP Division (February 2017).

Locally serving retail businesses in the study area are concentrated along Court and Smith Streets in Carroll Gardens, where many of the area's restaurants and bars cater to a city-wide clientele. Localities on 3rd and 4th Avenue have stronger neighborhood focus, catering to the increasing residential population in new developments on 4th Avenue. The Gowanus area around the Canal is also home to many smaller businesses that are a reflection of the existing industrial nature of the area. Automotive repair shops, metal fabricators, and hardware stores are mainly found on 2nd and 3rd Avenues.

The strong representation of Professional, Scientific and Technical Services firms in the study area (11 percent) is an indication of the increasing influx of small design, engineering, and architecture firms and start-up enterprises.

CEQR PRELIMINARY ASSESSMENT CRITERIA

According to the *CEQR Technical Manual*, the following threshold indicators are considered to determine the potential for significant adverse impacts due to direct business displacement.

1. Do the businesses to be displaced provide products or services essential to the local economy that would no longer be available in their "trade areas" to local residents or businesses due to the difficulty of either relocating the businesses or establishing new, comparable businesses?

At the Head End Site, the Project would require the use of two lots (Block 418, Lot 1 and Block 411, Lot 24) for installation of the CSO Facilities, as well as a third lot (Block 425, Lot 1) for construction staging. At the Owls Head Site, the Project would require the use of five lots (Block 990, Lots 1, 16 and 21 and Block 977, Lots 1 and 3). The Project would require the displacement of all uses located on these lots (excepting the DSNY facility); currently, there are 19 businesses operating on the lots.

New York City's commercial streets are dynamic, with businesses regularly opening and closing in response to changes in the economy, local demographics, and consumer trends. Therefore, it is possible that a number of the potentially displaced businesses identified below would close or relocate for reasons independent of the Project. In addition, as noted in Chapter 2, "Land Use, Zoning, and Public Policy," DCP is currently conducting a comprehensive planning study of the Gowanus neighborhood in order to develop a future development framework for the area. However, the planning study is currently in the preliminary stages of receiving community input, and the framework for the future of the area is not known at this time. Therefore, for the purposes of a conservative assessment, it is assumed that the 19 businesses currently operating on lots associated with the Project would be displaced by the Project.

As shown in **Table 3-3**, there are an estimated 184 employees associated with the 19 businesses that could be directly displaced by the Project. These businesses, located on the Project Sites[2], span a range of sectors.[3]

[2] Businesses located on Head End Site: Sanitation Repairs Company; Brooklyn Truck and Equipment; A&A Electrical Contracting; Cole Partners Inc.; ZunZun; Abrams Industries Inc.; MRC II CONTRACTING, INC.; Auto Magic; Phoenix Services Corp.; Plumbing NYC Inc.; and Eastern Effects. Businesses located on Owls Head Site: Sunset International Foods; T&L State Distributers; Good Friend Beverages; Workspace 11; IC Industrial Inc.; Trace AV LLC/Trace Cosmetics; Spartan Dismantling Corp.; and Signature Auto Collision

[3] Field visits and research conducted following publication of the DEIS in January 2018 indicated that two of the identified businesses, Abram Industries and the Bridgerunner Motorcycle Club, are no longer occupying space at the Head End Site, discussed further below.

Table 3-3
Businesses Potentially Directly Displaced by the Project

Industry Sector	Firms	Percent of Displaced Businesses	Estimated Employment Displaced[1]	Percent of Displaced Employment
Construction	8	42%	82	45%
Manufacturing	1	5%	7	4%
Transportation and Warehousing	4	21%	26	14%
Professional Services	1	5%	12	6%
Other Services – Sub Sector: Automotive Repair and Maintenance	4	21%	22	12%
Information – Sub Sector: Motion Picture and Sound Recording Industries	1	5%	35	19%
Total	**19**	**99[3]**	**184**	**100**

Notes:
1. Employment estimates are based on field observations, standard industry employment density ratios commonly used for CEQR analysis, as well as employment estimates by business databases (i.e., Manta and Bloomberg). Where a range was provided the midpoint was used.
2. Businesses were classified based on their primary business function.
3. Percentage total does not add to 100 percent due to rounding error. In particular, each business in the Manufacturing, Professional Services, and Motion Picture and Sound Recording Industries represents 5.3 percent of total businesses. When the percentage for each sector is rounded down (from 5.3 percent to 5 percent), 0.3 percentage points are omitted.

Sources: AKRF, Inc.; DCP MapPLUTO 2016 data, Manta, and Bloomberg

Construction Sector

The sector with the largest number of potentially displaced employees is Construction, with an estimated 82 potentially displaced employees. It is also the sector with the largest number of potentially displaced firms (i.e., eight firms), which include: A&A Electrical Contracting; Cole Partners Inc; ZunZun; MRC II CONTRACTING, INC.; Phoenix Services Corp.; Plumbing NYC Inc.; IC Industrial Inc.; and Spartan Dismantling Corp. Six of these construction firms are located on one of the two parcels that would house the CSO Facility at the Head End Site (Block 418, Lot 1); the two other potentially displaced construction firms are located on the Owls Head Site (Block 990, Lots 16 and 21).

The eight potentially displaced Construction Sector businesses represent approximately 11 percent of Construction businesses, and 7 percent of Construction employment in the study area. Four of the businesses (Cole Partners Inc., MRC II CONTRACTING, INC., Phoenix Services Corp., and Spartan Dismantling Corp) are general construction contractors who do not specialize on a particular subject or craft. The remaining four construction firms are specialized contractors and focus either on electrical, plumbing or carpentry work (i.e., A&A Electrical Contracting, ZunZun, Plumbing NYC Inc., and IC Industrial Inc.). Within a two-block distance of the Canal there are a number of both general contractors and specialized contractors that provide a comparable alternative service as the displaced businesses, including Burda Construction Corporation (general contractor), Arnell Construction Corporation (general contractor), Monadnock Construction Inc. (general contractor), Blue Ribbon Electrical Contractors (electric contractor), Easy Street Plumbing Inc. (plumbing contractor), and Heights Woodworking (carpentry construction). Within the study area as a whole, there are an estimated 64 other Construction Sector businesses (excluding the eight potentially displaced businesses).

Other Services Sector—Automotive Repair and Maintenance

Displaced Other Services businesses, which only include Automotive Repair and Maintenance shops, are: Sanitation Repairs Company; Brooklyn Truck and Equipment; Auto Magic; and Signature Auto Collision. With the exception of Signature Auto Collision, all vehicle parts dealers and repair businesses are located at the Head End Site. These businesses represent 3.0 percent of businesses and 3.5 percent of employment within the Other Services Sector in the study area. The potentially displaced businesses and associated employment do not represent a majority of study area retail businesses or employment. Comparable services and employment opportunities would still be available within the study area. Both 3rd and 4th Avenues are well known for automotive repair and service businesses. Currently there are more than 20 automotive repair businesses located between the Canal and 4th Avenue, including Pep Boys Auto Parts and Services, ABC Collision, Holy Land Auto Repair, and Ferraro Body and Fender Shop. In addition, there many more automotive repair shops on 3rd and 4th Avenues just south of the study area.

Transportation and Warehousing & Wholesale Trade Sectors

The potentially displaced Warehousing and Transportation firms are: Sunset International Foods; T&L State Distributers; Good Friend Beverages; and Trace AV LLC/Trace Cosmetics. All Warehousing and Transportation firms are located on lots associated with the Owls Head Site, and all locations are used to store and distribute primarily non-durable goods (food and beverages). The Owls Head Site is less than one mile from the Brooklyn Queens Expressway (BQE) ramp at Prospect Avenue and 3rd Avenue. The potentially displaced businesses are on the smaller end of the spectrum of Transportation and Warehousing & Wholesale Trade Sector businesses. These businesses represent 4.5 percent of businesses and 1.0 percent of employment within the two sectors in the study area.

Manufacturing Sector

One Manufacturing Sector business on the Proposed Sites would be displaced: Abram Industries Inc.[4] This business is a small-sized manufacturing company employing approximately seven employees and is classified as a Miscellaneous Manufacturer. It represents 2 percent of businesses and 1 percent of employment within the Manufacturing Sectors in the study area.

Professional Services Sector

Workspace11 is a design, engineering and fabrication firm that specializes in architectural metal installations. The company, which could be displaced by the Project, is a hybrid between a professional services and a specialized manufacturing firm and is typical of the new businesses that have been locating within the Gowanus area. Such firms are part of the maker economy creating customized products and services for businesses and residential customers. The arrival of the Gowanus Studio Space—an emerging-artist complex with gallery and studio spaces, plus woodworking, printmaking and metal shops, and Craftsman Ave—a workshops space for artists and craft workers in the study area—are an indication of the changing nature of businesses moving to the area. In 2015, there were 112 professional services firms in the study area employing 423 employees. Workspace11 represents 1 percent of the study area's Professional Services Sector businesses and about 3 percent of sector employment in the study area.

Information Sector—Motion Picture and Sound Recording Industries

The single-largest potentially displaced business, which also has the most employees, is Eastern Effects—a Motion Picture and Sound Recording company occupying the entirety of Lot 1 on Block 425 (the location of the construction staging area for the Head End Site). Eastern Effects is estimated to employ 35 workers.

[4] Field visits and research conducted following publication of the DEIS in January 2018 indicated that Abram Industries is unlikely to be operating on the Head End Site. While information on the business is available on online data sources, field visits and attempts to contact Abram Industries did not provide any indication that the business operates in this location. However, for consistency with the DEIS, the business is still included in the calculations for the analysis.

In 2015, there were a total of 37 Information Sector businesses recorded for the study area, 26 of which were in the Motion Picture and Sound Recording Industries. All Information Sector businesses employed a total of 293 employees, while firms in the Motion Picture and Sound Recording Industries employed a total of 73 employees. Accordingly, Eastern Effects represents 4 percent of businesses and 48 percent of employment within the subsector (Motion Picture and Sound Recording Industries) in the study area. It is the largest of the 26 study area businesses within this industry subsector.

Motion Picture and Sound Recording Industries Sector businesses do not produce products and services that are primarily consumed by the study area population. Instead, businesses in this subsector are part of a larger supply chain that serves a national or even international market. Once produced, movies and other entertainment products are likely to be prepared for distribution outside of the studio's current location. Local businesses and residents would still be able to consume the movies and other entertainment products generated by Eastern Effects even after the business relocates**.**

There are also two not-for-profit businesses located on the Project Sites–Bridgerunner Motorcycle Club[5] occupies space in the building at the Head End site, on Block 424, Lot 24, and the Gowanus Canal Conservancy uses space for activities on a portion of the Owls Head Site (Block 977, Lot 3, which also contains the DSNY facility).

In summary, the 19 potentially displaced businesses do not represent a majority of study area businesses or employment for any given sector. While all businesses contribute to neighborhood character and provide value to the City's economy, alternative sources of goods, services, and employment are available within the socioeconomic study area or a reasonably proximal trade area.

2. Is the category of businesses or institutions that may be directly displaced the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it?

The Project would potentially directly displace 19 businesses, which consist mainly of Construction and Transportation and Warehousing & Wholesale Trade Sector businesses, all of which are abundant within the study area, Brooklyn, and New York City. Of the 19 potentially displaced businesses, 18 are within business categories that are not the subject of regulations or publicly adopted plans to preserve, enhance, or otherwise protect them. As noted above, Eastern Effects is within the Motion Picture and Sound Recording Industry, for which New York State provides tax incentives in order to attract movie productions[6] to the City and State. However, the incentive program does not target this particular study area, and as discussed in the specific industry effects assessment below, the displacement of this use would not have the potential to jeopardize the viability of the movie production industry city-wide.

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[5] Field visits conducted following publication of the DEIS in January 2018 found that the Bridgerunner Motorcycle Club is no longer occupying space at the Head End Site. The vacated space is now occupied by Spoke The Hub, a community dance company. According to the dance company, it is temporarily using space on the second floor of the Head End Site while its studio at 295 Douglass Street in Brooklyn is undergoing reconstruction (https://spokethehub.org/meet-the-new-sth-hub-arts-annex/). It is assumed that the ratio of employees to floor area is 1 employee per 1,000 square feet of community facility space, which would result in approximately two full-time employees employed by Spoke the Hub on the site. Since the employment would only account for less than 0.1 percent of the total study area employment and the temporary facility does provide products or services essential to the local economy that would no longer be available to local residents or businesses in their "trade areas," its displacement would not constitute a significant impact.

[6] Movie production companies may be eligible to receive a fully refundable credit of 30 percent of qualified production and post-production costs incurred in New York State.

All project area sites at the Owls Head area are within the Southwest Brooklyn Industrial Business Zone (IBZ), which was created to protect industrial businesses from being displaced by residential uses. IBZs do not protect specific industry sectors or uses; they rather ensure that zoning regulation for lots within these areas remain unchanged.[7] Since the Project would not seek a change in zoning it does not conflict with the statutes of the IBZ.

Overall, based on the analysis presented above and *CEQR Technical Manual* impact thresholds, the Project would not result in significant adverse impacts due to direct business displacement. The businesses that would be directly displaced by the Project do not provide products or services essential to the local economy that would no longer be available in their trade area; and the displaced businesses produce for a market that is much larger than the study area. The motion picture subsector produces for a national or even international market and uses distribution channels (i.e., broadcasting and Internet) that reach far beyond the ¼-mile study area. The Construction Sector serves areas located primarily outside the study area, where construction activity is highest and the sector's services are needed the most, including downtown Brooklyn, Williamsburg, Hudson Yards in Manhattan, Long Island City in Queens and other areas throughout the City. All lots at the Owls Head staging site are part of an area where industrial uses are intended to be maintained (i.e., IBZ). Since the Project would not change the use on these properties it would not conflict with current IBZ policies. Finally, there is no category of business that would be directly displaced by the Project that is the subject of New York City regulations or plans to preserve, enhance, or otherwise protect it.

INDIRECT BUSINESS DISPLACEMENT

In most cases, indirect displacement of businesses occurs when a project would markedly increase property values and rents throughout an area, making it difficult for some categories of businesses to remain in the area. This is not a concern with the Project, because it is not introducing a substantial new use to the area that could substantially alter or accelerate existing market trends. Rather, the concern is whether the Project would directly displace a use that either directly supports businesses in the area or brings a customer base to the area for local businesses, or if it would directly or indirectly displace workers who form the customer base of existing businesses in the area.

Eastern Effects operates a studio facility used to produce movie and TV segments. The 70,000-square-foot space represents one of about 50 movie studio facilities in New York City. While the Project could directly displace only one business from the Motion Picture and Sound Recording Industries Sector (Eastern Effects), the business is the largest of the 26 study area businesses within this industry subsector, employing an estimated 35 of the 73 study area workers in the subsector. The remaining movie production businesses are estimated to employ a total of 38 employees or approximately 1.5 employees per company. This difference in employee size is typical for the film and movie industry. Only studios employ a larger amount of employees. Other companies within the industry's value chain typically focus on only one specific task in the production process (e.g., sound recording, editing, etc.), work on a contract basis for a range of productions produced in different studio locations, and tend to be much smaller in size. The concentration of many smaller sector businesses in the vicinity of the larger Eastern Effects business suggests the possibility that the smaller businesses in the study area may be part of its value chain, and some may depend on its location within the study area for their viability. It is therefore possible that some of these smaller businesses may not be viable once the larger firm relocates. However, even if all of the 26

[7] New York City Industrial Business Zones: https://www.nycedc.com/industry/industrial/nyc-industrial-business-zones

businesses within this subsector were to be displaced, it would not result in significant adverse socioeconomic impacts, as described below.

Given the diverse nature of the movie industry, with a number of locations across New York City, many of the smaller businesses are likely to work on several movie productions for a variety of different studios. Because the movie production process is highly specialized, individual tasks, for example film editing and distribution, are contracted to a range of individual firms who are only involved in certain stages of the production process. The fragmented nature of the production process requires individual firms to work on a number of productions over any given period in order to fully utilize their staff and equipment and to remain profitable.

In the event of the direct displacement of Eastern Effects from its study area location, many of the smaller movie production sector businesses are likely to refocus their resources and provide services to a different studio. The current growth trend in the industry in New York City and a shortage of technical support firms substantiate this assumption.

Displacement of some or even all of these potentially dependent business uses would not result in a significant loss of employment within the study area. As mentioned above, the employment associated with all other study area businesses in this sector is an estimated 38 workers (not including Eastern Effects employment), representing only 0.3 percent of total study area employment. In addition, the study area is economically vibrant and includes strong commercial and residential markets, such that one could expect the properties in the surrounding area to be re-tenanted with other uses and new workers and/or residents who would contribute to the local economy.[8] Accordingly, the potential indirect displacement of these uses would not create a broader climate of disinvestment in the study area.

As discussed in the direct business displacement analysis, the local population (residents) and non-movie-production businesses in the study area are not dependent on movie production sector businesses and their employees staying in their current location. Businesses depending on the local customer base will still be able to draw from the larger existing pool of other businesses and residents.

As assessed in the “Adverse Effects on Specific Industries” section below, the direct displacement of Eastern Effects from the Project Site is not anticipated to have a significant adverse impact on the Motion Picture and Sound Recording Industries Sector City-wide.

ADVERSE EFFECTS ON SPECIFIC INDUSTRIES

According to the *CEQR Technical Manual*, a significant adverse impact may occur if a project would quantifiably diminish the viability of a specific industry that has substantial economic value to the City’s economy. The following threshold indicators are considered.

1. Would the proposed project significantly affect business conditions in any industry or any category of business within or outside the study area?

As described in the direct business displacement analysis above, the Project would directly potentially displace an estimated 19 businesses and 184 employees. The businesses include: Cole Partners Inc., MRC II CONTRACTING, INC., Phoenix Services Corp., Spartan Dismantling Corp., A&A Electrical Contracting, ZunZun, Plumbing NYC Inc., IC Industrial Inc., Sanitation Repairs Company, Brooklyn Truck and Equipment, Auto Magic, Signature Auto Collision, Sunset International Foods, T&L State

[8] For example, the redevelopment at 255 Butler Street includes plans to develop creative office space at the site, indicating a continued demand for office and maker space in the Gowanus area.

Distributers, Good Friend Beverages, Trace AV LLC/Trace Cosmetics, Abram Industries Inc.[9], Workspace11, and Eastern Effects.

The businesses that would be displaced do not represent a critical mass of businesses within any City industry or category of business. Within and outside the study area there would remain a large number of firms within the three sectors with the largest number of potentially displaced businesses (as shown in **Table 3-2**, Construction, Transportation and Warehousing, and Other Services/Motor Vehicle Repair Shops). The services these businesses provide (primarily general contracting and motor vehicle repair) can be absorbed in neighboring areas, such as Sunset Park, where a large number of these sector businesses are already located. Farther south, south of 9th Street and outside of the study area but still within their trade area, more industrially zoned land is available with lower rents as compared with rents in the study area.

The remaining three business sectors (Manufacturing, Professional Services, and Information/Motion Picture and Sound Recording Industries) would each experience the displacement of one business. With approximately 7 employees, according to Manta, Abraham Industry is considered a small construction business. Workspace 11 is a manufacturing and assembly business that occupies a single building and employs approximately 12 employees. The capacities of Abram Industries and Workspace 11 are limited and would not affect business conditions in any industry or any category within or outside of the study area.

Eastern Effects' 70,000-square-foot space represents one of about 50 movie studio facilities in New York City. Given the considerable number of studios in New York City and the ability of locating studios as of right in areas where it is allowed by zoning, in particular areas zoned for commercial or manufacturing uses within the City (e.g., Eastern Effects has another studio in a similarly zoned area located in the East New York neighborhood of Brooklyn and other movie production facilities are located in similarly zoned areas at the Brooklyn Navy Yard and in Western Queens), displacing the studio space would not significantly affect business conditions in the Motion Picture and Sound Recording Industry Sector.

Although all of the businesses are valuable individually and collectively to the City's economy, the goods and services offered by most potentially displaced uses (i.e., Construction, Manufacturing, Transportation and Warehousing, and Professional Services) can be found elsewhere within the socioeconomic study area, within a broader trade area, and within New York City as a whole. The products and services offered by these businesses are not expected to be essential to the viability of other businesses within or outside the study area.

The displacement of the Motion Picture and Sound Recording Industries Sector business has the potential to affect the viability of this particular industry subsector within the study area. However, as indicated above, motion picture businesses are located throughout the City (e.g., in Midtown Manhattan, in the Brooklyn Navy Yard, in the Kaufman and Silvercup Studios in Astoria, Queens, and in East New York). Also, many of the smaller businesses in the sector that are sub-contractors to larger production facilities typically offer their services to multiple facilities/studios in different locations. Further, for supporting businesses such as editors and other post-production businesses, it is not necessary to be in close proximity to the production site since files can be shared digitally.

Based on the information and analysis presented above, the Project would not quantifiably diminish the viability of a specific industry that has substantial economic value to the City's economy.

[9] As noted above, field visits and research conducted following publication of the DEIS in January 2018 indicated that Abram Industries is unlikely to be operating on the Head End Site.

2. Would the proposed project indirectly reduce employment substantially or have an impact on the economic viability of the industry or category of business?

As described in the indirect business displacement analysis, the Project would not result in significant indirect business displacement. Therefore, the Project would not indirectly reduce employment substantially or have an impact on the economic viability of any specific industry or category of business.

Overall, based on the preliminary assessment summarized above, the Project would not result in significant adverse impacts due to adverse effects on specific industries.

E. CONCLUSION

Overall, the Project would not result in any significant adverse socioeconomic impacts. Due to the evolving characteristics of the study area including existing development forces and the proposed benefits the Project may have on the Canal, indirect effects on rents and property values may occur in the study area that cannot be reflected/quantified in this analysis.

Individually and collectively, the 19 businesses that could be directly displaced do not provide products or services essential to the local economy that would no longer be available to local residents or businesses in their “trade areas” due to the difficulty of either relocating the businesses or establishing new, comparable businesses. The 19 businesses are also not a category of businesses or institutions that may be the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it. Their displacement would not significantly affect business conditions in any industry or any category of business within or outside the study area. ✷

Chapter 4: Community Facilities and Services

A. INTRODUCTION

Community facilities and services are defined in the 2014 *City Environmental Quality Review (CEQR) Technical Manual* as public or publicly funded schools, child care centers, libraries, health care facilities, and fire and police protection services. The CEQR analysis methodology focuses on direct effects to community facilities, such as when a facility is physically displaced or altered, and on indirect effects, which could result from increased demand for community facilities and services generated by new users, particularly a new residential population.

B. SCREENING ASSESSMENT

The Project would not have a direct effect on community facilities because neither the Head End Facility nor the Owls Head Facility would physically displace any on-site community facilities. As discussed in Chapter 1, “Project Description,” a portion of the Owls Head Site currently contains a New York City Department of Sanitation (DSNY) facility that includes a road salt storage yard and space for storage of snow plows, which would be accommodated on the site along with the Owls Head Facility. In addition, the DSNY-controlled portion of the Owls Head Site is also used periodically by a local non-profit environmental group, the Gowanus Canal Conservancy (GCC), for environmental education and stewardship events, including composting operations. During construction of the Owls Head Site the DSNY’s road salt and plow storage may be relocated within a portion of the site and therefore would not be adversely affected by the Project. While access to the composting facility and GCC activities may be displaced during construction, once the Owls Head Facility is operational, access for these activities could be restored and therefore would not be adversely affected by the Project. Further, the Project would not result in new residential development and would not introduce a new residential population to the study areas that could result in indirect effects by increasing demand for community facility services. Therefore, the Project would not have a significant adverse impact on community facilities, and no further analysis is necessary. ✷

Chapter 5: Open Space

A. INTRODUCTION

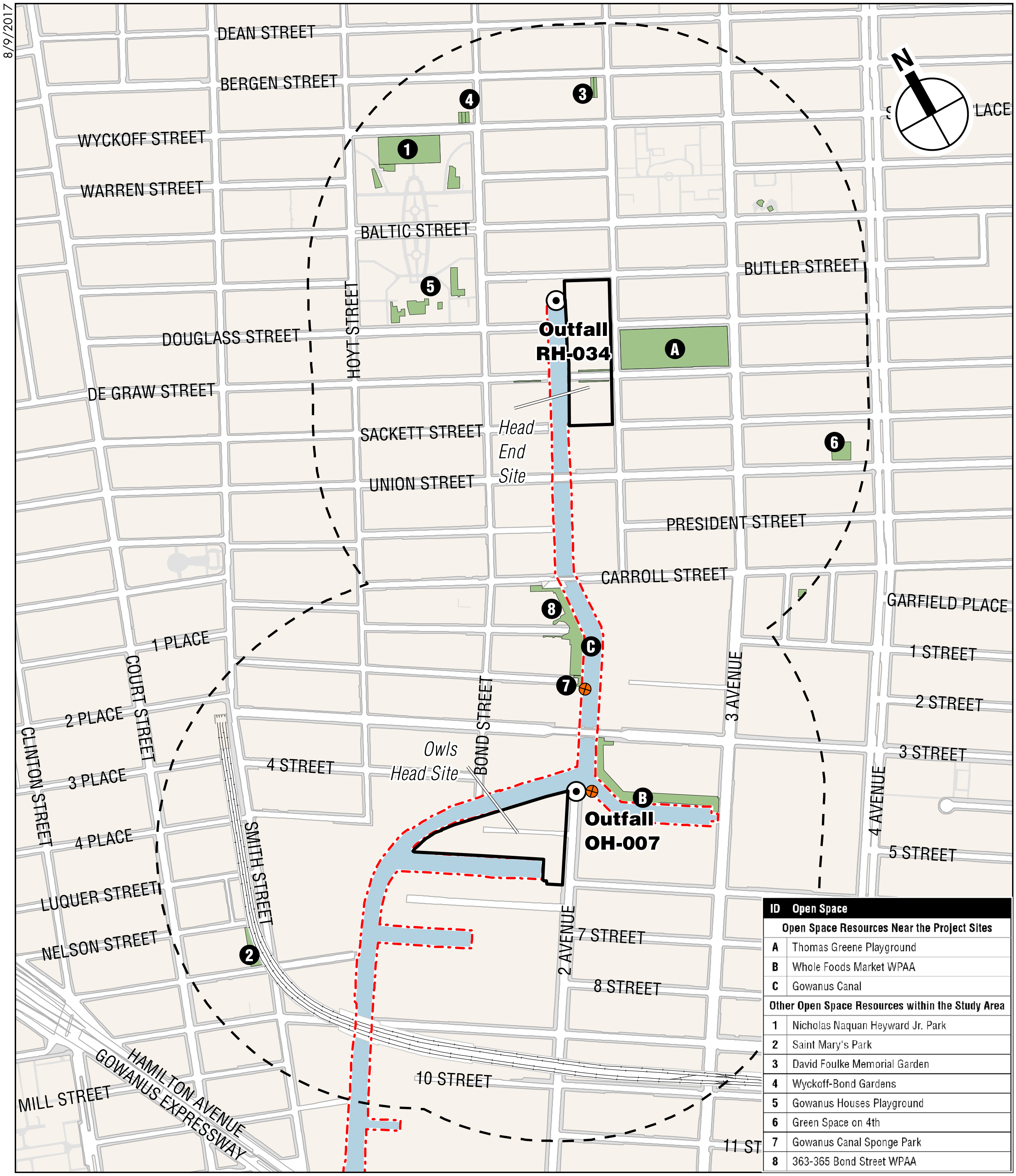
Open space is defined by the 2014 *City Environmental Quality Review (CEQR) Technical Manual* as publicly or privately owned land that is accessible and available for leisure, play, or sport, or serves to protect or enhance the natural environment. According to the *CEQR Technical Manual*, an open space assessment is recommended if a project would have a direct effect on open space, such as eliminating or altering a public open space, or an indirect effect on open space, such as when a new population overburdens available open space. The Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) includes the construction and operation of CSO facilities at two sites along the Gowanus Canal which may result in direct effects on adjacent open spaces. This chapter considers the Project's direct effects on open space resources resulting from the operation of the CSO Facilities, including potential increases in noise, air pollutants, odors, and shadows from the Project on adjacent public open spaces. The Project would not introduce a new residential or non-residential population to the Gowanus neighborhood that could potentially burden existing open space resources; therefore, an indirect effects analysis of open space is not warranted.

B. METHODOLOGY

A direct effect on an open space would occur if a project would (1) cause the physical loss of public open space; (2) change the use of an open space so that it no longer serves the same user population; (3) limit public access to an open space; or (4) cause increased noise or air pollutant emissions, odors, or shadows that would affect the usefulness of open space, whether on a permanent or temporary basis.

The Project Sites and construction staging areas do not contain any public open spaces. The Owls Head Site is used periodically by a local non-profit group, the Gowanus Canal Conservancy (GCC) for educational and community programs. However, it does not contain any permanent recreational amenities, and is not open to the public regularly; therefore this facility is not considered a publicly accessible open space. The Project would not result in the physical loss of publicly accessible open space, would not result in any alterations to open spaces, and would not limit public access to open spaces in the study area. However, as shown on **Figure 5-1**, the Head End Facility would be located adjacent to the Thomas Greene Playground and the Owls Head Facility would be located near the Whole Foods Market waterfront public access area (WPAA); both the Thomas Greene Playground and the Whole Foods WPAA adjacent to the Project Sites are considered public open spaces. Therefore, operation of the Project has the potential for permanent direct effects resulting from potential increases in noise, air pollutants, odors, and shadows on these open space resources. In addition, both facilities would be constructed along the Gowanus Canal which, as discussed further below, is used by recreational boaters; the end of 2nd Avenue, near the Owls Head Site, is used by recreational boaters as an access point to the water (another launch for recreational boats is located on the west side of the Canal in between the Project Sites at the Gowanus Canal Sponge Park, discussed further below). Therefore, operation of both facilities would have the potential for direct effects on limiting public access to this resource as well.

8/9/2017



ID	Open Space
	Open Space Resources Near the Project Sites
A	Thomas Greene Playground
B	Whole Foods Market WPAA
C	Gowanus Canal
	Other Open Space Resources within the Study Area
1	Nicholas Naquan Heyward Jr. Park
2	Saint Mary's Park
3	David Foulke Memorial Garden
4	Wyckoff-Bond Gardens
5	Gowanus Houses Playground
6	Green Space on 4th
7	Gowanus Canal Sponge Park
8	363-365 Bond Street WPAA

Project Sites
Study Area (Quarter-mile radius of project sites)
Open Space
Outfall Locations
Gowanus Canal
Launch/Canal Access for Recreational Boats

0 1,000 FEET

Open Spaces
Figure 5-1

As discussed in Chapter 20, “Construction,” temporary increases in noise and air pollutant emissions during construction of the Project could also potentially directly affect the Thomas Greene Playground, the Whole Foods Market WPAA, and the Gowanus Canal recreational resource.

This open space analysis identifies the existing open space areas that would be directly affected by the Project and describes their characteristics, features, and context. The analysis also considers additional existing open spaces within a ¼-mile radius of the Project Sites in order to assess the overall availability of open space resources for area residents (see **Figure 5-1**).These additional open space resources are considered qualitatively to determine whether there are comparable open space resources in the area that would not be directly affected by the Project and could accommodate the needs of residents. A field survey was conducted in good weather during the day in the month of May 2017 to characterize the existing uses and conditions of the open space areas.

The analysis then describes the future conditions in the 2028 analysis year without the Project (the Future Conditions in the Analysis Year) to establish the baseline against which the probable impacts of the Project are assessed. The Project’s direct effects on existing adjacent open spaces and recreational resources, including the Canal, are discussed.

As described in Chapter 1, “Project Description,” it is anticipated that some type of publicly accessible open space or waterfront access would be developed as part of the Project. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies, including review by New York City Parks and Recreation (NYC Parks). This project-generated open space cannot be significantly impacted by the Project because without the Project, the open space would not exist. If implemented, the project-generated open space would be a benefit to the open space resources in the study area. Therefore, it is not considered as part of the determination of significant adverse impacts to open space.

C. DIRECT OPEN SPACE IMPACTS ANALYSIS

EXISTING CONDITIONS

PUBLIC OPEN SPACES

The Thomas Greene Playground, a public open space operated by NYC Parks, is located east of the Head End Site on the block bounded by Douglass Street, 3rd Avenue, Degraw Street, and Nevins Street and is approximately 2.5 acres (see **Figure 5-1**). The area within the park along Nevins Street closest to the Head End Site contains four handball courts as well as a public pool (the Douglass and Degraw Pool), which includes a comfort station and changing rooms. In the midblock area, the park contains a paved area with basketball courts. The eastern end of the park, furthest away from the Head End Site, contains a playground and seating areas. The playground has a moderate utilization level[1] and is in good condition. The other areas of the Thomas Greene Playground had lower level of utilization at the time of the survey, although these areas of active recreation are more heavily utilized during the summer (i.e., the Douglass and Degraw Pool is generally only open to the public between the end of June and the beginning of September) and for periodic community events throughout the year.

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[1] The *CEQR Technical Manual* describes moderate utilization as 25 to 75 percent capacity utilization at peak hour, meaning that some passive spaces such as seating and/or active facilities such as playground equipment are available for use within the open space.

The Whole Foods Market WPAA is a 40-foot-wide public esplanade that wraps around the Whole Foods Market building and parking lot along the Gowanus Canal at 3rd Street and 3rd Avenue, opposite the Owls Head Site across the Fourth Street turning basin (see **Figure 5-1**). The esplanade has passive recreational uses, including tables and chairs, a small grassy area, planting areas, benches, and a bike rack. The esplanade has a low utilization (25 percent capacity or less utilization at the peak hour) and is in good condition.

There are additional public open spaces available to area residents within the ¼ mile study area. In particular, the New York City Housing Authority (NYCHA) Gowanus Houses residential complex (to the west of the Head End Site) contains the Nicholas Naquan Heyward Jr. Park, which includes a playground, a comfort station, walkways, a seating area, and basketball courts. Another playground is located on the southern portion of the Gowanus Houses campus. Other open spaces in the study area include Saint Mary's Park (operated by NYC Parks) located west of the Canal underneath the elevated subway tracks, which is currently closed for renovations with an anticipated completion date of spring 2018. The Gowanus Canal Sponge Park, recently constructed to capture and absorb stormwater runoff before it enters the Canal, is a small planted area with seating located on the western side of the Canal at the foot of 2nd Street. In addition, a new approximately 0.8-acre WPAA which includes a waterfront esplanade was recently completed on the west side of the Canal between 2nd Street and Carroll Street, to the north of the Gowanus Canal Sponge Park, as part of a large-scale development at 363-365 Bond Street. As shown on **Figure 5-1**, the remaining open spaces are generally small community gardens.

GOWANUS CANAL

In addition to the public open spaces described above, the Gowanus Canal itself is a recreational resource that is used by the surrounding community for active recreational activities such as fishing and boating.[2] In particular, a small boat launch is located at the end of 2nd Street on the western side of the Canal, within the Gowanus Canal Sponge Park**.** At the end of 2nd Avenue, adjacent to the Owls Head Site, a path through the bulkhead provides another access point to the water that is used by recreational boaters.

FUTURE CONDITIONS IN THE ANALYSIS YEAR

As discussed in Chapter 1, "Project Description," under a New York State Department of Environmental Conservation Record of Decision (NYSDEC ROD) administered in July 2015, the investigation and remediation of upland sources of contamination relating to the former Fulton Municipal Works manufactured gas plant site are currently being addressed pursuant to administrative orders under the jurisdiction of NYSDEC in coordination with the remediation required under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). The Thomas Greene Playground is within National Grid's NYSDEC-directed Remedial Investigation study area. Pursuant to the NYSDEC ROD, National Grid may be required to undertake remediation activities within the Thomas Greene Playground and, according to the Settlement Agreement issued on June 9, 2016 by the United States ~~Department of~~ Environmental Protection Agency (USEPA), a timely removal action must be implemented at the Thomas Greene Playground.[3] The Settlement Agreement also determined that the

[2] Waters in the Gowanus Canal are classified as either Use Class SD (upper section) or Use Class I (lower section), per the Water Quality Classifications, NYS Department of Environmental Conservation, Division of Water, Bureau of Water Assessment and Monitoring. The best usage of Class SD waters is fishing. The best usage of Class I waters is secondary contact recreation which includes, but is not limited to, fishing and boating.

[3] Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery, June 9, 2016, United States Department of Environmental Protection Agency.

cleanup of the park, including the siting and construction of a temporary park and restoration of the park by National Grid, may be subject to a future enforcement order between USEPA and National Grid, and in coordination with NYSDEC. As a result of the Settlement Agreement, and independent of the Project, portions of Thomas Greene Playground may be closed for extended periods. National Grid would be required to site and construct temporary park space to replace any park areas closed for remediation activities, and to restore any areas of the Thomas Greene Playground disturbed during remediation. The areas of the park that would be closed and the phasing of the remediation and subsequent restoration, as well as the location of the temporary replacement park space, are not known at this time.

In addition, USEPA and NYSDEC have mandated clean-up activities in the area of the Canal independent of the Project, including the installation of containment/cutoff walls, the excavation or stabilization of contamination on parcels along the Canal, the dredging of the Canal, the restoration of the 1st Street and 4th Street turning basins, and the installation of coal tar extraction wells. These remediation activities within the Canal may temporarily limit access for recreational boaters.

No changes are expected to be made to the other existing open spaces within the study area, including the Whole Foods Market WPAA. As noted above, Saint Mary's Park is undergoing renovations and is expected to reopen before the 2028 analysis year.

PROBABLE IMPACTS OF THE PROJECT

PERMANENT/OPERATIONAL DIRECT EFFECTS ON PUBLIC OPEN SPACES

As noted above, the Project Sites and construction staging areas are not located on any open spaces. Therefore, the Project would not displace or limit access to any existing open space. As discussed in Chapter 1 "Project Description," under the Administrative Settlement Agreement issued by the USEPA, under certain specified circumstances, the USEPA retains the discretion to direct the City to construct the Head End Facility at the Thomas Greene Playground. Under this alternative, construction of the Head End Facility would result in temporary closures of the Thomas Green Playground, as well as a permanent loss of area within the Playground to accommodate the facility. The effects of the alternative facility at the Thomas Greene Playground on open space and recreational resources in the area are discussed in Chapter 22, "Alternatives."

As described later in the EIS, operation of the Project would not result in any significant adverse noise, air quality, or shadows impacts affecting any open space resources (see Chapter 6, "Shadows"; Chapter 15, "Air Quality"; and Chapter 17, "Noise"). Specifically, the Project would not generate sufficient traffic to cause a significant increase in noise levels at the nearby open spaces, and the facilities' mechanical systems (i.e., ~~emergency generators, ~~odor control systems, pumps, etc.) would meet all applicable noise regulations and would avoid producing noise levels that would result in any significant increases in ambient noise levels. Further, this equipment would be located either indoors or below-grade without line of sight to nearby sensitive receptors, including open space. Therefore, there are no potential significant adverse noise impacts from the Project's stationary sources on the Thomas Greene Playground or the Whole Foods Market WPAA (see Chapter 17, "Noise").

Similarly, the Project would not alter traffic conditions enough to cause significant mobile-source air quality impacts at nearby open spaces. The Project's heating, ventilating, and air conditioning (HVAC) systems ~~and emergency generators ~~would not result in any significant adverse air quality impacts, and odor control systems would be installed to minimize odors. Therefore, operation of the Project would not result in any significant adverse air quality impacts on the Thomas Greene Playground and the Whole Foods Market WPAA (see Chapter 15, "Air Quality").

As discussed in Chapter 6, “Shadows,” the Head End Facility would not result in any shadows on the Thomas Greene Playground, as the Playground is located too far south to experience project-generated shadows from the above-grade structure. Similarly, shadows from the Owls Head Facility would extend over the Canal, but would not be long enough to reach the opposite side of the 4th Street turning basin; therefore; shadows from the Owls Head Facility above-grade structure would not affect the Whole Foods Market WPAA.

PERMANENT/OPERATIONAL DIRECT EFFECTS ON THE GOWANUS CANAL

At the Owls Head Site, construction of the CSO Facility along 2nd Avenue would include reconstruction of the bulkhead, which may extend to the area at the end of 2nd Avenue that currently contains an access point to the Canal for boaters. Therefore, the bulkhead improvement at this location may result in the loss of the access path to the Canal. However, following the construction of the Owls Head Facility, space on the Owls Head Site could be made accessible to GCC, and this space may allow for a new access point to the water. In addition, access to the Canal would remain available in the area from the launch in the Gowanus Canal Sponge Park, which would not be affected by the Project. Therefore, the Project would not result in a significant loss of access to the Canal for boaters or otherwise affect the usefulness of the Canal as a recreational resource.

As discussed in Chapter 17, “Noise,” the Project would not generate sufficient traffic to cause a significant increase in noise levels at the Canal, and the Facilities’ indoor or below-grade mechanical systems would meet all applicable noise regulations and would avoid producing noise levels that would result in any significant increases in ambient noise levels. Therefore, there are no potential significant adverse noise impacts to the Canal from the Project’s stationary sources.

Similarly, the Project would not alter traffic conditions enough to cause significant mobile-source air quality impacts, there would be no significant adverse air quality impacts from the Project’s stationary HVAC systems~~ and emergency generators,~~ and odor control systems would be installed to minimize odors. Therefore, operation of the Project would not result in any significant adverse air quality impacts on the Canal (see Chapter 15, “Air Quality”).

As discussed in Chapter 6, “Shadows,” while both Facilities would result in incremental shadows falling on small areas of the Canal adjacent to the sites, the limited areas of incremental shadows would not substantially affect recreational use of the Canal. Large areas of the Canal adjacent to the area affected by incremental shadows would continue to receive direct sunlight and be available to users. Therefore, there would be no significant adverse shadows impacts to the recreational uses of the Canal.

CONCLUSION

Overall, the Project would not result in the permanent loss of or alteration to any existing open space, and operation of the Project would not result in any permanent effects from noise, air pollutants, odors, or shadows which would adversely affect the usefulness of the adjacent open spaces or recreational resources. In particular, public enjoyment of the Thomas Greene Playground, the Whole Foods Market WPAA, and the Gowanus Canal would not be adversely affected. Furthermore, at the Head End Site, it is anticipated that some type of publicly accessible open space would be developed as part of the Project; as noted above, the surface layout of the Head End Site is currently being designed and public access areas provided on the site will be determined through additional facility design in consultation with the local community and other City agencies, including NYC Parks. The analyses of the Project’s effects on this Project-generated open space concluded that there would be no significant adverse impacts from shadows, air pollutant emissions, odors, or noise (see Chapter 6, “Shadows”; Chapter 15, “Air Quality”; and Chapter 17, “Noise”). DEP is also evaluating the potential for the site to include accessible waterfront open space at the Owls Head Site where it does not interfere or conflict with the operation of the Owls Head Facility.

Therefore, the operation of the Project would result in open space improvements to the area, and would not result in any significant adverse direct impacts on open space. The Project's effects on nearby open spaces during construction of the CSO Facilities, including effects on open space resulting from increased noise, air pollutants, odors, and construction-related traffic, are discussed in Chapter 20, "Construction." ✷

Chapter 6: Shadows

A. INTRODUCTION

Shadow is defined in the 2014 *City Environmental Quality Review (CEQR) Technical Manual* as the condition that results when a building or other built structure blocks the sunlight that would otherwise directly reach a certain area, space, or feature. Within densely built urban environments, structures generally cast shadows in their immediate vicinity. Under *CEQR Technical Manual* guidelines, a shadow assessment is required if a project would result in structures 50 feet or greater in height, or of any height if the project site is located adjacent to, or across the street from, a sunlight-sensitive resource.

The Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) would result in the construction and operation of CSO facilities at two sites along the Gowanus Canal (the Canal), and includes an above-ground structure approximately 50 feet tall at each site.

Given the height of the above-ground structures and their locations adjacent to the Canal, a shadow assessment is warranted. This chapter focuses on the interaction between the Project's above-ground structures and the shadows they may cast on sunlight-sensitive resources of concern, which include publicly accessible open space, sunlight-dependent features of historic resources, and natural areas that depend on sunlight.

B. METHODOLOGY

Sunlight-sensitive resources, as defined by the *CEQR Technical Manual*, are resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. Such resources generally include publicly accessible open space such as parks, plazas, playgrounds, and beaches, historic resources with sunlight-dependent architectural features, such as stained-glass windows, and natural resources where the introduction of shadows could alter the resource's condition or microclimate, such as water bodies and wetlands.

For the purposes of this analysis, the Canal is considered a sunlight-sensitive resource both for its use as a recreational open space and as a natural feature that supports fish, benthic invertebrates and plankton, as described in Chapter 9, "Natural Resources."

City streets, sidewalks, and non-publicly accessible open spaces are not considered resources of concern under CEQR methodology. In addition, project-generated open space cannot be significantly impacted by the Project, because without the Project, the open space would not exist.

A significant adverse shadow impact occurs when the incremental shadows added by a project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight, thereby significantly altering the public's use of the resource, threatening the viability of vegetation, or adversely affecting the use of a habitat or passage through it (i.e., a shadow impact to a water body). Each project must be considered on its own merits based on the extent and duration of new shadows and an analysis of the resource's sensitivity to reduced sunlight.

Following the guidelines of the *CEQR Technical Manual*, a preliminary screening assessment must first be conducted to ascertain whether a project's shadows could reach any sunlight-sensitive resources at any time of year. The preliminary screening assessment, in turn, consists of three tiers of analysis. The first tier determines a simple radius around a proposed project encompassing the area where the longest shadow could be cast as a result of project implementation. If the first tier analysis reveals sunlight-sensitive resources within this radius, the analysis proceeds to the second tier, which refines the area that could be affected by project shadows by removing the areas where shadows cannot be cast due to the path of the sun over New York City (i.e., areas that fall within a certain range of angles south of a project site).

If the second tier of analysis does not eliminate the possibility of a proposed project casting new shadows on sunlight-sensitive resources, a third tier of screening analysis is required to further refine the area that could be affected by project shadow by looking at specific representative days in each season and determining the maximum extent of shadows for each representative day. If the third tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a detailed shadow analysis is required to determine the extent and duration of the incremental shadows resulting from the project.

At the Head End Site, it is anticipated that some type of publicly accessible open space or waterfront access would be developed as part of the Project. As mentioned above, open space that would be generated as part of a project cannot experience a significant adverse shadow impact as a result of the Project itself. Nevertheless, a qualitative discussion of potential shadow effects on the anticipated project-generated open space at the Head End site is included in the analysis below**.**

C. PRELIMINARY SCREENING ASSESSMENT

A base map was developed using Geographic Information Systems (GIS)[1] showing the location of the two above-ground structures and the surrounding street layout (see **Figure 6-1**). Potential sunlight-sensitive resources identified in the open space, historic and cultural resources, and natural resources assessments were included on the map, as described below.

TIER 1 SCREENING ASSESSMENT

For the Tier 1 assessment, the longest shadow that the above-ground structures could cast between one and a half hours after sunrise and one and a half hours before sunset is calculated,[2] and, using this length as the radius, a perimeter is drawn around the project site. Anything outside this perimeter representing the longest possible shadow could never be affected by project-generated shadows, while anything inside the perimeter needs additional assessment.

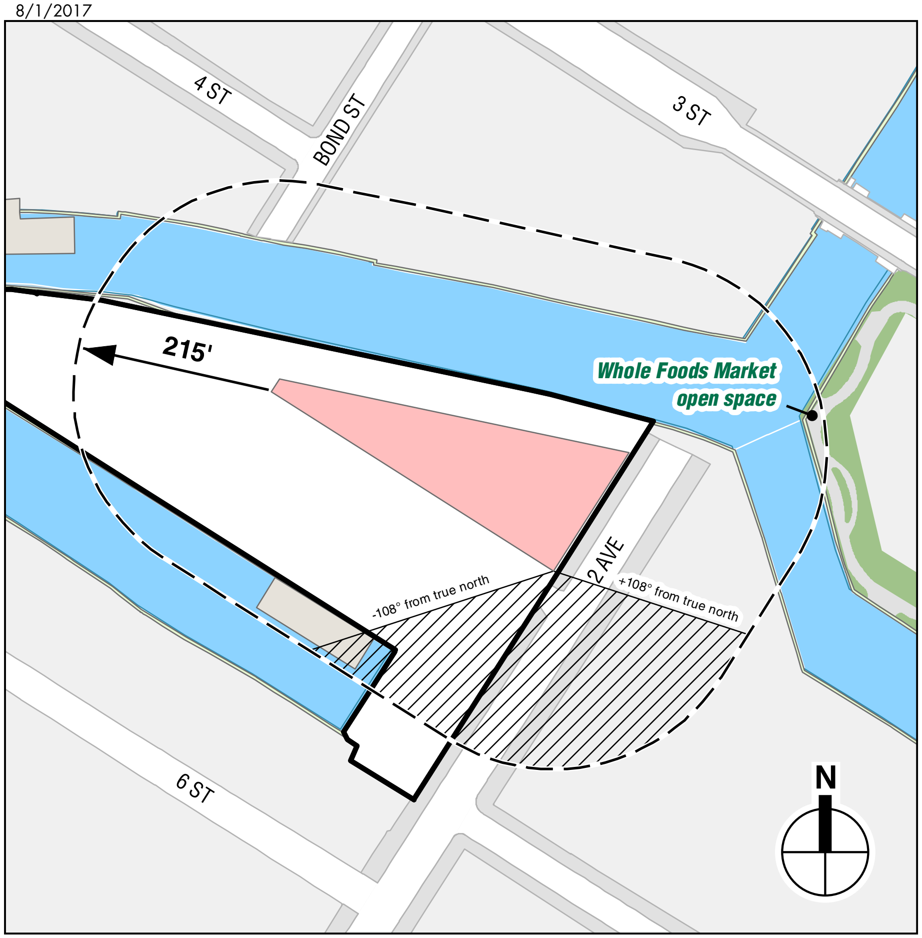
According to the *CEQR Technical Manual*, the longest shadow that a structure can cast at the latitude of New York City occurs on December 21, the winter solstice, at the start of the analysis day at 8:51 AM, and is equal to 4.3 times the height of the structure.

Therefore, at a height of approximately 50 feet above curb level, the two above-ground structures could each cast a shadow up to 215 feet in length (50 feet x 4.3). Using this length as the radius, a perimeter was drawn around the Project Site (see **Figure 6-1**).

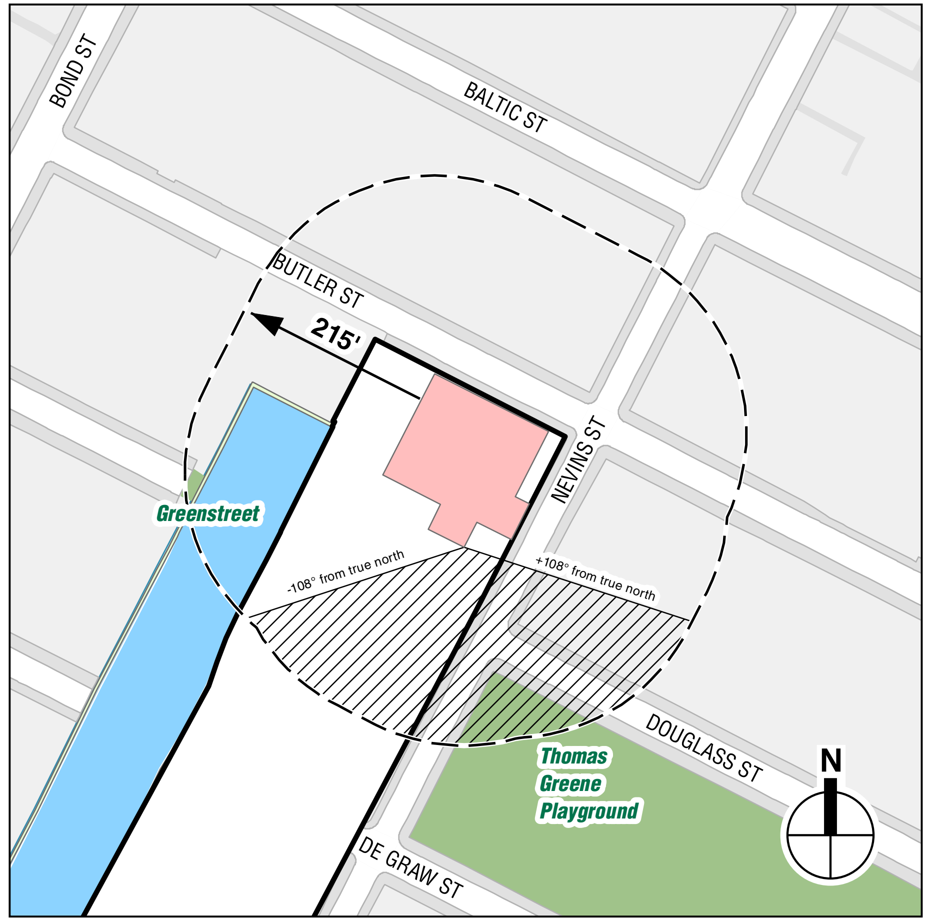
[1] Software: Esri ArcGIS 10.3; Data: New York City Department of Information Technology and Telecommunications (DoITT) and other City agencies, as well as AKRF site visits.

[2] Per CEQR guidelines, the shadow assessment considers shadows occurring between one and a half hours after sunrise and one and a half hours before sunset. For times outside this analysis timeframe, the sun is near the horizon, producing shadows that are very long, move fast, and generally blend with shadows from existing structures until the sun reaches the horizon and sets. Consequently, shadows occurring outside the stated analysis timeframe are not considered significant under CEQR, and their assessment is not required.

8/1/2017



Owls Head Site



Head End Site

0 200 FEET

- Project Sites
- Superstructure Footprint
- Tier 1: Longest shadow study area boundary
- Tier 2: Area south of site that could never be shaded by superstructure
- Publicly Accessible Open Space
- Gowanus Canal: Publlic Open Space and Natural Resource

Note: Location and configuration of superstructure footprints are conservative and based on most current available plans.

Tier 1 and Tier 2 Screening Assessments
Figure 6-1

Three resources of concern are located in the Head End Site's longest shadow study area: a portion of the Canal; a portion of Thomas Greene Playground, a public open space located between Douglass and Degraw Streets and south of the above-ground structure; and a small Greenstreets[3] open space on the west side of the Canal where Douglass Street ends at the Canal's edge. Two historic resources, the Dunn and the ASPCA buildings (see Chapter 7, "Historic Resources") are located in the longest shadow study area; however, these buildings do not have any sunlight-dependent features and consequently they do not require further analysis for shadows.

Resources of concern in the Owls Head Site's longest shadow study area are limited to portions of the Canal and a small portion of the Whole Foods Market open space on the far side of the Canal, east of the Owls Head Site.

TIER 2 SCREENING ASSESSMENT

Because of the path that the sun follows across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given project site. In New York City, this area lies between -108 and +108 degrees from true north. **Figure 6-1** illustrates this triangular area south of each of the two sites. The complementary area to the north within the longest shadow study area represents the remaining area that could potentially experience new project-generated shadows at each site.

The Tier 2 assessment showed that at the Head End Site, the Thomas Greene Playground is located too far south to ever receive project-generated shadows from the above-ground structure. The Greenstreets space across from the Canal at the end of Douglass street as well as a portion of the Canal itself are located in the remaining longest shadow study area and require Tier 3 assessment.

At the Owls Head Site, portions of the Canal and a small portion of the Whole Foods Market open space are located in the remaining longest shadow study area and therefore also require Tier 3 assessment.

TIER 3 SCREENING ASSESSMENT

The Tier 3 assessment serves to determine the daily extent of the Project's shadows on each representative analysis day, without accounting for intervening buildings and existing shadows. If the result shows that project-generated shadows could be long enough to reach a sensitive resource on a given analysis day, then a more detailed analysis that would account for any intervening buildings and baseline shadows would be required for that analysis day and sensitive resource to determine the additional or incremental shadows that might occur.

The direction and length of shadows vary throughout the course of the day and differ depending on the season. In order to determine whether project-generated shadows could fall on a sunlight-sensitive resource, three-dimensional (3D) computer mapping software[4] was used in the Tier 3 screening assessment to calculate and display the Project's shadows on individual representative days of the year. A computer model was developed containing 3D representations of the elements in the base map from the Tier 1 and 2 screening assessments, topography of the longest shadow study area from the Tier 1 and Tier 2 assessments, and a 3D representation of the Project.

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[3] The Greenstreets program, part of the NYC Green Infrastructure Plan, converts paved, vacant traffic islands and medians into green spaces filled with trees, shrubs and groundcover in an effort to capture stormwater. These planted areas within unused portions of roadbeds are considered sunlight-sensitive resources.

[4] Bentley MicroStation.

REPRESENTATIVE DAYS FOR ANALYSIS

Following the guidance in the *CEQR Technical Manual*, shadows on the summer solstice (June 21), winter solstice (December 21), and spring and fall equinoxes (March 21 and September 21, which are approximately the same in terms of shadow patterns) were modeled, to represent the range of shadows over the course of the year. An additional representative day during the growing season was also modeled—May 6—which is approximately halfway between the summer solstice and the spring equinox.

TIMEFRAME WINDOW OF ANALYSIS

The shadows assessment considers shadows occurring between one and a half hours after sunrise and one and a half hours before sunset. For times outside this analysis timeframe, the sun is near the horizon, producing shadows that are very long, move fast, and generally blend with shadows from existing structures until the sun reaches the horizon and sets. Consequently, shadows occurring outside the stated analysis timeframe are not considered significant under CEQR, and their assessment is not required.

TIER 3 SCREENING ASSESSMENT RESULTS

Figures 6-2 and 6-3 illustrate the range of shadows that would be cast, in the absence of intervening buildings, by the above-ground structure on the Head End Site on the four representative days for analysis. Similarly, **Figures 6-4 and 6-5** illustrate the range of shadows that would be cast by the above-ground structure on the Owls Head Site on the four representative days for analysis. As they move east and clockwise over the landscape, the shadows are shown occurring approximately every 60 minutes from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset).

For the Head End Site, the Tier 3 screening assessment showed that project-generated shadows would not fall on the Canal or any other sunlight-sensitive resources on the winter analysis day, and would fall on a portion of the Canal for approximately a little over an hour at the beginning of the spring, summer and fall analysis days. Neither the Greenstreets at Douglass Street nor Thomas Greene Playground would receive project-generated shadows on any representative day; therefore, these resources do not require further assessment.

For the Owls Head Site, the Tier 3 screening assessment showed that project-generated shadows would move across the full width of the Canal north-adjacent to the site throughout the winter analysis day. On the March 21/September 21 analysis day project-generated shadows would move across a smaller portion of the Canal during the mid-day and afternoon. On the late spring and summer analysis days, project-generated shadows would fall on a limited portion of the Canal for approximately the final hour of the analysis day.

Project-generated shadows would not be long enough to reach the Whole Foods Market open space on any analysis day, and no further assessment is required for that resource.

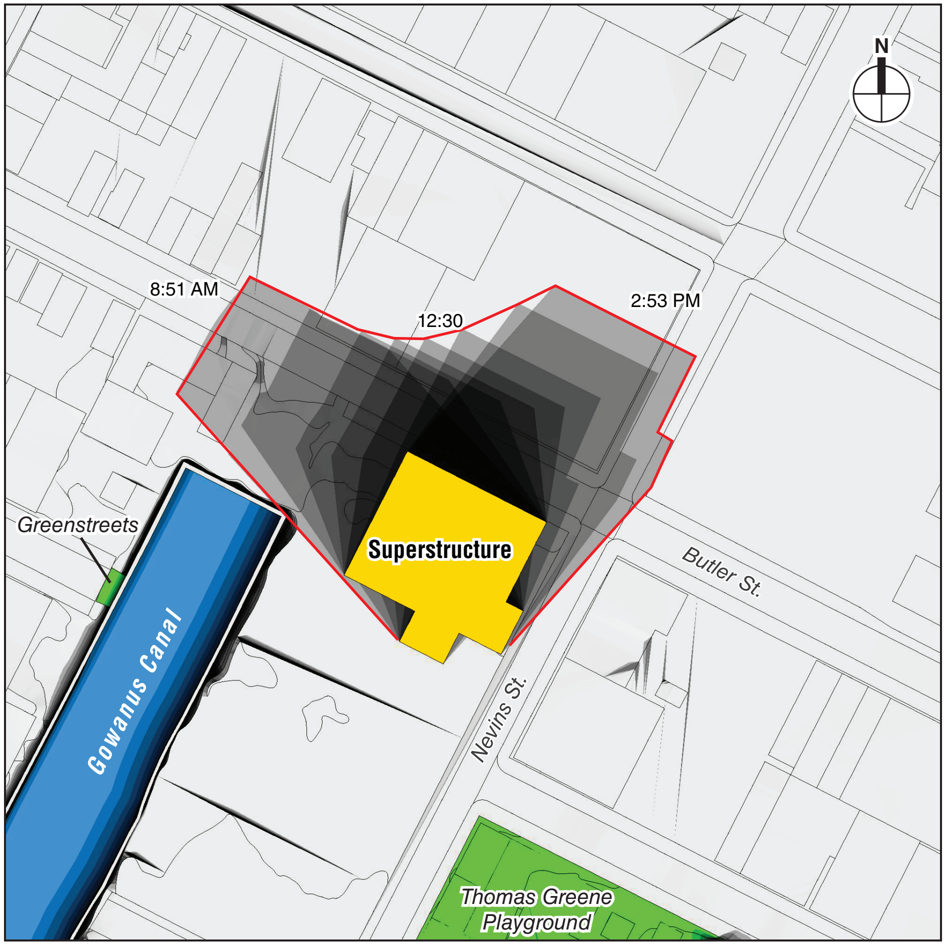
Therefore, a detailed analysis was conducted for both Sites to determine the extent and duration of incremental shadows on portions of the Canal.

D. DETAILED SHADOWS ANALYSIS

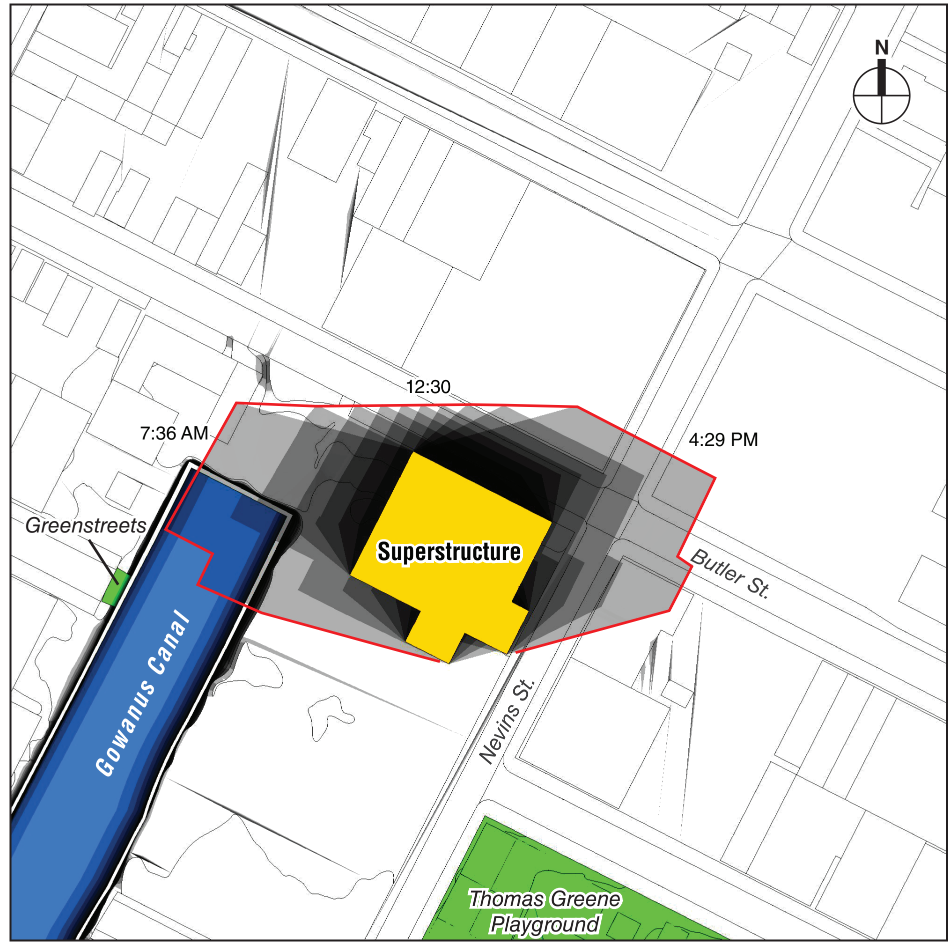
Detailed shadows analyses were performed for each of the representative days and analysis periods indicated in the Tier 3 screening assessment.

The Future Condition in the 2028 Analysis Year was established as a baseline condition, containing existing buildings and any future developments planned in the area, to illustrate the baseline shadows. The Probable Impacts of the Project and its shadows were then compared with the baseline condition to determine the incremental shadows that would result with the Project.

3.3.2017



December 21



March 21 / September 21

Shadow

Limit of Project Shadow (over total duration of anaysis day)

0 100 Feet

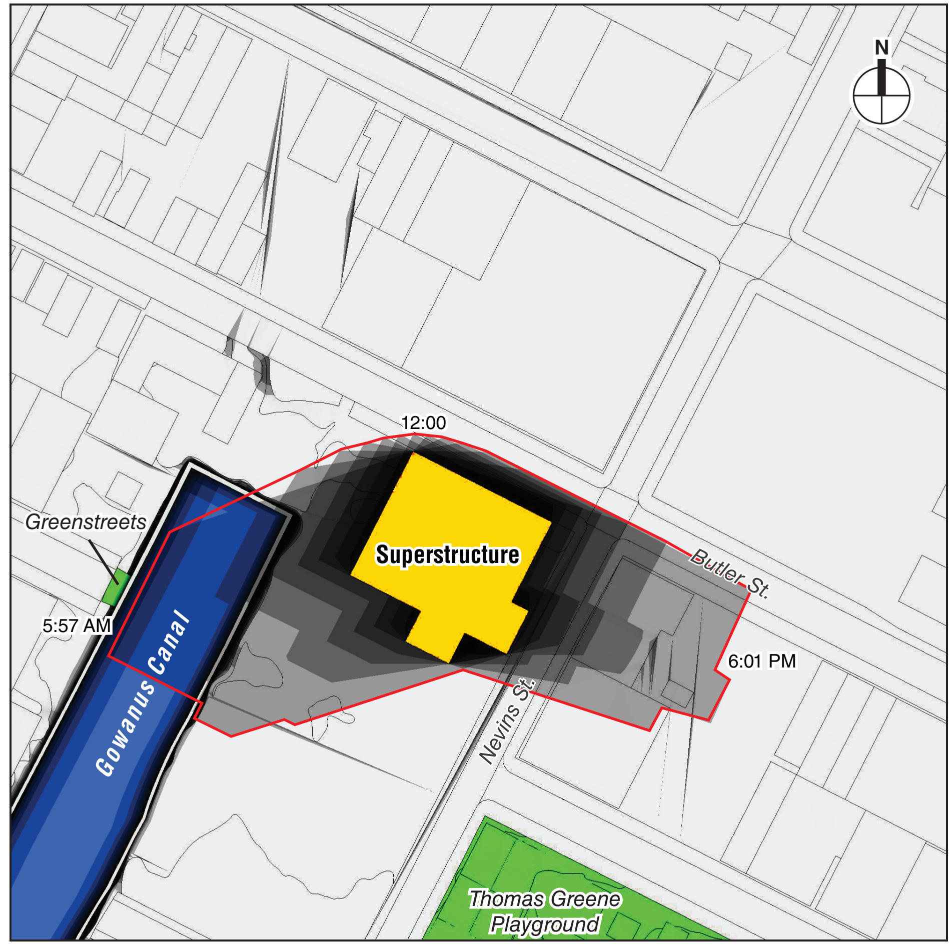
This figure illustrates the range of shadows that would occur, absent intervening structures, from the Superstructure on the winter solstice and spring and fall equinox analysis days. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset). The Tier 3 screening assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

Tier 3 Screening Assessment - Head End Site - Equinoxes and Winter

Figure 6-2

3.3.2017

May 6 / August 6



June 21

Shadow

Limit of Project Shadow (over total duration of anaysis day)

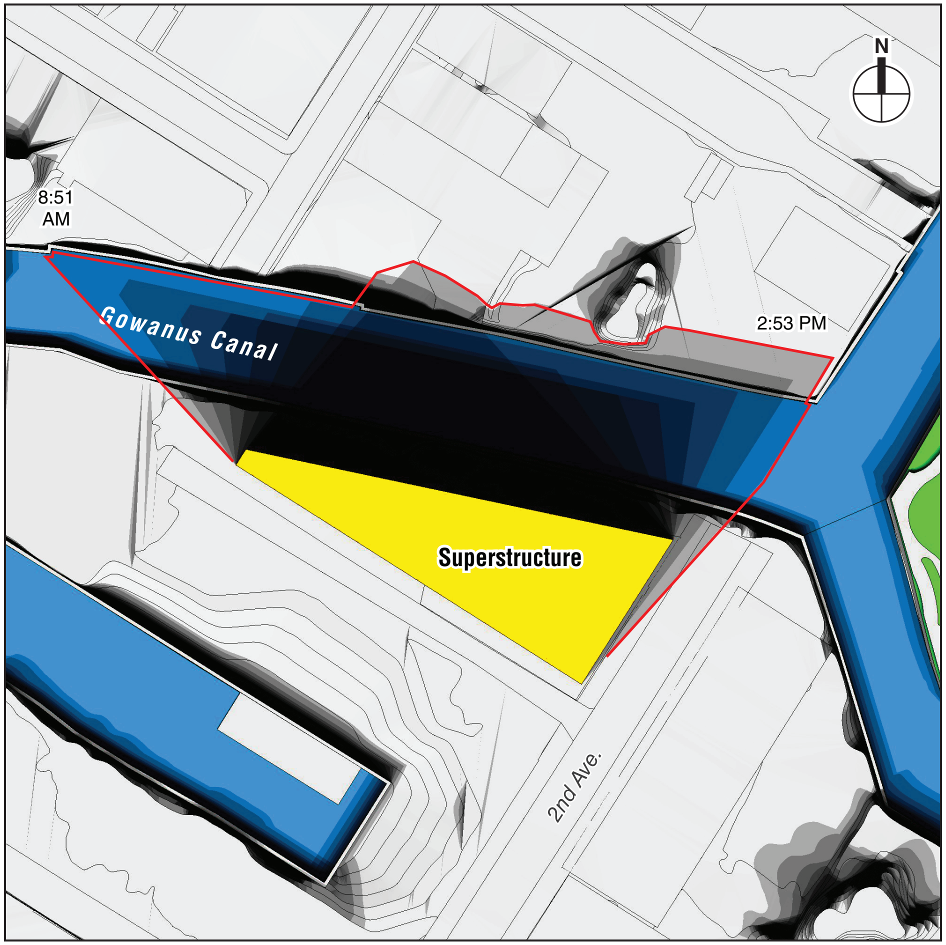
0 100 Feet

This figure illustrates the range of shadows that would occur, absent intervening structures, from the Superstructure on the summer solstice and May 6 / August 6 analysis days. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset). The Tier 3 screening assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

Tier 3 Screening Assessment - Head End Site - Late Spring and Summer

Figure 6-3

8.4.2017



December 21

March 21 / September 21

Shadow

Limit of Project Shadow (over total duration of anaysis day)

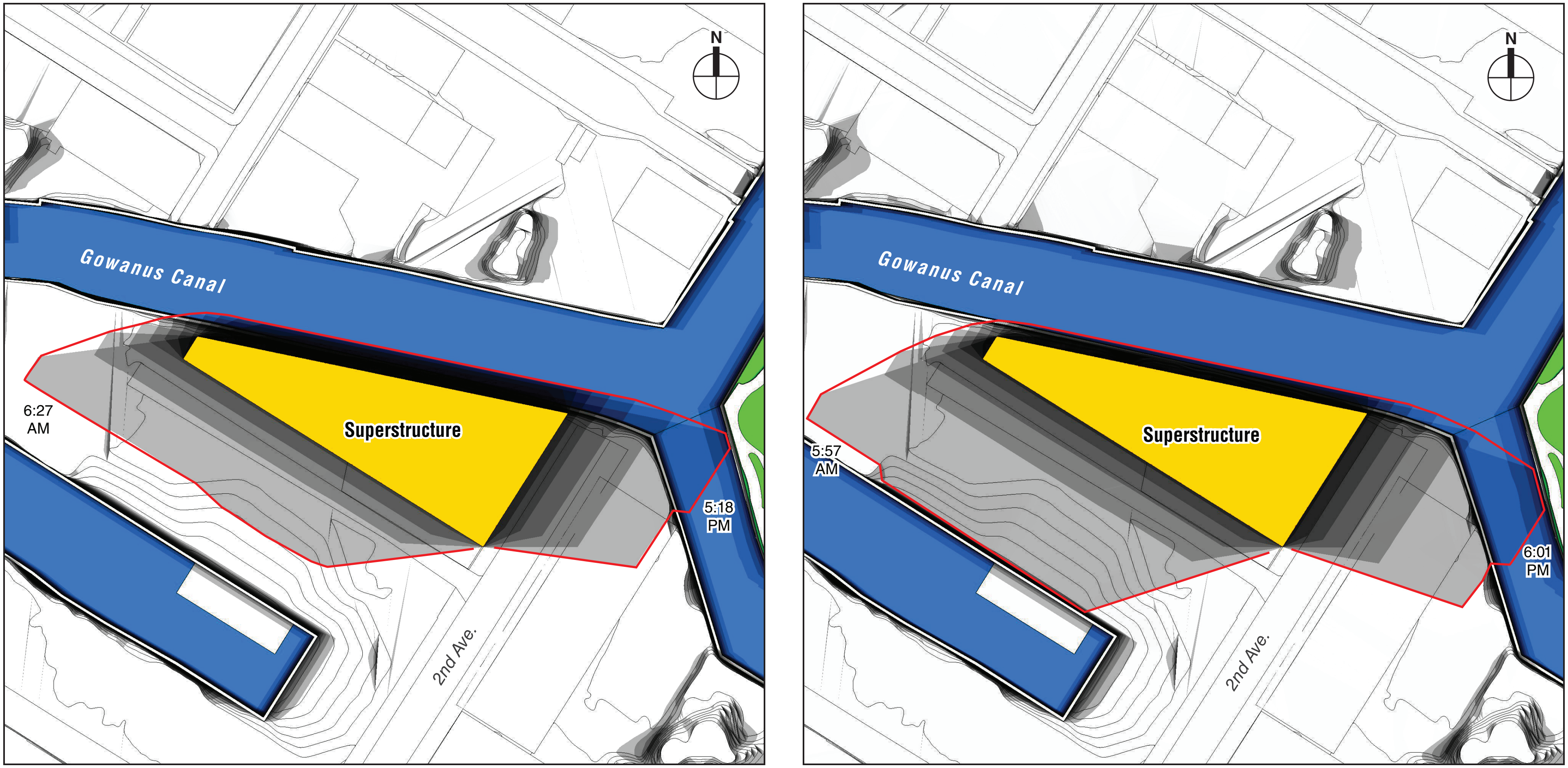
0 100 Feet

This figure illustrates the range of shadows that would occur, absent intervening structures, from the Superstructure on the winter solstice and spring and fall equinox analysis days. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset). The Tier 3 screening assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

Tier 3 Screening Assessment - Owls Head Site - Equinoxes and Winter

Figure 6-4

8.2.2017



May 6 / August 6

June 21

Shadow

Limit of Project Shadow (over total duration of anaysis day)

0 100 Feet

This figure illustrates the range of shadows that would occur, absent intervening structures, from the Superstructure on the summer solstice and May 6 / August 6 analysis days. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset). The Tier 3 screening assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

Tier 3 Screening Assessment - Owls Head Site - Late Spring and Summer

Figure 6-5

3D representations of the existing buildings in the study area were developed using data obtained from the New York City Department of Information Technology (NYC DoITT) and were added to the 3D model used in the Tier 3 screening assessment.

The computer simulation produced an animation showing the movement of shadows over the course of each analysis period. The analysis determined the time when incremental shadows would enter each sensitive resource and the time it would exit.

Table 6-1 summarizes the entry and exit times and total duration of incremental shadows on each affected sun-sensitive resource. **Figures 6-6 to 6-12** document the results of the analysis by providing graphic representations from the computer animation of times when incremental shadows would fall on a sun-sensitive resource. The figures illustrate and quantify the extent of additional, incremental shadows at that moment in time, highlighted in red, and also show existing shadows and remaining areas of sunlight.

Table 6-1
Incremental Shadows Durations[1]

Analysis day and timeframe window	December 21 8:51 AM–2:53 PM	March 21/September 21[2] 7:36 AM–4:29 PM	May 6/August 6[2] 6:27 AM–5:18 PM	June 21 5:57 AM–6:01 PM
Gowanus Canal – portion west of Head End Site	—	7:36 AM–9:15 AM Total: 1 hr 39 min	6:27 AM–7:45 AM Total: 1 hr 18 min	5:57 AM–7:15 AM Total: 1 hr 18 min
Gowanus Canal – portions north and east of Owls Head Site	8:51 AM–2:53 PM Total: 6 hr 2 min	11:30 AM–4:29 PM Total: 4 hr 59 min	4:45 PM–5:18 PM Total: 33 min	5:30 PM–6:01 PM Total: 31 min

Notes:
1. The table indicates shadow entry and exit times and total duration of incremental shadows for each sunlight-sensitive resource.
2. September 21, the fall equinox, has the same shadow patterns as March 21, the spring equinox. Similarly, August 6, the halfway point in the yearly progression between the fall equinox and the summer solstice, has the same shadow patterns as May 6, the halfway point between the spring equinox and the summer solstice.

Note that daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

HEAD END SITE

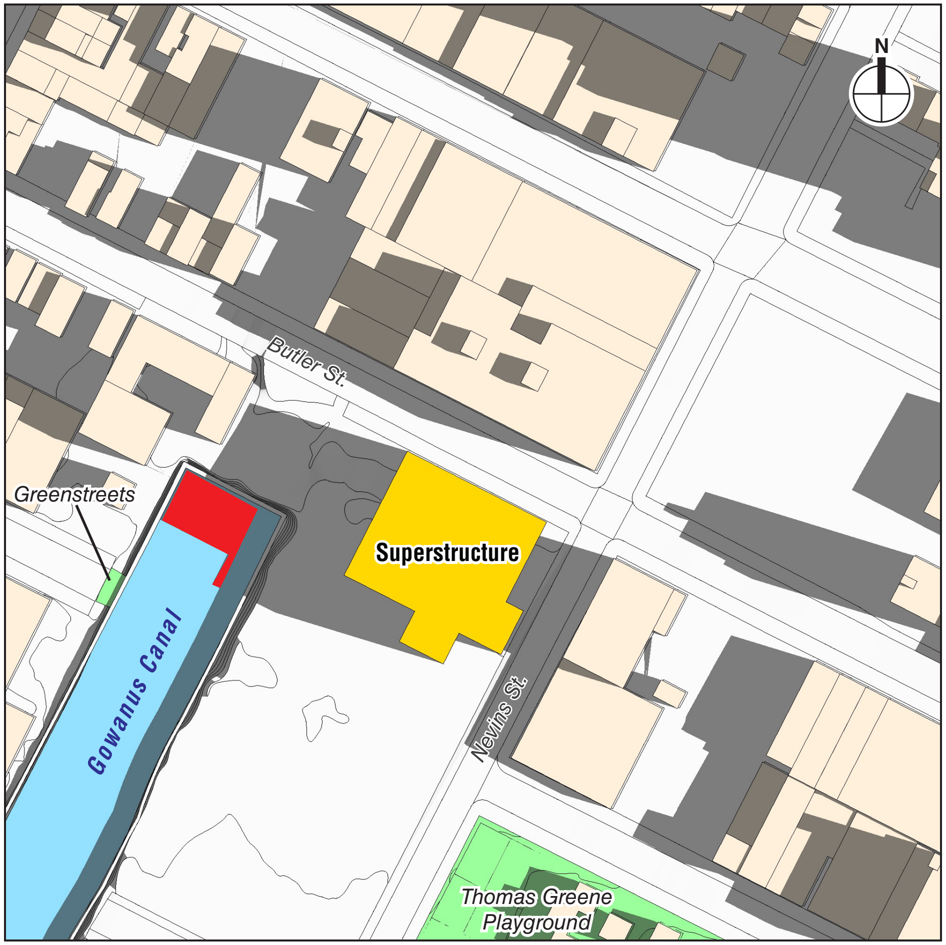
As shown in **Figures 6-6 to 6-8**, the movement of incremental shadows at the head end of the Canal follows a similar pattern through the spring, summer, and fall representative analysis days. At the start of each of the three analysis days for the Head End Site, an area at the head of the Canal would receive incremental shadows, and over the course of the following approximately hour and a half, (depending on the season, see **Table 6-1**), the incremental shadows would move eastward and clockwise off the Canal's surface. In each season, by one hour after the start of the analysis day, the area of incremental shadows would be small, as shown in the figures.

This area of the Canal would receive direct sunlight throughout much of the day after this early morning period, due to lack of tall structures to the south, east and west of the Canal's head end.

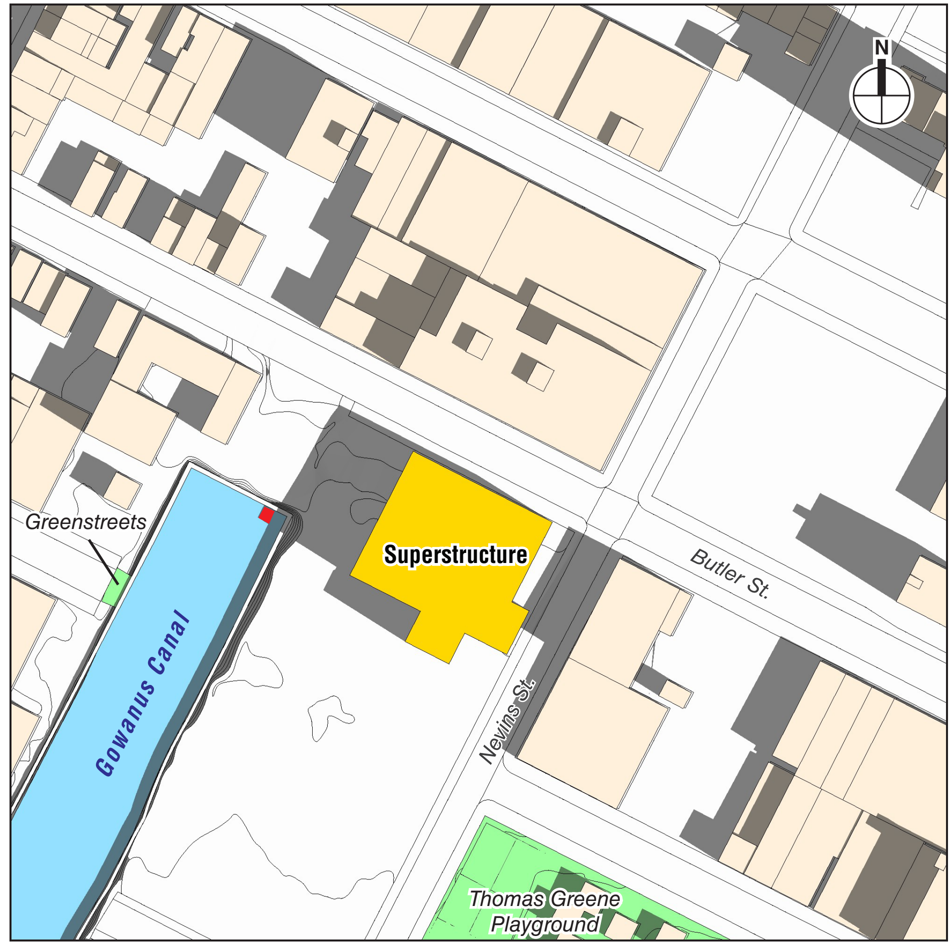
OWLS HEAD SITE

On the December 21 analysis day, representing the winter months, incremental shadows would fall northward onto the Canal throughout the day, moving from west to east. In the morning, incremental shadows would fall northwest, reaching across much of the Canal's width but not all the way to the north bank (see **Figure 6-9**). In the afternoon incremental shadows would fall to the northeast, reaching all the way across the Canal and beyond for approximately the final 90 minutes of the analysis day (see **Figure 6-10**).

3.3.2017



7:45 AM EST



9:00 AM EST

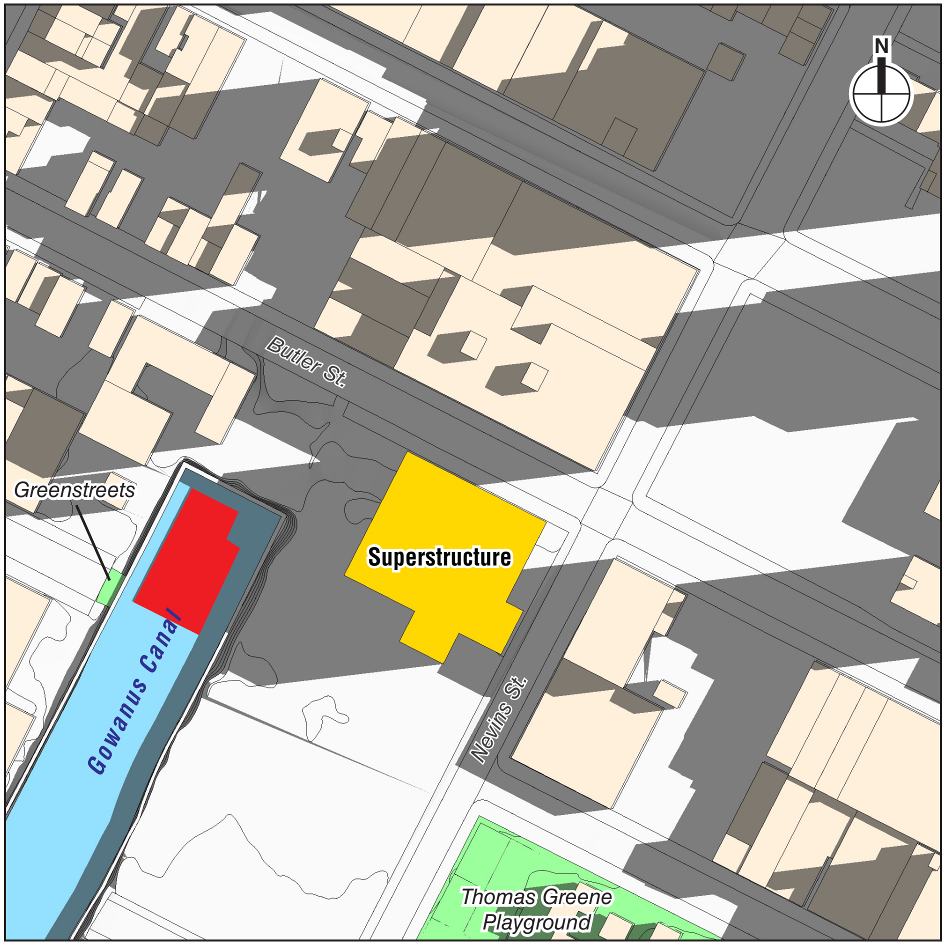
Incremental Shadow on Sun-Sensitive Resources

0 100 Feet

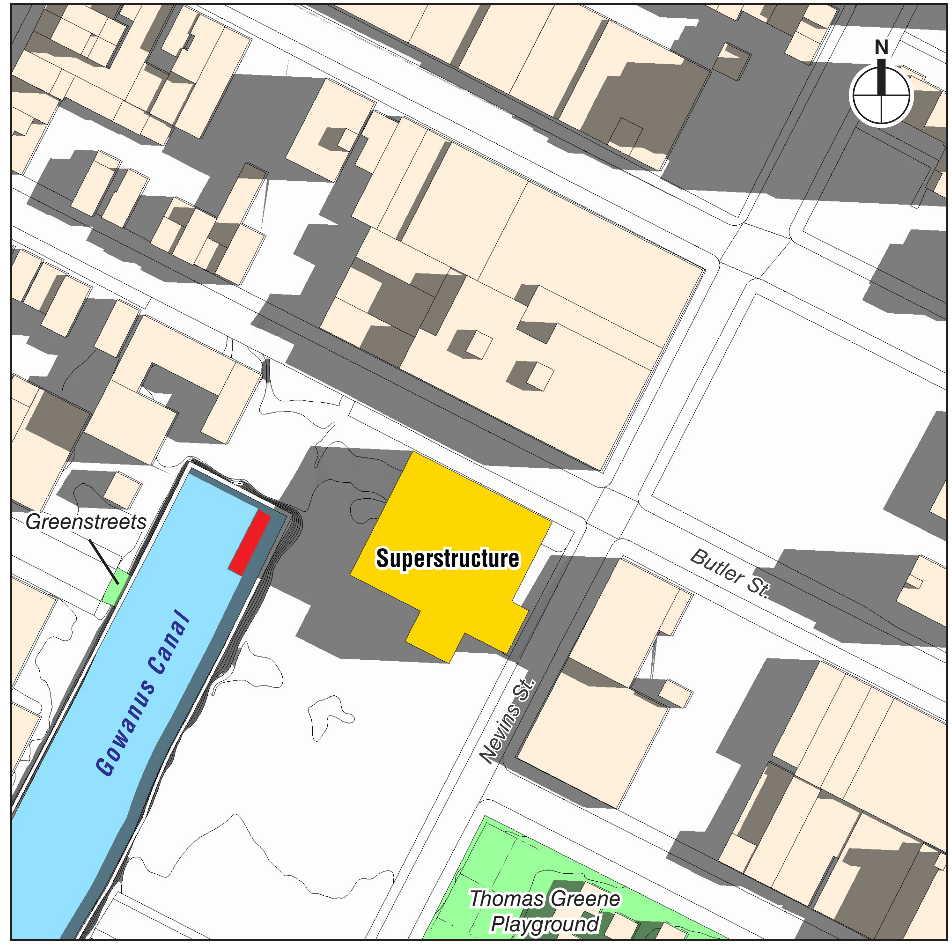
NOTE: *All times are Eastern Standard Time.*

Detailed Shadow Assessment
Head End Site - March 21 / September 21
Figure 6-6

3.3.2017



6:30 AM EST



7:30 AM EST

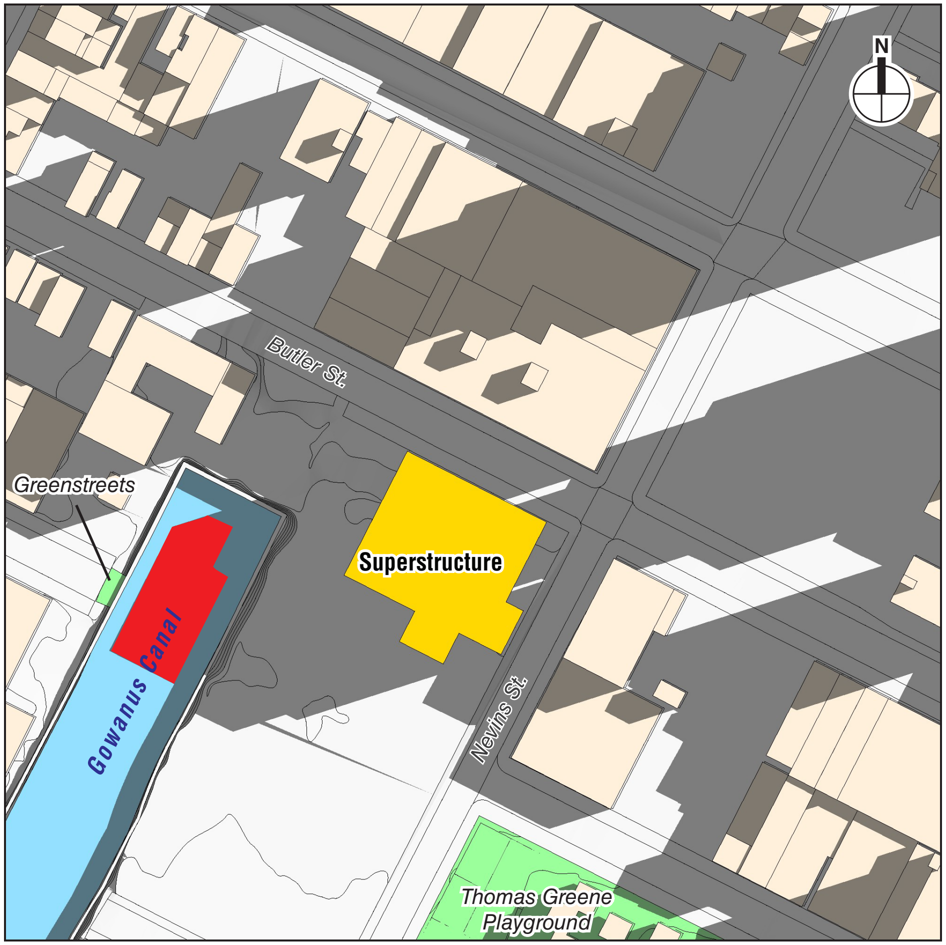
Incremental Shadow on Sun-Sensitive Resources

0 100 Feet

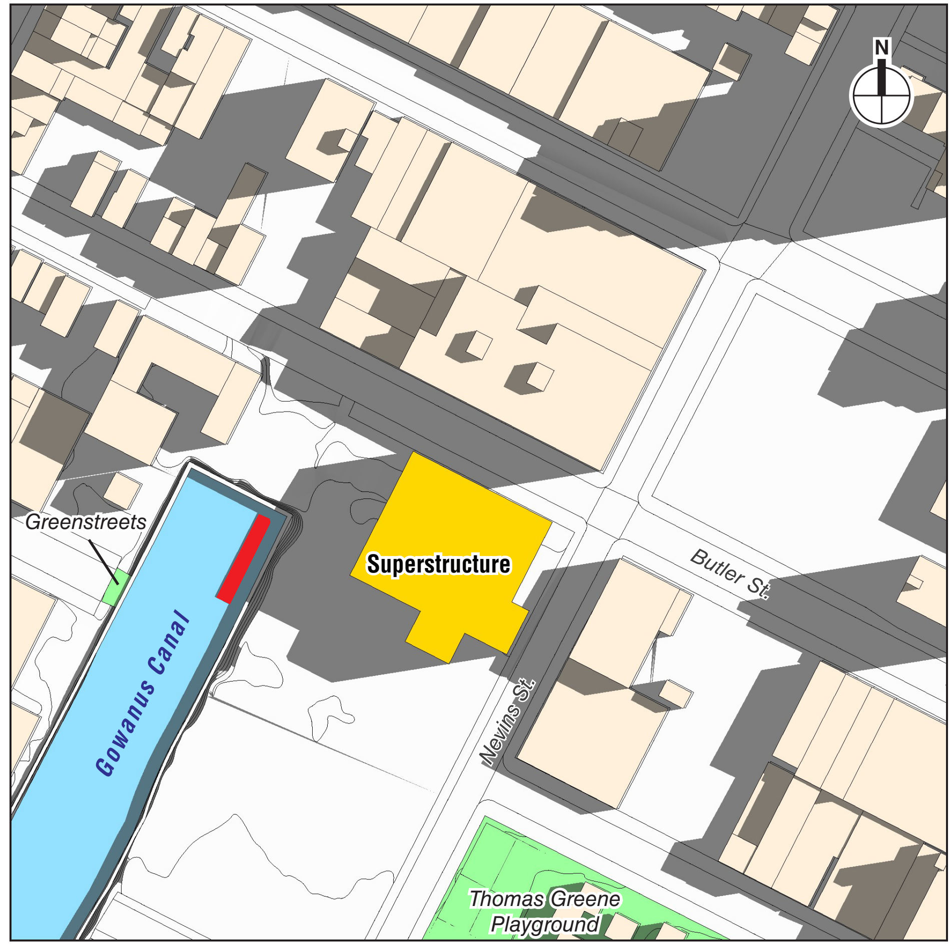
NOTE: *All times are Eastern Standard Time.*

Detailed Shadow Assessment
Head End Site - May 6 / August 6
Figure 6-7

3.3.2017



6:00 AM EST



7:00 AM EST

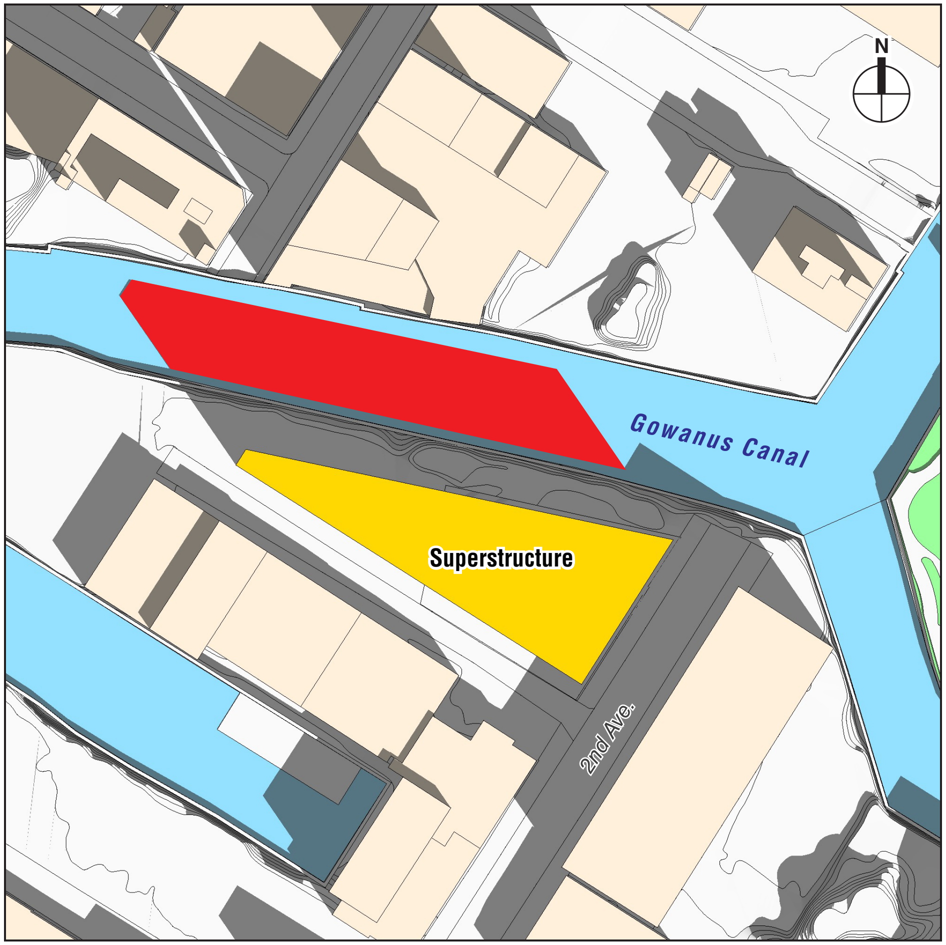
Incremental Shadow on Sun-Sensitive Resources

0 100 Feet

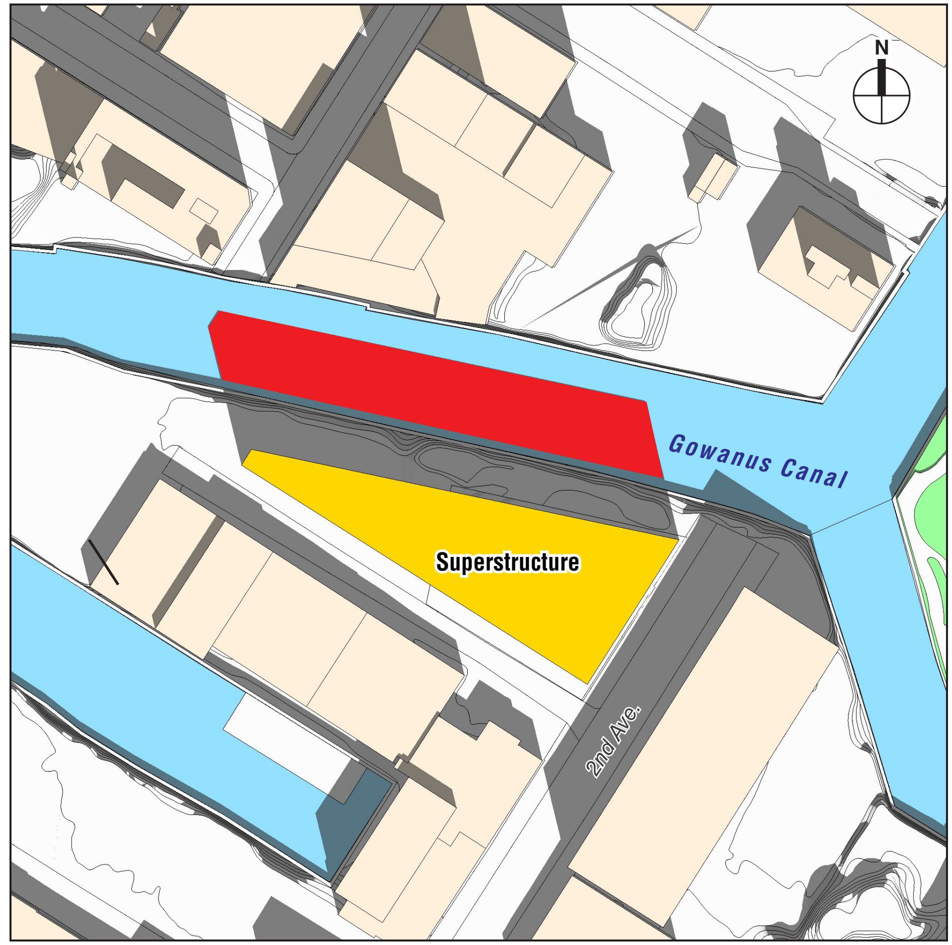
NOTE: *All times are Eastern Standard Time.*

Detailed Shadow Assessment
Head End Site - June 21
Figure 6-8

8.4.2017



9:30 AM EST



11:00 AM EST

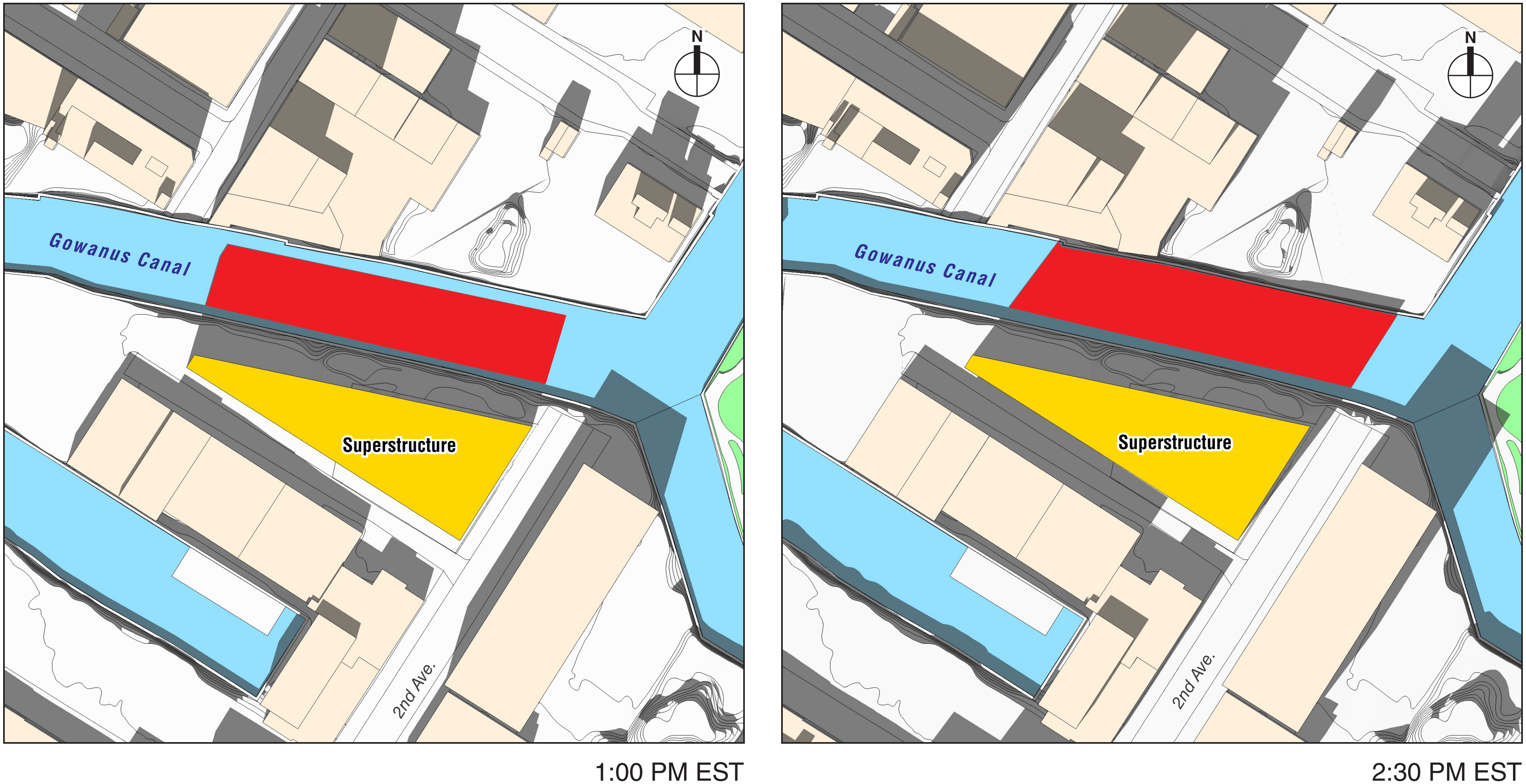
Incremental Shadow on Sun-Sensitive Resources

0 100 Feet

NOTE: *All times are Eastern Standard Time.*

Detailed Shadow Assessment
Owls Head Site - December 21 (Morning)
Figure 6-9

8.4.2017



Incremental Shadow on Sun-Sensitive Resources

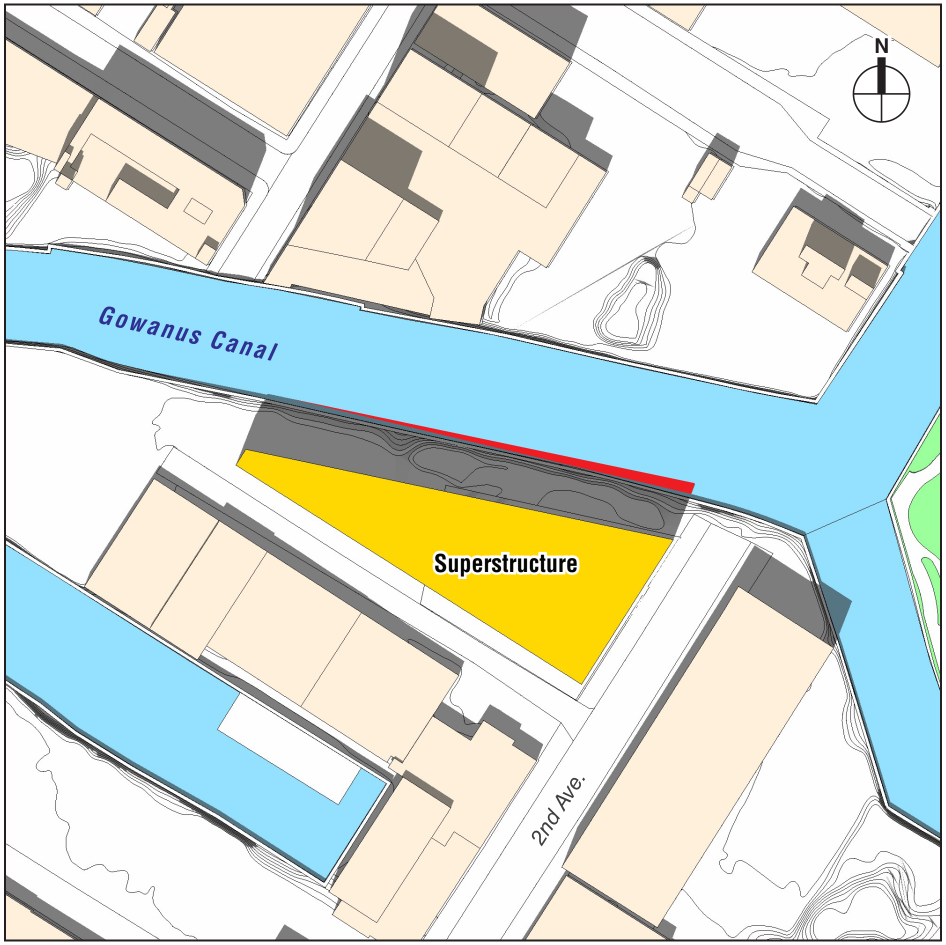
0 100 Feet

NOTE: *All times are Eastern Standard Time.*

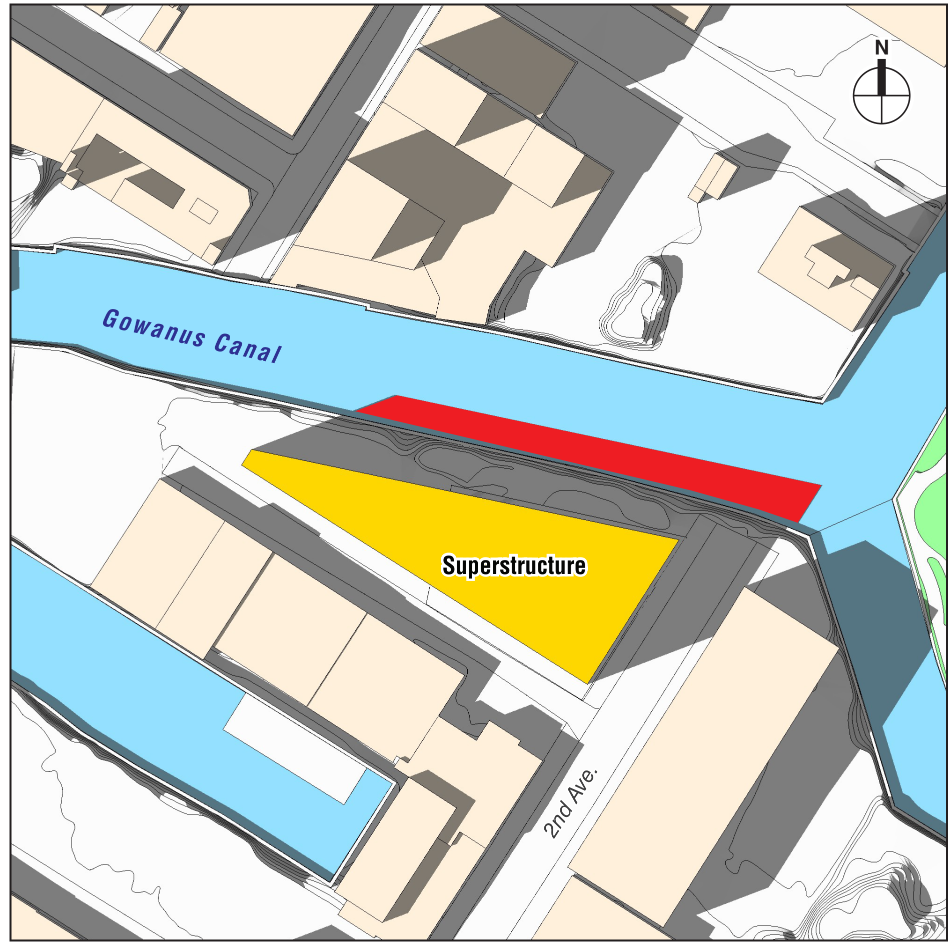
Detailed Shadow Assessment
Owls Head Site - December 21 (Afternoon)
Figure 6-10

Gowanus Canal CSO Facilities

8.4.2017



1:00 PM EST



4:00 PM EST

Incremental Shadow on Sun-Sensitive Resources

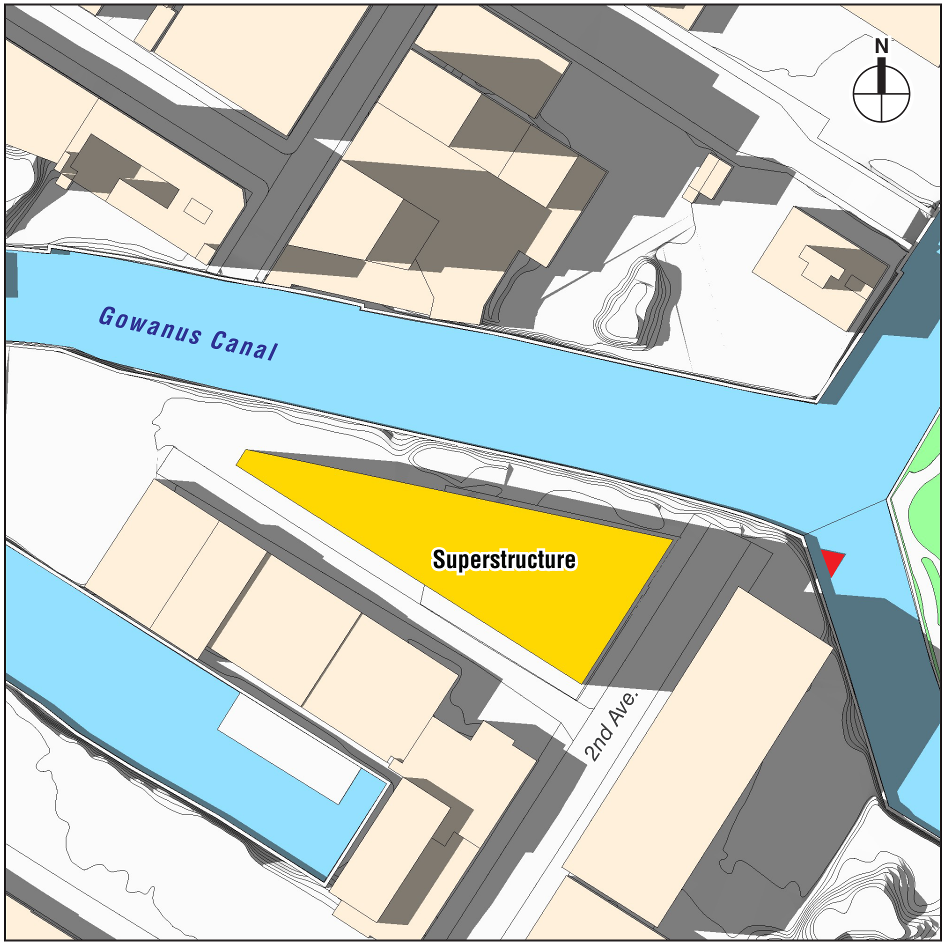
0 100 Feet

NOTE: *All times are Eastern Standard Time.*

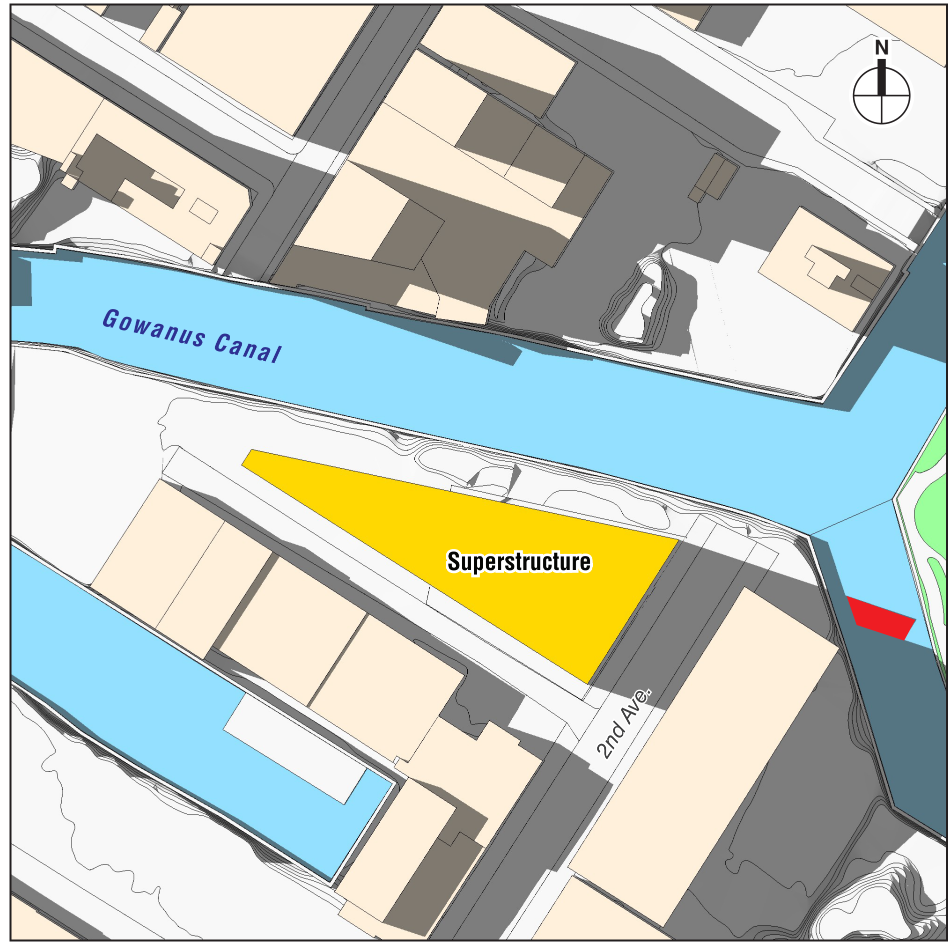
Detailed Shadow Assessment
Owls Head Site - March 21 / September 21
Figure 6-11

Gowanus Canal CSO Facilities

8.4.2017



May 6 / August 6 - 5:00 PM EST



June 21 - 6:00 PM EST

Incremental Shadow on Sun-Sensitive Resources

0 100 Feet

NOTE: *All times are Eastern Standard Time.*

Detailed Shadow Assessment
Owls Head Site - May 6 / August 6 and June 21
Figure 6-12

On the March 21/September 21 analysis day the Project's shadows would be too short to reach the adjacent Canal in the morning until about 11:30 AM. From 11:30 AM onward incremental shadows would fall northward, and then to the northeast on portions of the Canal. The extent of incremental shadows would remain limited to a small area adjacent to the site for much of this period, extending a little further towards the end of the analysis day (see **Figure 6-11**).

On the May 6/August 6 and June 21 analysis days, a limited area of incremental shadows would fall eastward onto a portion of the Canal for the final half hour of the day (see **Figure 6-12**).

E. PROBABLE IMPACTS OF THE PROJECT

POTENTIAL INCREMENTAL SHADOW EFFECTS ON RECREATIONAL USES OF THE CANAL

Recreational uses on the Canal, such as fishing and boating[5], would likely be heaviest in the spring, summer, and fall, and much lighter in winter.

At the Head End Site, the limited extent and duration of incremental shadows in spring, summer, and fall, described above, would not substantially affect recreational use of the Canal.

At the Owls Head Site, incremental shadows in the spring, summer, and fall would be limited in extent, as described above, and would fall only on small areas of the Canal adjacent to the site. Similar to the Head End Site, the limited areas of incremental shadows would not substantially affect recreational use of the Canal. In winter, although the extent of the incremental shadows would be greater, its effect on recreational use—which is already much lower due to colder temperatures—would not be significant. Moreover, extensive areas of the Canal adjacent to the area affected by incremental shadows would continue to receive direct sunlight and be available to users.

Therefore there are no significant adverse shadows impacts on the recreational uses of the Canal.

POTENTIAL INCREMENTAL SHADOW EFFECTS ON AQUATIC HABITAT

Currently, the portions of the Canal adjacent to the Project Sites have been designated Use Class SD. The SD classification is generally given to waters that—because of natural or man-made conditions—cannot meet the requirements for primary or secondary contact or fish propagation. The Canal contains contaminated sediments, limited transparency and a poor benthic community structure as a result of a history of heavy industrial uses. The Canal has provided commercial shipping access for a variety of industries, including oil refineries, machine shops, manufactured gas plants (MGP), chemical plants, soap makers, and tanneries. Industries with the greatest effects on the Canal, as indicated by sediment sampling, included MGP facilities, petroleum bulk-storage facilities, chemical manufacturers, metal smelters, and coal yards. As a result, these documented activities have created an environmentally stressed condition in the Canal.

However, as stated in Chapter 1, "Project Description," although existing water quality standards are already being met in the Canal, the USEPA ROD for the Gowanus Canal Superfund site directs the City to construct CSO controls that would serve to further improve water quality by reducing CSOs from

[5] Waters in the Gowanus Canal are classified as either Use Class SD (upper section) or Use Class I (lower section), per the Water Quality Classifications, NYS Department of Environmental Conservation, Division of Water, Bureau of Water Assessment and Monitoring. The best usage of Class SD waters is fishing. The best usage of Class I waters is secondary contact recreation which includes, but is not limited to, fishing and boating.

being discharged to the Canal thereby helping to improve the aquatic habitat for migratory species that occur in the area (see Chapter 9, “Natural Resources”). The movement of the Canal waters due to both the natural tidal cycle and the operation of the Flushing Tunnel carry phytoplankton through existing shaded areas of the Canal, which move west to east and clockwise as the sun travels across the sky. Motile organisms such as fish and epibenthic macroinvertebrates (e.g., crabs) would be expected to move through the incremental shadows. In addition, the portion of the Canal receiving project-generated shadows is limited relative to the Canal’s overall size, so the volume of water affected by the incremental shadows would be small. Finally, similar to the other waters of the Upper Harbor, suspended materials in the Canal water would limit light and shadow penetration, further limiting the volume of affected water.

Therefore, project-generated shadows would not be expected to affect primary productivity of the aquatic resources (plankton, fish, and benthic invertebrates) in the future with the Project, and any potential for a minor hindrance on fish passage within the small band of project-generated shadows cast across the Canal would not be significant.

POTENTIAL SHADOW EFFECTS ON THE PROJECT’S OPEN SPACE

As noted in “B. Methodology,” above, it is anticipated that the Project would include some form of waterfront public access or open space at the Head End Site. The above-ground structure would occupy most of the northern end of the site; therefore, the Project may include some type of open space located primarily to the south of the above-ground structure, and to a small extent, southwest and west of it. Consequently, shadows cast by the above-ground structure would generally not fall far enough to the south to substantially affect the open space at most times of the day throughout the year. If there are any portions of the project-generated open space that would be situated west or southwest of the site, these portions could receive shadows from the above-ground structure during the morning when shadows fall to the west. These portions of the open space would likely be in the sun during the mid-day and afternoon hours.

Therefore the Project’s open space would not receive substantial shadows for most of the day throughout the year.

F. CONCLUSION

Based on the results of the detailed shadow analysis presented above, the Project would not result in any significant adverse shadow impacts to the Canal or any other nearby sunlight-sensitive resources. ✷

Chapter 7: Historic and Cultural Resources

A. INTRODUCTION

This chapter considers the potential for the Project to affect historic and cultural resources. The Project would result in the construction of two Combined Sewer Overflow (CSO) Facilities at sites along the Gowanus Canal in the Gowanus neighborhood of Brooklyn and the construction of a new force main and sewers within adjacent streetbeds (the Project Sites). The Project Sites are located within the State/National Register (S/NR)-eligible Gowanus Canal Historic District.

This analysis has been prepared in accordance with the 2014 *New York City Environmental Quality Review (CEQR) Technical Manual*. The Project is mandated by the United States Environmental Protection Agency (USEPA) to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund) and would require permits from the United States Army Corps of Engineers (USACE) and the New York State Department of Conservation (NYSDEC), or their equivalents under CERCLA. Therefore, this analysis also has been prepared in accordance with Section 14.09 of the New York State Historic Preservation Act (NYSHPA) and Section 106 of the National Historic Preservation Act (NHPA).

As discussed in Chapter 1, "Project Description," following the designation of the Canal as a Superfund site by the USEPA in 2010, USEPA issued a Record of Decision (USEPA ROD) in September 2013 identifying actions to be undertaken by various parties to remediate contamination in the Canal. The USEPA ROD focuses on industrial pollutants, largely from the discharge of tarry wastes from National Grid's three former manufactured gas plants (MGPs) which operated for over a century along the bank of or near the Canal. As part of the USEPA ROD, USEPA also mandated the construction of the CSO Facilities.

Independent of the Project, National Grid is undertaking the investigation and remediation of upland sources of contamination-including Fulton Municipal Works MGP site, Carroll Gardens/Public Place (formerly known as the Citizens Gas Works MGP site), and the Metropolitan MGP site-including properties where the Head End Facility would be sited within National Grid's Remedial Investigation Parcel Boundaries, pursuant to administrative orders under the jurisdiction of the NYSDEC and in coordination with the remediation required under CERCLA. NYSDEC has issued a Record of Decision (NYSDEC ROD) that selected near- and long-term actions intended to prevent the migration of contamination from the former Fulton MGP site into the Canal, protect human health and the environment, and comply with New York State standards, criteria, and guidance. There will be a period between the initial DEP site work at the Head End Site and when the tank is constructed when National Grid is responsible for remediation of the site, including the construction of bulkhead barriers, installation of coal tar extraction wells, and excavation or stabilization of MGP-related contamination.

B. METHODOLOGY

Historic and cultural resources include both archaeological and architectural resources.

ARCHAEOLOGICAL RESOURCES

The study area for archaeological resources consists of the project site itself, comprising all locations where ground surface disturbance is anticipated, including the locations of excavation and construction associated with the two CSO sites, construction staging areas, and any other areas of soil excavation associated with the Project (see Chapter 10, “Hazardous Materials”), and the location of the new force main, sewers, and associated infrastructure (the areas of in-street sewer line improvements, as shown on **Figures 7-1 and 7-10**).[1]

Archaeological investigations typically proceed in a multi-phase process consisting of an initial sensitivity assessment or more intensive studies, including a Phase 1A Archaeological Documentary Study (determining the archaeological potential of a project site through documentary and cartographic research), Phase 1B archaeological testing (determining the presence or absence of archaeological resources through subsurface testing and/or monitoring), Phase 2 (determining the integrity, significance, and S/NR-eligibility of any affected resources), and/or Phase 3 (planning to avoid or minimize effects or mitigating unavoidable impacts through data recovery or some other form of mitigation). In urban settings, these phases are often conducted concurrently and the need for the next phase is dependent upon the results of the preceding phase.

This analysis of archaeological resources that could be affected by the Project consisted primarily of a review of earlier surveys (see below) supplemented by cartographic research and a review of the site files maintained by the New York State Historic Preservation Office (SHPO) accessed through the New York State Cultural Information System (CRIS)[2] and the New York City Landmarks Preservation Commission (LPC). Consultation with LPC and SHPO is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites. In a comment letter dated April 21, 2017, LPC determined that the Project Sites are potentially archaeologically sensitive and recommended that a Phase 1A Archaeological Documentary Study of the sites be prepared (see **Appendix 7-1**). On June 5, 2017, a memorandum was submitted to LPC and SHPO summarizing the results of numerous previous archaeological assessments of the area surrounding the project sites, including reports that had not previously been submitted to LPC for review. Upon the receipt of this additional background information, LPC issued a second comment letter on June 15, 2017 stating that sufficient documentary research had been completed and that a Phase 1A study of the project sites was no longer required (see **Appendix 7-1**). Instead, LPC recommended that a scope of work for further archaeological analysis (e.g., Phase 1B archaeological testing or archaeological monitoring) be prepared once the design of the proposed project is finalized and the full extent of project-related impacts are understood. In a comment letter dated July 3, 2017, SHPO concurred with LPC’s determination that additional documentary research is not needed, but requested additional information regarding subsurface conditions on the project sites (e.g., soil boring logs) as well as additional information regarding the vertical and horizontal extents of project-related impacts (see **Appendix 7-1**). As described below, consultation with SHPO and LPC is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites. Additional archaeological analyses could include archaeological testing, archaeological monitoring, avoidance, or an alternate mitigation strategy developed in consultation with LPC and SHPO.

The chapter summarizes the results of the previous archaeological investigations reviewed by LPC and SHPO (described in greater detail below) and differentiates between the likelihood that prehistoric and historic period activities could have resulted in the formation of archaeological sites (“archaeological sensitivity”) and the potential for those to sites to have remained intact after subsequent development (“archaeological potential”). The archaeological sensitivity of the Project Sites was previously assessed

[1] All figures can be found at the end of the chapter.

[2] https://cris.parks.ny.gov/.

through the completion of three large-scale surveys of the Gowanus Canal and its immediate vicinity. These surveys include the following:[3]

- *National Register of Historic Places Eligibility Evaluation and Cultural Resources Assessment for the Gowanus Canal*, prepared for the United States Army Corps of Engineers (USACE) by Hunter Research, Inc. (Hunter), Raber Associates, and Northern Ecological Associates, Inc. (Hunter, et al. 2004): This report was prepared in association with the feasibility study of the ecosystem restoration of the Gowanus Canal and the Gowanus Bay prepared by the New York District and USACE, and designed to assess the Canal's potential S/NR-eligibility;
- *Archaeological Sensitivity Study, Gowanus Canal*, prepared for the United States Environmental Protection Agency (USEPA) by Hunter Research, Inc. (Hunter) (Lee, et al. 2011): this report was issued as part of an EPA feasibility study associated with the remediation of environmental contamination within the Gowanus Canal; and
- *Gowanus Canal Area Historic Resources Inventory and Limited Phase 1A Documentary & Archaeological Sensitivity Report*, prepared for Friends & Residents of Greater Gowanus (FROGG) by Gregory Dietrich Preservation Consulting and Chrysalis Archaeological Consultants, Inc. (Chrysalis) (Loorya and Dietrich 2012): this report was prepared to support the listing of the S/NR-eligible Gowanus Canal National Register Historic District.

Lee, et al. 2011 provides a thorough summary of the many smaller-scale archaeological surveys that have been completed within the vicinity of the Canal, including portions of the Project Sites.[4] The three studies listed above involved, to various degrees, background research, cartographic analysis, review of available geotechnical borings, review of previously completed archaeological surveys, agency consultation, and coordination with local historians and knowledgeable community members. The results of these surveys are summarized later in this historic and cultural resources analysis (see Section C, "Existing Conditions").

The possibility that human burials associated with a reported mass grave containing the remains of soldiers who were killed during the Battle of Brooklyn was explored in each of the three reports listed above. Additional research on this reported burial ground was compiled in the following report on file with SHPO:

> *Phase 1A Archaeological Documentary Study: Proposed Pre-Kindergarten Center; 168 8th Street, Brooklyn, Kings County, New York.* Prepared by AKRF, Inc. for the New York City School Construction Authority in association with the construction of a proposed pre-kindergarten facility on a vacant lot on the block bounded by 8th and 9th Streets and 4th and 5th Avenues (AKRF 2016).

In addition to the review of previous reports, this analysis included the systematic review of historic maps dating from the 1850s through the 1920s to supplement the previous analyses regarding the mid-19th through early 20th century industrialization and urbanization of the Project Sites.

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[3] The Phase 1A Cultural Resource Assessment prepared for the Gowanus Canal Corridor Rezoning Project (Louis Berger Group 2009) was reviewed but does not include the current project sites in its archaeological study area.

[4] For example, Solecki (1977) examined borings performed along Nevins Street between Butler and President Streets.

ARCHITECTURAL RESOURCES

Study areas for architectural resources are determined based on the area of potential effect for construction period impacts, as well as the larger area in which there may be visual or contextual effects. The 2014 *CEQR Technical Manual* sets the guidelines for the study area as typically being within an approximately 400-foot radius of the Project Sites. Although the Project is located within the S/NR-eligible Gowanus Canal Historic District, it would not have the potential to result in adverse impacts beyond 400 feet of the Project Sites, as the construction of below-grade structures and the associated two-story above-grade Facilities would either not be visible upon project completion or would result in structures of a height in keeping with those of the surrounding structures. Therefore, the study area has been defined as a 400-foot radius surrounding the Project Sites (see **Figures 7-1 and 7-10**). In addition, since proposed below-grade conduits would only have the potential to affect structures located within 90 feet of the affected streetbeds during construction, as described below, a study area for these project elements has been defined as a 90-foot radius from the affected streetbeds.

Within the study area, architectural resources analyzed include S/NR-listed or S/NR-eligible properties, New York City Landmarks (NYCLs), New York City Historic Districts (NYCHDs) and properties pending such designation. In addition, a survey was conducted by an architectural historian to identify any previously undesignated properties that appear to meet S/NR or NYCL eligibility criteria (“potential architectural resources”); no such resources were identified.[5]

Impacts on architectural resources can include both direct physical impacts and indirect impacts. Direct impacts include destruction, demolition, or substantial alterations to an architectural resource, and damage from vibration (e.g., from construction-related blasting or pile driving) as well as from falling objects, subsidence, collapse, or other adjacent construction activity. Adjacent construction is defined as any activity that would occur within 90 feet of an architectural resource, as defined in the New York City Department of Buildings (DOB) *Technical Policy and Procedure Notice* (TPPN) #10/88.[6]

The Project’s potential to result in indirect, or contextual impacts, was also evaluated. Indirect impacts could result from blocking significant public views of a resource; isolating a resource from its setting or relationship to the streetscape; altering the setting of a resource; introducing incompatible visual, audible, or atmospheric elements to a resource’s setting; or introducing shadows over a historic landscape or an architectural resource with sun-sensitive features that contribute to that resource’s significance, such as a church with notable stained-glass windows.

C. EXISTING CONDITIONS

ARCHAEOLOGICAL RESOURCES

As described above, previous archaeological surveys have assessed the archaeological sensitivity of the region surrounding the Gowanus Canal, including the Project Sites. These surveys identified areas of potential sensitivity for five general classes of archaeological resources correlated with five periods of cultural activity: (1) prehistoric (Native American) occupation; (2) 18th century historic settlement; (3)

[5] AKRF Inc., February 15, 2017.

[6] TPPN #10/88 was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. TPPN #10/88 outlines procedures for the avoidance of damage to historic structures that are listed on the NR or NYCLs resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

the Battle of Brooklyn during the Revolutionary War (including both activities associated with the battle itself as well as the potential interment of those who perished during the fight in the vicinity of the battleground); (4) the construction of the Gowanus Canal; and (5) mid-19th through early 20th century industrialization and urbanization. Each of these five periods of cultural activity is summarized below, followed by a discussion of the potential for archaeological resources to be present in each study area.

PERIODS OF CULTURAL ACTIVITY

Prehistoric Occupation

Until the construction of the Gowanus Canal in the mid-19th century, the Project Sites and surrounding vicinity were the location of the low-lying marshy drainage basin of the former Gowanus Creek, a basin with an area of approximately six square miles (Lee, et al. 2011). Within this drainage basin were localized areas of higher elevation that would have been attractive for habitation during the prehistoric period due to the ready availability of various types of food sources. One of these areas is located along the eastern side of what is now the Canal, along Nevins Street and the adjacent blocks (see site H on **Figure 7-1**).

18th Century Historic Settlement

During the 18th century, the marshes adjacent to Gowanus Creek were heavily utilized by salt hay farmers and the area soon became a center of tide-powered milling activity (Lee, et al. 2011). Two tidal mills were located within the vicinity of the Project Sites (see **Figure 7-1**): Denton's Mill, established in 1709, and Brower's (or Freeke's) Mill, established before 1661. The mills appear to have been in operation until sometime between the 1840s and the early 1850s. Features associated with these mill complexes consisted of buildings, dam structures to impede the flow of water through the Creek, and mill ponds. The history of these mills is documented in Lee, et al. 2011. Brower's Mill was located in the vicinity of Blocks 418 and 425 and the portion of Nevins Street adjacent to these two blocks. Brower's Mill is identified as site G on **Figure 7-1**; Denton's Mill was located several hundred feet further to the south and is therefore not depicted on the figures accompanying this analysis.

The Battle of Brooklyn

New York City, including what is now the Borough of Brooklyn, was occupied by the British during the Revolutionary War in the late 18th century. The most prominent battle in the New York region was the Battle of Brooklyn, also known as the Battle of Long Island, which occurred on August 27, 1776. The battle was waged across much of Brooklyn as troops moved throughout the area, and the Project Sites are located within a *Battle Action Corridor* (an area where troop movements may have occurred). There has also been speculation that soldiers from Maryland who died during this battle were buried in a mass grave in the vicinity of the Project Sites, though no primary source materials have been located to confirm this. One frequently cited location for these possible burials is the general area around 7th and 8th Streets between 2nd and 4th Avenues (see site F on **Figure 7-10**).

Gowanus Canal

Plans for the Canal were developed between 1846 and 1847 by Major David B. Douglass, and construction extended from 1853 through 1866 and then more sporadically as improvements were needed through 1904 (Hunter, et al. 2004). Hunter, et al.'s 2004 evaluation of the Canal documented the history of the Gowanus area and delineated a Potential Gowanus Canal Historic District, which the SHPO subsequently determined to be eligible for listing on the S/NR ("2004 historic district"). The Gowanus Canal bulkhead was identified as contributing to the 2004 S/NR-eligible Gowanus Canal Historic District.

According to the 2004 Hunter, et al. report, during the earliest period of Gowanus Canal construction in the 1850s, timber sheet piling was used to create the Canal bulkheads. However, "timber cribwork was the preferred and principal type of Gowanus Canal bulkhead beginning in the mid-1860s, and probably replaced most of the early sheet pile construction" (Hunter, et al. 2004: 3-2). None of the original timber sheet pile construction appears to remain intact today. Timber "cribwork," a log-cabin-like structure used to retain landfill in low-lying areas, is estimated to comprise over 70 percent of the total existing bulkhead along the Canal and extends up to approximately 25 feet inland from the face of the bulkhead. These timber structures are considered S/NR-eligible for their potential to contribute information on vernacular adaptations of a well-established bulkhead form to marsh conditions and are likely present throughout the Project Sites within a distance of approximately 25 feet from the Canal's bulkhead.

Mid-19th through Early 20th Century Industrialization and Urbanization

Once the Canal was completed, the properties adjacent to the Canal were soon developed with numerous buildings used for industrial purposes, including various types of storage yards associated with bulk goods brought up the Canal by barge. Industrial activity became increasingly focused on coal and the production of manufactured gas by the early 20th century. According to Lee, et al.'s 2011 Phase 1A, the potential of these resources to meet S/NR eligibility criteria "is considered to be low, although there are some sites that require further investigation due to higher levels of interest or lack of sufficient in-depth analysis to make a fully justified assessment of potential" (Lee, et al. 2011:4-2). None of the specific sites identified for further investigation by Lee, et al. 2011 are located on the Project Sites. Loorya and Dietrich (2012) conclude that industrial areas have "the potential to inform/provide information about this aspect of Brooklyn and New York City's development" (Loorya and Dietrich 2012:245), although specific locations of sensitivity are not delineated.

Archaeological resources associated with mid-19th through early 20th century industrial activity are expected throughout the Project Sites from approximately 0 to 15 feet below grade.

PROJECT SITES

This section discusses the previously identified archaeological resources and areas of archaeological sensitivity in each of the two study areas.

Head End Study Area

The Head End archaeological study area consists of Block 425, Block 418, and the eastern portion of Block 411 and the streetbed of Nevins Street from the vicinity of its intersection with Butler Street to the vicinity of its intersection with Carroll Street (see **Figure 7-1**).

Previously Identified Archaeological Resources

As stated above, the Head End study area was previously assessed through the completion of three large-scale surveys of the Gowanus Canal and its immediate vicinity. The only previously identified archaeological resources in this study area are the cribbing and bulkheads of the S/NR-eligible Gowanus Canal. These resources are likely present along the length of the Canal within this study area within a distance of approximately 25 feet from the Canal's bulkhead.

Areas of Archaeological Sensitivity

The Head End study area is considered to be sensitive for the presence of the following types of archaeological resources:

- Prehistoric resources that could underlay mid-19th century landfilling that followed construction of the Gowanus Canal. Such resources, if present, would be located in the southern portion of Block 418, Block 425, and the adjacent portion of Nevins Street at depths of approximately 10 to 15 feet below the current grade. Due to intensive development, the potential for prehistoric resources to remain intact in the study area is low.

- Features associated with a mill complex that could underlay mid-19th century landfilling that followed construction of the Gowanus Canal. Such resources, if present, would be located in the southern portion of Block 425 and the streetbed of Nevins Street south of Sackett Street at depths of approximately 10 to 15 feet below the current grade. Due to intensive development, the potential for mill-related resources to remain intact in the study area is low.
- Features associated with mid-19th through early 20th century industrial activity are expected across Blocks 411, 418, and 425 from approximately 0 to 15 feet below grade. Although there is a high likelihood that industrial features are present and intact, there is low likelihood that significant information could be recovered through archaeological methods that could not also be recovered through other methods, such as documentary research.

The extent to which soil contamination may have affected the integrity and research value of archaeological resources is unknown and would be considered if and when archaeological resources are encountered in areas of known or potential contamination.

Owls Head Study Area

The Owls Head archaeological study area consists of Block 977 and the northern portion of Block 990 and the streetbed of 2nd Avenue from the Canal to its intersection with 7th Street and the streetbed of 7th Street from 2nd Avenue to 3rd Avenue (see **Figure 7-10**).

Previously Identified Archaeological Resources

As stated above, the Owls Head study area was previously assessed through the completion of three large-scale surveys of the Gowanus Canal and its immediate vicinity. The only previously identified archaeological resources in this study area are the cribbing and bulkheads of the S/NR-eligible Gowanus Canal. These resources are likely present along the length of the Canal within this study area within a distance of approximately 25 feet from the Canal’s bulkhead.

Areas of Archaeological Sensitivity

The Owls Head study area is considered to be sensitive for the presence of the following types of archaeological resources:

- Although it is likely that the Owls Head study area is located within a Revolutionary War Battle Action Corridor it is unlikely that any evidence of such activities survived subsequent intensive development or is archaeologically recoverable. Similarly, the extent to which the site was developed makes it highly unlikely that intact precontact archaeological resources would be present on the project site.
- Regarding the possibility for the presence of a Revolutionary War mass grave, given the absence of evidence to the contrary, the possibility for the presence of human burials or the remains of human burials beneath the streetbeds in the general area around 7th and 8th Streets between 2nd and 4th Avenues cannot be ruled out. If human remains are present in the streetbeds, they would be considered a significant resource; however, it is likely that they would be disarticulated and in poor condition as a result of historic disturbance and the construction of the utilities currently present beneath the streetbeds. Such remains are expected to be located below mid-19th and 20th century fill layers and modern disturbances.
- Features associated with mid-19th through early 20th century industrial activity are expected across Block 977 and the northern portion of Block 990 from approximately 0 to 15 feet below grade. Although there is a high likelihood that industrial features are present and intact, there is low likelihood that significant information could be recovered through archaeological methods that could not also be recovered through other methods, such as documentary research.

SUMMARY OF POTENTIAL ARCHAEOLOGICAL RESOURCES

Table 7-1 provides a summary of the potential archaeological resources located within the Project Sites that were identified by Hunter, et al. (2011) and Loorya and Dietrich (2012). The table provides both an assessment of the likely significance (or research value) of each potential archaeological resource, and an assessment of the likely current condition (or integrity) of the potential resource.

Table 7-1
Potential Archaeological Resources and Recommendations for Future Analysis

Location within Project Sites	Potential Resource Type	Archaeological Research Value (if present)	Likely Integrity	Recommendation
Head End Site; Nevins Street	Prehistoric Site	High	Low	Archaeological Monitoring
Nevins Street	Tide Mill Complex	High	Low	Archaeological Monitoring
Owls Head Site; 2nd Ave; 7th Street	Battle of Brooklyn (Battle Action Corridor)	Low	Low	No further action[1]
7th Street	Battle of Brooklyn (Soldier Burials)	High	Low	Archaeological Monitoring
Head End Site; Owls Head Site	Gowanus Canal (bulkhead and cribbing)	Moderate	High	Archaeological Monitoring if affected
Head End Site; Owls Head Site	Industrial Sites	Low	High	No further action

Note:
[1] Although the likelihood of encountering Battle Action Corridor-related resources is low, an Unanticipated Discoveries Plan will be in effect during construction.
Sources:
Lee, et al. 2011 and Loorya and Dietrich 2012.

Although the Project Sites are considered sensitive for a variety of classes of potential archaeological resources, the only resource types with a high likelihood of retaining sufficient integrity are industrial resources and cribbing associated with the Canal at both the Head End Site and Owls Head Site. However, although there is a high likelihood that industrial features are present and intact, there is low likelihood that significant information could be recovered through archaeological methods that could not also be recovered through other methods, such as documentary research. In addition, cribbing associated with the Canal has already been examined by several researchers in multiple lots lining the Canal; therefore, additional research on this potential archaeological resource may be redundant and unwarranted.

ARCHITECTURAL RESOURCES

PROJECT SITES

A Gowanus Canal Historic District was proposed for listing on the S/NR by SHPO in 2014. A draft of the National Register of Historic Places Registration (Nomination) Form was prepared by the SHPO in December 2013 (the “Draft National Register Nomination Form”), which identified the proposed Gowanus Canal Historic District as significant in the areas of architecture, engineering, transportation and commerce, with a period of significance spanning from ca. 1853 to ca. 1965. However, in response to community comments, the New York State Board for Historic Preservation review for the State Register listing of the Gowanus Canal Historic District has been postponed. As stated in SHPO’s letter dated August 28, 2017, the SHPO determined the Gowanus Canal Historic District to be S/NR-eligible in 2012 upon completion of a comprehensive survey report of the Gowanus neighborhood prepared by Gregory

G. Dietrich, of Dietrich Preservation Consulting, and Alyssa Loorya, of Chrysalis Archeological Consulting, Inc., for the Friends and Residents of Greater Gowanus, and the survey established a justifiable boundary for the S/NR-eligible historic district (see **Appendix 7-1**).

The S/NR-eligible historic district encompasses 53 blocks and includes properties along portions of 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, Baltic, Bay, Bond, Butler, Carroll, Creamer, Douglass, Halleck, Hoyt, Nevins, President, Sackett, Smith, and Union Streets; Whitwell Place; and 2nd and 3rd Avenues in Brooklyn, NY. The Head End and Owls Head Project Sites are both located in the S/NR-eligible Gowanus Canal Historic District (see **Figures 7-1 and 7-10**).

The Draft National Register Nomination Form provides information regarding the history and construction dates of the buildings within the proposed historic district boundaries. The Draft National Register Nomination Form indicates that buildings are considered Contributing to the significance of the proposed historic district unless otherwise noted and identifies certain buildings as Non-Contributing to the significance of the proposed historic district in the Resource Inventory.[7] However, the Draft National Register Nomination Form does not make a conclusion regarding the number of Contributing and Non-Contributing buildings in Section 5, "Classification" of the Draft National Register Nomination Form, with this section left blank.[8] In subsequent consultation, SHPO in a letter dated July 3, 2017 (see **Appendix 7-1**) provided updated determinations of S/NR eligibility for the properties on the Project Sites, as described in greater detail below.

Head End Site

There are no individually designated or S/NR-listed or eligible resources on the Head End Site. However, as described above, the Head End Site is located within the boundaries of the S/NR-eligible Gowanus Canal Historic District. The architectural features of the buildings located on the Head End Site are characterized below.

Block 425, Lot 1 (270 Nevins Street) is a one-story warehouse that occupies the entire block on the west side of Nevins Street between Sackett and Degraw Streets. As described in the Draft National Register Nomination Form, this building was built ca. 1955 and is brick-clad. Multi-light windows cover the majority of the mid-section of the building and have metal security guards covering them. The three street-facing façades have entryways that have metal roll-down doors; the west façade fronts the Gowanus Canal and is a low concrete structure with small window openings and a metal roll-down door. The building has a flat roof with a stepped parapet on the north and south façades (see **Figures 7-2 and 7-3**). The building is identified as Contributing in the Draft National Register Nomination Form, although it has been altered through the sealing of windows and other openings with concrete and concrete block, including a large section of windows on Nevins Street, as well as through the installation of non-original metal roll-down doors. It is an industrial building of a type commonly found throughout New York City. The draft National Register Nomination Form characterizes the building as a "utilitarian factory."[9] In their letter dated July 3, 2017, SHPO determined that this building continues to contribute to the S/NR-eligible Gowanus Canal Historic District.

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[7] Draft National Register of Historic Places Registration Form, Gowanus Canal Historic District, December 2013, Section 7, p.6.

[8] Ibid, Section 5, p. 2.

[9] Draft National Register of Historic Places Registration Form, Gowanus Canal Historic District, December 2013, Section 7, p. 56.

Block 418, Lot 1 (242-244 Nevins Street) is occupied by a factory complex of four buildings built ca. 1905, 1920, 1940, and 1955, as described in the Draft National Register Nomination Form. At the southwest corner of Lot 1 is a one-story L-shaped brick warehouse with a flat roof and a small parapet. The east (primary) façade fronting on Nevins Street has four large, non-original metal roll-down doors and a smaller entrance with a non-original metal door. Larger window openings have been sealed and infilled with brick along this façade. The south façade fronts on Degraw Street and has a 1980 storefront addition with an aluminum and glass door, transoms, and display windows. The west portion of Lot 1 is occupied by a building that the Draft National Register Nomination Form indicates was built ca. 1955. It has three front gable sections that have subsequently been parged in stucco. An adjacent one-story building with a flat roof is also clad in stucco, and has a parapet patched in wood, as well as a corrugated metal roof. North of this building is a parking lot that separates the large, one-story warehouse described above from a two-story brick building that fronts Nevins Street, which was built ca. 1905 (according to the Draft National Register Nomination Form) but which has a more modern appearance. This two-story building has three narrow bays and two garage openings with modern, metal roll-down doors (see **Figures 7-4 and 7-5**). Overall, the complex consists of industrial buildings which have been altered. The Draft National Register Nomination Form identifies these buildings as Contributing and characterizes the buildings as a "utilitarian factory complex."[10] In their letter dated July 3, 2017, SHPO determined that these buildings continue to contribute to the S/NR-eligible Gowanus Canal Historic District.

Block 411, Lot 24 (234 Butler Street) includes the former Gowanus Station. As described in the Draft National Register Nomination Form, the Gowanus Station is a vernacular two-story industrial building designed in the Beaux Arts style. The building's windows have scrolled keystones with segmental-arched lintels. The window openings have been infilled with brick on the Butler Street façade and on the ground floor of the Nevins Street façade. The building has a side gabled roof. Within the gable that fronts on Nevins Streets is a terra cotta panel that reads "City of New York, Water Supply-Distribution, Gowanus Station" (see **Figure 7-6**). Above the panel is the Seal of New York City, bordered by a terra cotta surround. Additional one-story sections extend along Butler and Nevins Streets; these have segmental window openings with scrolled keystones that have been infilled with brick.

The draft National Register Nomination Form indicates that the two-story building was built ca. 1926.[11] However, the City of New York's Department of Water Supply, Gas, and Electricity for the Borough of Brooklyn prepared contract drawings for the construction of buildings at the Gowanus Pipe Yard in September 1913 with construction completed in 1914. A review of historic maps indicates that there was a two-story frame office building at the corner of Butler and Nevins Streets by 1886 labeled as an office and dwelling for a "watchman," but which extended for a shorter length on Butler Street than the existing two-story building. The property is identified on the 1886 Sanborn map as a lumber yard. The 1903 Hyde map shows this frame building and labels the block on which it is situated, along with other frame one-story buildings, as occupied by "Department of Water Supply." The 1904 Sanborn map labels the block as "D.C.W. Borough of Brooklyn City Pipe Yard" (with D.C.W. likely indicating the Department of City

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[10] Ibid.

[11] Draft National Register of Historic Places Registration Form, Gowanus Canal Historic District, December 2013, Section 7, p. 45.The 1926 date appears to have been derived from the *Gowanus Canal Area Historic Resources Inventory and Limited Phase 1A Documentary & Archaeological Sensitivity Report*, prepared for FROGG by Gregory Dietrich Preservation Consulting and Chrysalis Archaeological Consultants, Inc. (Loorya and Dietrich 2012). Dietrich is also the author of the December 2013 Draft National Register Registration Form for the Gowanus Canal Historic District.

Works) with the two-story frame "Watchman's Office" at the corner of Butler and Nevins Streets. The 1886, 1903, and 1904 maps show a one-story frame building identified as a lumber shed and a pipe shed extending along Nevins Street. The 1913 contract drawings show a two-story brick building with a one-story brick section along Butler Street, and an additional one-story brick structure along Nevins Street. There is also an approximately 16-foot-wide gated opening between the two-story building and the one-story building along Nevins Street. The 1913 elevation drawings for Butler and Nevins Streets correspond to the design of the buildings presently on the site. These 1913 drawings depict space dedicated to general storage, wagon washing, and storage as well as department offices, stables, a hay loft, and washrooms. A 1916 Hyde map depicts the two-story building corresponding to its current configuration and a one-story building on Nevins Street as wood frame clad in brick, which corresponds with the existing one-story building on Nevins Street, including the opening between the two-story building and one-story building along Nevins Street.

In 1921, alterations were made to a section of the one-story stables along Butler Street, replacing them with new garage space, with new steel rolling doors proposed for installation of the south (rear) façade of that portion of the building. The 1926 Certificate of Occupancy on file at DOB indicates that the property contained an existing building that was owned by the Department of Water Supply, Gas and Electricity and was utilized for offices, storage, and a garage. In 1930, the one-story building along Nevins Street was widened to the rear by an additional nine feet. By 1939, the Sanborn map of that year shows the block occupied by the "D.C.W. Borough of Brooklyn" with the two-story building identified as an office with storage along Butler Street. The one-story building on Nevins Street is identified as "wagon sheds" with the area adjacent to these buildings labeled as D.C.W. Borough of Brooklyn's storage yard. These two- and one-story buildings contribute to the significance of the S/NR-eligible Gowanus Canal Historic District, as described in information DEP provided to SHPO on June 5, 2017 and as indicated in SHPO's July 3, 2017 letter. A one-story building, located in the interior of the site towards Butler Street is a utilitarian one-story brick building that was built ca. 1990. The Draft National Register Nomination Form does not indicate that the 1990 building is Non-Contributing in the historic district, although it is outside the period of proposed significance for the historic district (post-1965), and is therefore assumed to be Non-Contributing.

For the Head End Site overall (with the exception of the ca. 1990 building), the buildings on the Head End Site at 242-244 Nevins Street, 270 Nevins Street, and 234 Butler Street are Contributing to the significance of the S/NR-eligible Gowanus Canal Historic District. In a letter dated November 29, 2017 LPC indicated that they do not identify the buildings at 242-244 Nevins Street, 270 Nevins Street, and 234 Butler Street as LPC eligible (see **Appendix 7-1**).

Owls Head Site

Block 990, Lot 1 contains a complex of one-story industrial buildings (with the addresses 22-36 2nd Avenue and 114-132 5th Street), two of which have low-pitched, gabled metal-corrugated roofs; others have flat roofs. These buildings have metal roll-down doors that cover large vehicular entrances to the buildings (see **Figures 7-12 and 7-13**). The buildings were constructed either in 1935 and altered in 1955 or built in 1955, as described in the Draft National Register Nomination Form. They have been altered through the sealing of a variety of window openings with concrete block and modern metal roll-down doors. The Draft National Register Nomination Form identifies the buildings as Contributing and characterizes the buildings as a "utilitarian warehouse complex."[12]

[12] Draft National Register of Historic Places Registration Form, Gowanus Canal Historic District, December 2013, Section 7, p. 8.

Block 990, Lot 16 (110 5th Street) contains two utilitarian one-story warehouses that were built ca. 1935 and 1970, as described in the Draft National Register Nomination Form. The buildings have large entrances with metal roll-down doors fronting onto 5th Street and flat roofs (see **Figure 7-13**). The buildings have been altered through the parging of the façades with stucco and the insertion of modern roll-down metal doors. The Draft National Register Nomination Form identifies the buildings as Contributing but characterizes the buildings as "utilitarian warehouses"[13]. The Draft National Register Nomination Form also does not indicate that the 1970 building is non-contributing in the historic district, although it is outside the period of proposed significance for the historic district (post-1965).

Block 977, Lot 1 is a privately owned streetbed with no structures.

Block 977, Lot 3 (2 2nd Avenue) is owned by the New York City Department of Sanitation (DSNY) and is located along the southern side of the Gowanus Canal as it bends toward the west near the 4th Street turning basin. The property is primarily a storage yard for road salt and snow plows, and contains a recently constructed salt shed (see **Figures 7-14 and 7-15**) and community sponsored composting operations. This property is not identified in the Draft National Register Nomination Form, as there were no structures on the site at the time of the proposed Gowanus Canal Historic District nomination.

Block 990, Lot 21 contains no structures and is used for tour bus parking.

Overall, the buildings on the Owls Head Site are utilitarian structures that are not distinguished architecturally and do not appear to possess any particular historical significance or significant association with the Gowanus Canal. SHPO concurred in their July 3, 2017 letter that the buildings on the Owls Head site are Non-Contributing to the S/NR-eligible Gowanus Canal Historic District. This determination supersedes the determination of Contributing status as contained in the 2013 Draft National Register Nomination Form.

Head End Site Study Area

As described above, the Head End Site study area is located within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District. In addition, there are seven known architectural resources that have been previously determined individually S/NR-eligible in the Head End Site study area. No potential architectural resources were identified in the Head End Site study area.[14]

Prior to the 2014 Gowanus Historic District mentioned above, a separate, smaller historic district was determined S/NR-eligible by SHPO in 2004 and this historic district has been subsumed into the expanded S/NR-eligible 2014 Gowanus Canal Historic District (see **Figures 7-1 and 7-10)**.[15] This smaller district comprises the Gowanus Canal channel and associated structures, including several buildings and bridges. Collectively the Gowanus Canal bulkheads are a contributing resource within the historic district. In addition, certain individual buildings located along and in the vicinity of the Canal were also identified as contributing to the historic district. Two contributing architectural resources—the Pumping Station and the Flushing Tunnel—are located in the Head End Site study area. These two resources are also individually S/NR-eligible resources per SHPO's CRIS.

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[13] Ibid, p. 25.

[14] In comments dated June 30, 2017 LPC indicated that the Carroll Street Bridge is a designated NYCL. The Carroll Street Bridge is located outside the 400-foot study area.

[15] The S/NR-eligibility determination was based on SHPO's review of the 2004 report *National Register of Historic Places Eligibility Evaluation and Cultural Resources Assessment for the Gowanus Canal* that was prepared by USACE.

Pumping Station (S/NR-eligible, NYCL-eligible)

The Pumping Station is a Romanesque Revival-style building built ca. 1905-1911. It is located at 196 Butler and 201 Douglass Streets. The double-height, one-story Pumping Station is faced in brown brick that is laid in running bond. It has a central arched entrance with a cast-stone pediment and cast-stone detailing below the gambrel-front roof. The Flushing Tunnel (S/NR-eligible) is a 6,280-foot-long below-grade brick tunnel that connects the Gowanus Canal to New York Harbor. The Tunnel entrance opens from the Gowanus Canal. The Pumping Station and Tunnel are located on a site bounded by a high brick wall with arches and keystones fronting on Butler Street and a metal fence fronting on Douglass Street. In addition to contributing to the 2004 S/NR-eligible Gowanus Canal Historic District, both structures are also located within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District. In comments dated June 30, 2017, LPC determined that the Pumping Station appears NYCL-eligible. The Pumping Station and Tunnel are located approximately 120 and 100 feet west of the Head End Site, respectively (**see Figure 7-7**).

Gate House (S/NR-eligible)

The Gate House is a small, one-story Romanesque Revival-style building with a square footprint located south of the Pumping Station. It is has brown brick façades laid in running bond. The building has a corbeled brick cornice and a metal hipped roof. The building has single and multi-light metal-sash windows. Located within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District, this building is also identified in CRIS as individually S/NR-eligible. This building is located approximately 120 feet west of the Head End Site (**see Figure 7-7**).

~~*190 Butler Street (S/NR-eligible)*~~

~~190 Butler Street is a three-story tenement building that was built ca. 1900. The building has a central entrance and a set of low concrete stairs with a non-original metal handrail. The building is faced in vinyl siding (non-original) and has four window bays with one-over-one non-original window sash. Although this building is within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District, the Draft National Register Nomination Form identifies it as Non-Contributing. However, the building is individually S/NR-eligible according to CRIS. The building is located approximately 240 feet west of the Head End Site (**see Figure 7-7**).~~[16]

ASPCA Memorial Building (S/NR-eligible)

The ASPCA Memorial Building is located at 233 Butler Street. Built ca. 1913 and altered in 1922 with a side (east) addition, this is a two-story Romanesque Revival-style brick building with Flemish bond brick façades and Romanesque detailing. The primary entrance has a non-original metal and glass replacement door set within a cast-stone door surround. Above the entrance is a decorated frieze inscribed with the words “The Rogers Memorial,” with two carved floral decorations. Above the entablature is a carved illustration inscribed with “The American Society for the Prevention of Cruelty to Animals.” Flanking the primary entrance are two large arched entryways, one of which has transom openings. These openings have non-original metal roll-down doors. The arched entryways are each flanked by sets of four-over-four sash windows. The second floor has one-over-one sash windows under fixed lights. The cornice has Romanesque detailing, including scalloped fascia and corbeled brick that surround decorative diamond tiles. Located within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District, this building is also identified in CRIS as individually S/NR-eligible. This building is located approximately 60 feet north of the Head End Site (see **Figure 7-8**).

[16] As per SHPO’s letter of October 19, 2017, 190 Butler Street is a non-contributing building in the S/NR-eligible Gowanus Canal Historic District.

R.G. Dunn and Company Building (S/NR-eligible)
The former R.G. Dunn and Company building is located at 255 Butler Street. It is a four-story concrete building, built ca. 1914, that occupies the northwest corner of the intersection of Nevins and Butler Streets. Most of the ground floor has been altered, with loading docks and window openings on both Butler and Nevins Streets infilled and painted. The second through fourth floors have window bays containing three-over-three sash windows. The window bays have an arch at the fourth floor. The corners of the building extend slightly above the parapet height of the rest of the building. The second and third floor windows appear to have original window sash, while the fourth floor windows have been substantially altered with fully and partially infilled window openings. A sidewalk shed extends around the street façades at the second floor. Located within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District, this building is also identified in CRIS as individually S/NR-eligible. It is located approximately 60 feet north of the Head End Site (**see Figure 7-8**).

Union Street Bridge (S/NR-eligible)
The Union Street Bridge was constructed in 1905. It is a double-leaf rolling bridge designed by American engineer William Scherzer. The bridge is supported by wooden timber abutments and has two vehicular traffic lanes which carry eastbound traffic. It has a combination of open-steel grid and steel-reinforced concrete deck, and two sidewalks that are bordered by metal railings. Located within the boundaries of the S/NR-eligible 2014 Gowanus Canal Historic District, this building is also identified in CRIS as individually S/NR-eligible. The bridge is located approximately 250 feet south of the Head End Site (**see Figure 7-9**).

Owls Head Site Study Area

As described above, the Owls Head Site study area is located within the boundaries of the 2014 S/NR-eligible Gowanus Canal Historic District. In addition, there are three architectural resources that have been determined individually S/NR-eligible in the Owls Head Site study area. No potential architectural resources were identified in the Owls Head Site study area.

Third Street Bridge (S/NR-eligible)
The Third Street Bridge was also designed by American engineer William Scherzer. It is a double-leaf rolling lift bascule bridge with wooden timber abutments. It supports two vehicular traffic lanes on a steel-grid deck and has two concrete sidewalks. The bridge was built in 1905 and reconstructed in 1986, and is considered a non-contributing resource as per the Draft National Register Nomination Form for the proposed 2014 Gowanus Canal Historic District. However, the bridge is identified in CRIS as individually S/NR-eligible. It is located approximately 300 feet north of the Owls Head Site (**see Figure 7-15**).

Leonhard Michel Brewing Company Complex (S/NR-eligible)
The Leonhard Michel Brewing Company Complex is located at 409-411 Bond Street. This complex contains two large industrial buildings. At the southeast corner of the intersection of Bond and 3rd Streets is a three-story Art Deco-style brewery building that was built ca. 1935. The buff-colored brick façades are laid in Flemish bond. A sidewalk shed extends around the building's first floor. The second and third floors have multi-light metal sash windows. The roof is flat with a stepped parapet and a saw-tooth frieze. The other building in the complex is located immediately to the south. The six-story warehouse building with a raised basement was built ca. 1906 and designed in the Romanesque Revival-style. It was built as part of the brewery complex. It is faced in red brick and has four window bays on its Bond Street façade. A sidewalk shed extends along the first floor. The third, fourth, and fifth floors have one-over-one windows, with some window openings infilled with brick. The top floor has a corbeled brick cornice and corbeled brick pilasters. Located within the boundaries of the S/NR-eligible 2014 Gowanus Canal

Historic District, this building complex is also identified in CRIS as individually S/NR-eligible. The building complex is located approximately 110 feet north of the Owls Head Site (**see Figure 7-15**).

Kentile Building Complex (S/NR-eligible)
The Kentile Building Complex located at 83-125 9th Street is an industrial complex of offices, factories, warehouses, and garages. The buildings in the complex were built in three phases—1920, 1949, and 1955. The two-story buildings are faced in red and brown brick, with the northernmost section of the building painted sky blue. The buildings have large garage entrances with roll-down metal doors and smaller entrances with metal and glass doors. The building's 2nd Avenue façade has corbeled brick work surrounding some of the smaller entrances. There are multiple styles of windows at the first and second floors, including one-over-one light metal sash and multi-light. Many windows are covered with metal grates. The Draft National Register Nomination Form for the Gowanus Canal Historic District describes the building as a "utilitarian factory." The building at 58 2nd Avenue was built in ca.1980. A metal "Kentile Floors" sign that was erected ca. 1949 and mounted on top of a one-story rooftop structure was removed from the building in 2014. Per March 2017 comments from SHPO, the Kentile Building is still considered a contributing resource to the S/NR-eligible Gowanus Canal Historic District. The Kentile Building is also identified in CRIS as individually S/NR-eligible. The Kentile Building is located approximately 150 feet south of the Owls Head Site (see **Figure 7-16**).

D. FUTURE CONDITIONS IN THE ANALYSIS YEAR

PROJECT SITES

As described previously, there will be a period between the initial DEP site work at the Head End Site and when the CSO Facility is constructed when National Grid is responsible for remediation of the site, including the construction of containment walls, installation of coal tar extraction wells, and excavation or stabilization of MGP-related contamination. National Grid's work at the Head End Site, which is independent of the Project, will be conducted pursuant to administrative orders under the jurisdiction of the NYSDEC in coordination with the remediation required under CERCLA, and must comply with New York State standards, criteria, and guidance. In addition, the bulkhead at the Owls Head Site would likely be stabilized prior to any in-water remediation activities conducted by National Grid in the Canal pursuant to the USEPA ROD. Thus, it is expected that archaeological resources on the Project Sites, including the USEPA-required installation of containment/cutoff walls at the Head End Site by National Grid, and the stabilization of the Owls Head Site bulkhead, would be assessed and documented by others pursuant to CERCLA and any relevant environmental review legislation in the future.

ARCHITECTURAL RESOURCES STUDY AREA

As shown in Figure 2-5 of Chapter 2, "Land Use, Zoning, and Public Policy," three commercial projects are currently planned or under construction in the Head End Site Study Area. One of the projects, located immediately to the north of the Head End Site at 239 Butler Street, involves enlarging and converting a former manufacturing building into a 162-room hotel. A second project at 489 Baltic Street would create a smaller hotel (15 rooms). Finally, a project at 188 Butler Street would create a new 4,600-square-foot (sf) office building.

As shown in Figure 2-5 of Chapter 2, "Land Use, Zoning, and Public Policy," four projects are currently planned or under construction in the Owls Head Site Study Area. One project, east of the Owls Head Site at 163 6th Street, is an approximately 76,000-sf self-storage facility. The remaining three planned projects are all located on the western side of the Canal and would introduce new commercial and/or manufacturing space, including the conversion of former manufacturing or warehouse buildings (located at 124 3rd Street and 62 4th Street) into office and retail space.

All seven projects currently planned or under construction are located within the boundaries of the S/NR-eligible Gowanus Canal Historic District that was proposed in 2014 but did not go forward. The project at 239 Butler Street would additionally make alterations to a property determined individually S/NR eligible by SHPO, the former R.G. Dunn and Company Building, potentially resulting in adverse impacts to this property if the alterations are not reviewed by SHPO. The project at 124 3rd Street would also make alterations to an individually S/NR eligible resource, the Leonhard Michel Brewing Company Complex, potentially resulting in adverse impacts to this property if the alterations are not reviewed by SHPO.

E. PROBABLE IMPACTS OF THE PROJECT

As discussed in Chapter 1, "Project Description," the Project would result in the demolition of the existing buildings on the Head End Site and construction of the Head End Facility. The Facility would consist of a below-grade structure containing an eight million gallon (MG) CSO control system and associated infrastructure, and an above-grade 25,700-sf, two-story structure. The above-grade structure would be located at the northern end of the site, with the remainder of the surface area of the site expected to be paved and accessible for maintenance and operations with landscaping where appropriate. The design would include a 50-foot setback from the bulkhead wall, and would provide some form of waterfront public access to the Gowanus Canal.

Also as discussed in Chapter 1, "Project Description," the Project would remove the existing buildings on the Owls Head Site and construct the Owls Head Facility. The Facility would include a below-grade structure containing a four-MG CSO control system and an approximately 17,600-sf, two-story above grade structure located on the eastern end of the site along 2nd Avenue. Construction of the Owls Head Facility would include replacement of the existing bulkhead. A new force main would be constructed to connect the Owls Head Facility to the Owls Head Interceptor. The remainder of the Owls Head Site is expected to be paved and accessible for maintenance and operations with landscaping where appropriate. The design would include a 40-foot setback from the bulkhead wall.

ARCHAEOLOGICAL RESOURCES

Head End Site

Ground surface impacts from the Project would consist of excavation associated with construction. Potential in-street sewer line improvements would be constructed in the vicinity of the Head End Site beginning on Butler Street, north of the site, and continuing southward along Nevins Street to Sackett Street, with some street work on Degraw Street between Nevins Street and the Canal to connect the Head End Facility with the RH-038 outfall. The new sewer would have a diameter of up to 54 inches. Portions of the Head End Site and Nevins Street are sensitive for deeply buried prehistoric and mill-related resources at depths greater than 10 to 15 feet below grade. The Head End Site is also sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature. If these resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact on archaeological resources. Impacts would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC (see below). As the Gowanus Canal bulkheads are S/NR-eligible, modification of the bulkhead at the Head End Site would result in a potential significant adverse impact. Therefore, consultation with SHPO and LPC is being undertaken to identify measures to avoid, minimize, or mitigate adverse impacts.

Owls Head Site

Ground surface impacts from the Project would consist of excavation associated with construction. Ground surface impacts are also expected along 2nd Avenue and 7th Street associated with potential in-street sewer line improvements. The Owls Head Site is sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature.

Undisturbed portions of the 7th Street streetbed are sensitive for the presence of human remains associated with the Battle of Brooklyn. If human burials or the remains of human burials are present on the Owls Head Site, they would likely be disarticulated and in poor condition as a result of historic disturbance and the construction of the utilities currently present on this site. Any remains are expected to be located below 20th century fill layers and modern disturbances. If archaeological resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC

As the Gowanus Canal bulkheads are S/NR-eligible, removal and replacement of the bulkhead at the Owls Head Site would result in a potential significant adverse impact. Therefore, consultation is being undertaken with SHPO and LPC to identify measures to avoid, minimize, or mitigate adverse impacts.

Future Archaeological Analyses

Recommendations for future archaeological analyses are presented in **Table 7-1**. As described in Section B: Methodology, consultation with SHPO and LPC is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites. As discussed above, additional research on these potential archaeological resources may be redundant and unwarranted, therefore, an archaeological monitoring plan will be prepared that will identify the horizontal and vertical locations of Project elements that have the potential to impact archaeological resources and will describe monitoring procedures, including an unanticipated discoveries plan. Implementation of this monitoring plan would be sufficient to avoid, minimize, or mitigate adverse impacts of the Project.

ARCHITECTURAL RESOURCES

PROJECT SITES

Head End Site

Demolition of S/NR-eligible properties would constitute a significant adverse impact to architectural resources on the Project Site and to the S/NR-eligible Gowanus Canal Historic District. As described above, the Head End Site is located within the boundaries of the S/NR-eligible ~~a proposed 2014~~ Gowanus Canal Historic District ~~that did not go forward but was subsequently determined S/NR-eligible by SHPO~~.

The buildings at 242 Nevins Street, 270 Nevins Street and 234 ~~Nevins~~ Butler Street (that include the two-story former Gowanus Station and associated one-story extensions on Butler and Nevins Streets), contribute to the significance of the S/NR-eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that ~~and~~ their demolition, which is necessary to complete the Project as mandated by USEPA, would constitute a significant adverse impact to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR~~architectural resources~~.

As described above, the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from USACE or equivalencies from USEPA). As such, the Project is subject to Section 106 of the NHPA. Here, the NHPA requires that USEPA take into account the effects of the Project on historic properties and requires consultation with SHPO. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA, in consultation with SHPO and the City, will seek ways to minimize~~,~~ or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

~~Therefore~~ Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to ~~avoid or~~ minimize ~~the~~ to the extent practicable the adverse impact that would occur through demolition, as described below.

Feasibility of Retention of Buildings at Head End Site and Potential Mitigation

As discussed in Chapter 1, "Project Description", the Project is mandated by the USEPA to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). USEPA's Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery (Settlement Agreement) directs DEP to construct the Head End Facility at the recommended location (i.e. the Head End Site).

The preferred and proposed layout of the below-grade CSO structure at the Head End Site extends from the property line in the North facing Butler Street, to the property line in the South facing Degraw Street, to the property line in the East facing Nevins Street, and to the USEPA-mandated 50-foot setback from the Canal to the West. This layout provides for a shallower, larger footprint that has key benefits to facility operations and both the construction cost and schedule. DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, and as discussed above, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential to~~incorporate some ~~salvage~~salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

Owls Head Site

As has been described above, the buildings on the Owls Head Site are utilitarian structures that are not distinguished architecturally and do not contribute to the significance of the 2014 S/NR-eligible Gowanus Canal Historic District. Therefore, demolition of the buildings on the Owls Head Site would have no significant adverse impacts on architectural resources.

STUDY AREA

Head End Site Study Area

Two individually S/NR-eligible architectural resources are located within 90 feet of the Head End Site: the ASPCA Memorial Building and the Former R.G. Dunn and Company Building. To avoid any inadvertent construction-related impacts to these resources during project construction, a Construction Protection Plan (CPP) would be prepared and implemented in consultation with SHPO and LPC and in conformance with DOB's TPPN #10/88. In addition, other properties located within the S/NR-eligible Gowanus Canal are located within 90 feet of the Head End Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken among DEP and SHPO to determine what protection measures may be needed for these properties during construction of the Project.

Demolition of the buildings at 242-244 Nevins Street, 270 Nevins Street, and the Gowanus Station at 234 Nevins Street and associated one-story sections would constitute an adverse impact on the S/NR-eligible Gowanus Canal Historic District. The proposed below-grade CSO Facility and the two-story building would not be expected to have any indirect, contextual impacts on the surrounding architectural resources in the study area as the Project would result in a low-rise industrial facility and paved area similar to other properties in the 2014 S/NR-eligible Gowanus Canal Historic District.

Owls Head Site Study Area

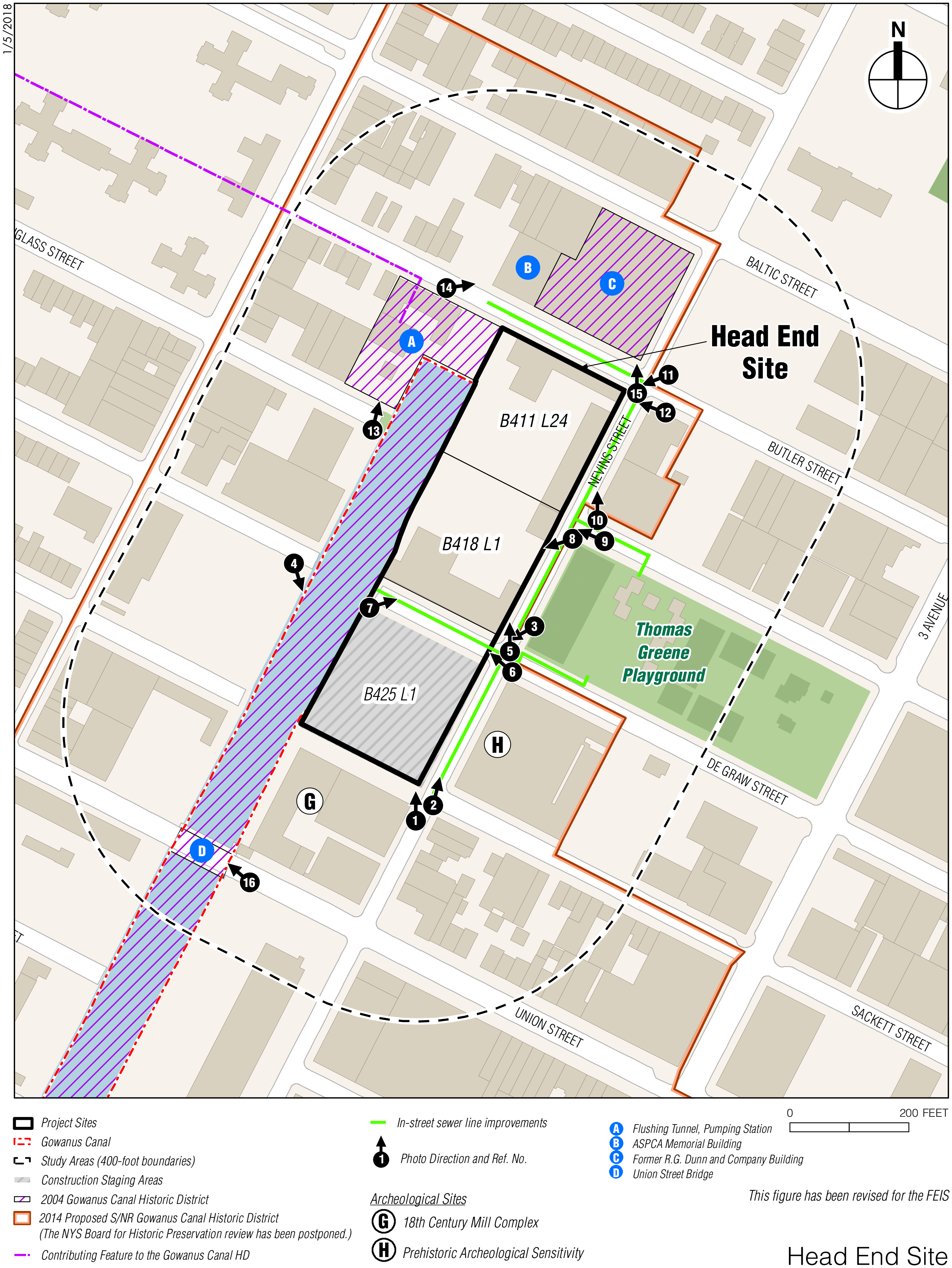
There are no individually S/NR-eligible architectural resources within 90 feet of the Owls Head Site. Properties located within the 2014 S/NR-eligible Gowanus Canal Historic District are located within 90 feet of the Owls Head Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken among DEP and SHPO to determine what protection measures may be needed for these properties during construction of the Project.

The Project, a proposed below-grade CSO Facility and above-grade building would not have any indirect, contextual impacts on architectural resources in the study area as it would result in a low-rise industrial facility and paved area similar to other properties in the 2014 S/NR-eligible Gowanus Canal Historic District.

Force Mains and Sewers

Potential in-street sewer line improvements would be constructed in the vicinity of the Head End and Owls Head Sites. These improvements would be constructed within the boundaries of the 2014 S/NR-eligible Gowanus Canal Historic District, and also within 90 feet of properties that have been identified as individually S/NR-eligible, including the Pumping Station, the ASPCA Memorial Building, the former R.G. Dunn and Company Building, and the Kentile Building Complex. Consultation is being undertaken among DEP and SHPO to determine what additional protection measures may be required for these properties to supplement standard DEP procedures for undertaking such construction. In addition, if there are any Belgian block pavers on the surface of city streets that would be affected during Project construction, DEP, to the extent practicable and feasible, would salvage and reinstall usable pavers, or replace any unusable ones in kind. ✷

1/5/2018



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Gowanus Canal CSO Facilities

Head End Site
Figure 7-1

Block 425, Lot 1 (270 Nevins Street)—View northwest from Nevins and Sackett Streets **1**

Block 425, Lot 1 (270 Nevins Street)—View northwest on Nevins Street **2**

Block 425, Lot 1 (270 Nevins Street)—View southwest from Degraw and Nevins Streets **3**

Block 425, Lot 1 (270 Nevins Street)—View southeast across the Gowanus Canal **4**

Block 418, Lot 1 (242–244 Nevins Street)—View northwest from Degraw and Nevins Streets **5**

Block 418, Lot 1 (242–244 Nevins Street)—View northwest on Degraw Street from Nevins Street **6**

Block 418, Lot 1 (242–244 Nevins Street)—View northeast on Degraw Street **7**

Block 418, Lot 1 (242–244 Nevins Street)—View southwest from Nevins Street **8**

Block 418, Lot 1 (242–244 Nevins Street)—View northwest from Nevins Street **9**

Block 411, Lot 24 (234 Butler Street)—View northwest from Nevins and Douglass Streets **10**

Terra cotta plaque **12**

Block 411, Lot 24 (234 Butler Street)—View southwest from Butler and Nevins Streets **11**

Pumping Station and Gate House—196 Butler and 201 Douglass Streets **13**

This figure has been revised for the FEIS

Head End Site—Study Area

Figure 7-7

ASPCA Memorial Building—233 Butler Street **14**

R.G. Dunn and Company—255 Butler Street **15**

This figure has been revised for the FEIS

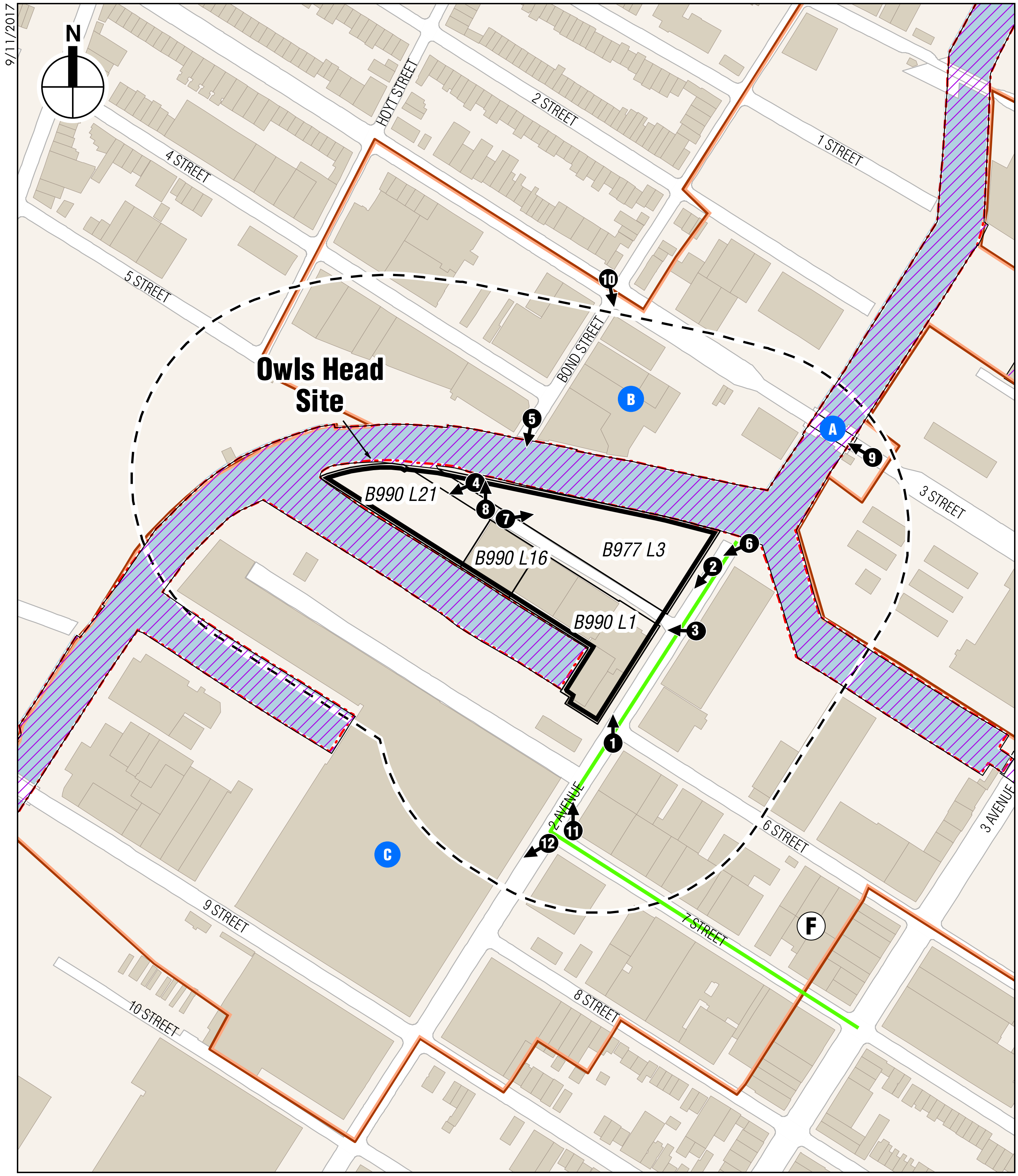
Head End Site—Study Area
Figure 7-8

Union Street Bridge—Union Street facing west toward the Gowanus Canal **16**

This figure has been revised for the FEIS

Head End Site—Study Area

Figure 7-9



Project Sites
Gowanus Canal
Study Areas (400-foot boundaries)
In-street sewer line improvements

2004 Gowanus Canal Historic District
2014 Proposed S/NR Gowanus Canal Historic District (The NYS Board for Historic Preservation review has been postponed.)

A Third Street Bridge
B Leonard Michel Brewing Company Complex
C Kentile Floors Complex

0 200 FEET

Archeological Sites
F Possible Revolutionary War Burial Ground Site

1 Photo Location and Ref No.

Gowanus Canal CSO Facilities

Owls Head Site
Figure 7-10

Block 990, Lot 1 (22–36 2nd Avenue)—View northwest on 2nd Avenue from 6th Street **1**

Block 990, Lot 1 (22 2nd Avenue)—View southwest on 2nd Avenue looking toward 5th Street **2**

Block 990, Lot 1 (22 2nd Avenue and 114-136 5th Street)—View southwest on 5th Street **3**

Block 990, Lot 1 (110 5th Street)— View southwest from 5th Street **4**

Owls Head Site
Figure 7-12

Block 977, Lot 3 (2 2nd Avenue)—View southeast across the Gowanus Canal to 2nd Avenue **5**

Block 977, Lot 3 (2 2nd Avenue)—View southwest on 2nd Avenue **6**

Block 977, Lot 3 (2 2nd Avenue)—View northeast east on 5th Street **7**

Block 977, Lot 3 (2 2nd Avenue)—View northwest from 5th Street **8**

Owls Head Site

Figure 7-14

Third Street Bridge—View west across the bridge over the canal **9**

409–411 Bond Street—Leonard Michel Brewing Company Complex **10**

Owls Head Site—Study Area

Figure 7-15

Kentile Floors Complex—83–125 9th Street—View northwest on 2nd Avenue **11**

Kentile Floors Complex—83–125 9th Street—View southwest on 2nd Avenue **12**

Chapter 8: Urban Design and Visual Resources

A. INTRODUCTION

Under the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, urban design is defined as the totality of components that may affect a pedestrian's experience of public space. These components include streets, buildings, visual resources, open spaces, natural resources, and wind. An urban design assessment under CEQR must consider whether and how a project may change the experience of a pedestrian in a project area. A preliminary assessment of urban design and visual resources is appropriate when there is the potential for a pedestrian to observe, from the street level, a physical alteration beyond that allowed by existing zoning. Examples include projects that permit the modification of yard, height, and setback requirements, and projects that result in an increase in built floor area beyond what would be allowed "as-of-right" or in the future without the project.

Although the Project complies with existing zoning regulations and, per the *CEQR Technical Manual*, does not require an analysis of urban design and visual resources, the following analysis was prepared because the Project would result in physical changes to the Head End and Owls Head Sites that would be observable by pedestrians. The analysis includes a description of existing conditions within 600 feet of the Head End Site and the Owls Head Site, consistent with the study areas used for the land use analysis (see **Figures 8-1a and 8-1b**) and describes the Project's effect on urban design characteristics and visual resources in the future with the Project.

B. EXISTING CONDITIONS

URBAN DESIGN

HEAD END SITE

The Head End Site includes three properties totaling approximately 3.6 acres. Two of the properties are on the eastern side of the Canal between Degraw and Butler Streets (Block 411, Lot 24 and Block 418, Lot 1) which are developed with several buildings that are currently in use by manufacturing and auto-related businesses, including automobile repair shops and electrical and plumbing contractors. Block 411, Lot 24 (234 Butler Street) currently contains a two-story brick building located at the intersection of Nevins and Butler Streets, with a one-story brick section along Butler Street, and an additional one-story brick structure along Nevins Street. There is an approximately 16-foot-wide gated opening between the two-story building and the one-story building along Nevins Street (see **Figures 8-2a through 8-2c, Photographs 1 to 5**). The building on the corner of Nevins Street and Butler Street is the former Gowanus Station, designed in the Beaux Arts Style and originally built in 1914. Block 418, Lot 1 (242-244 Nevins Street) contains a factory complex of four buildings built between 1905 and 1955. At the southwest corner of the lot, there is a one-story L-shaped brick warehouse with frontage on Nevins and Degraw Streets. The building includes four large metal roll-down doors and a smaller entrance with a metal door along the Nevins Street frontage, as well as window openings sealed and infilled with brick. Along the Degraw Street frontage, the building contains a storefront with an aluminum and glass door, transoms, and display windows (see **Figures 8-2c through 8-2e, Photographs 6 to 10**). Adjacent to the building along Degraw Street, the lot contains a one-story building clad in stucco that features three

8/9/2017

Project Sites

Gowanus Canal

Photograph View Direction and Reference Number

0 500 FEET

Project Location and Key to Photographs
Head End Site
Figure 8-1a

Gowanus Canal CSO Facilities

Project Sites

Gowanus Canal

1 Photograph View Direction and Reference Number

0 500 FEET

Project Location and Key to Photographs
Owls Head Site

Gowanus Canal CSO Facilities

Figure 8-1b

8.2.17

View of Head End Site looking southeast from Butler Street **1**

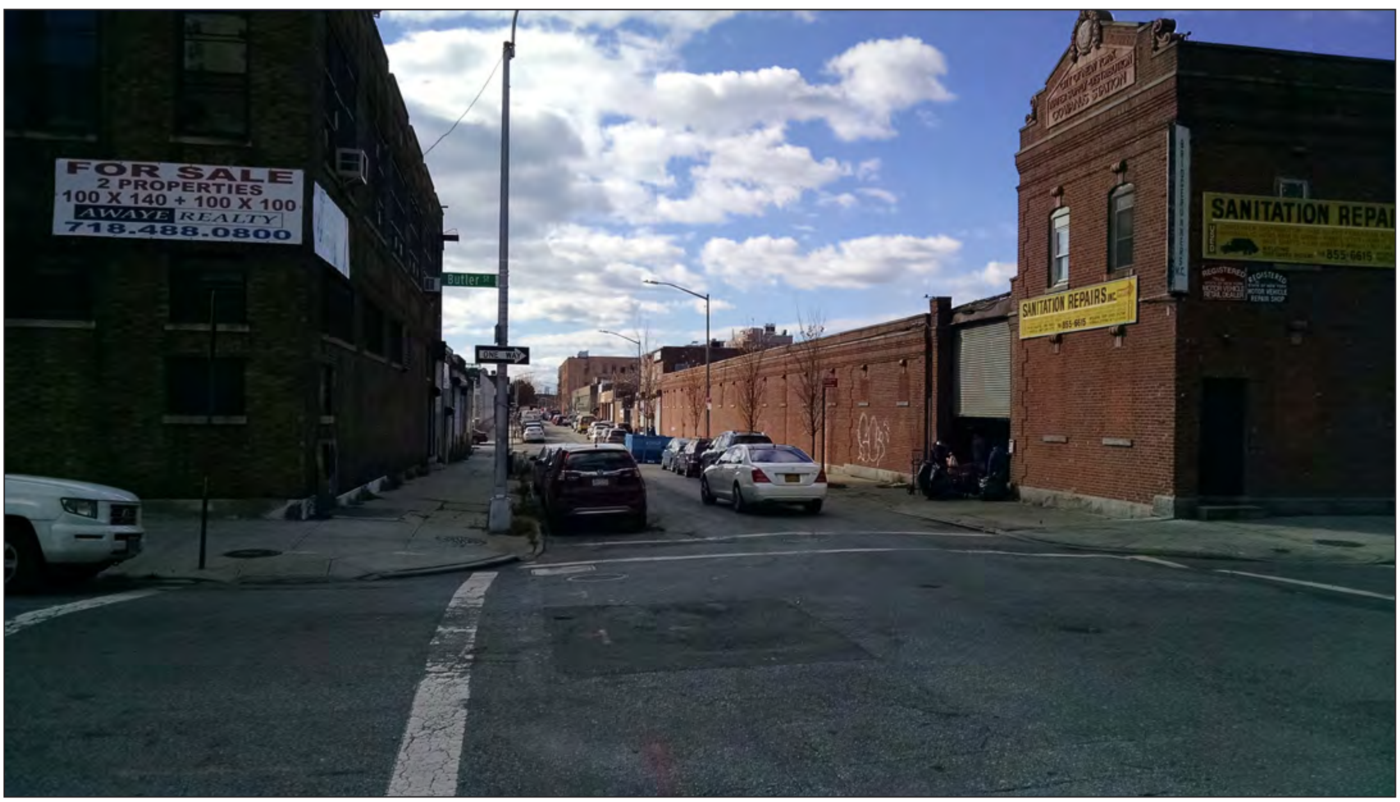
View of Head End Site looking southwest from the intersection of Nevins and Butler Streets **2**

Urban Design and Visual Resources-
Photographs

Figure 8-2a

8.2.17

View of Head End Site looking west along Butler Street **3**



View of Head End Site looking south along Nevins Street **4**

Urban Design and Visual Resources-
Photographs
Figure 8-2b

View of Head End Site looking southwest from Nevins Street **5**

View of Head End Site looking southwest from the intersection of Nevins and Douglass Streets **6**

Urban Design and Visual Resources-
Photographs

Figure 8-2c

8.2.17

View of Head End Site (entrance gate) looking west from Nevins Street **7**

View of Head End Site looking north along Nevins Street **8**

Urban Design and Visual Resources-
Photographs
Figure 8-2d

View of Head End Site looking northwest from the intersection of Nevins and Degraw Streets **9**

View of Head End Site looking west along Degraw Street **10**

Urban Design and Visual Resources-
Photographs
Figure 8-2e

8.2.17

View of Head End Site looking north from Degraw Street **11**

View of Head End Site looking southwest from the intersection of Nevins and Degraw Streets **12**

Urban Design and Visual Resources-
Photographs
Figure 8-2f

View of Head End Site looking west along Sackett Street **13**

View of Head End Site looking north from the intersection of Nevins and Sackett Streets **14**

View of Head End Site and the Gowanus Canal looking northeast from Douglass Street dead-end, west side of the Canal **15**

View of Head End Site and the Gowanus Canal looking southeast from Douglass Street dead-end, west side of the Canal **16**

8.2.17

View of Head End Site and the Gowanus Canal looking southeast from Degraw Street dead-end, west side of the Canal **17**

View of Owls Head Site looking northwest from the intersection of 2nd Avenue and 6th Street **18**

Urban Design and Visual Resources-
Photographs
Figure 8-2i

8.2.17

View of Owls Head Site looking southwest from 2nd Avenue **19**

View of Owls Head Site looking west along 5th Street **20**

Urban Design and Visual Resources-
Photographs

View of Owls Head Site looking northwest from the intersection of 2nd Avenue and 5th Street **21**

View of Owls Head Site (DSNY property) looking east from 2nd Avenue **22**

View of Owls Head Site looking east along 5th Street **23**

View of Owls Head Site looking west along 5th Street **24**

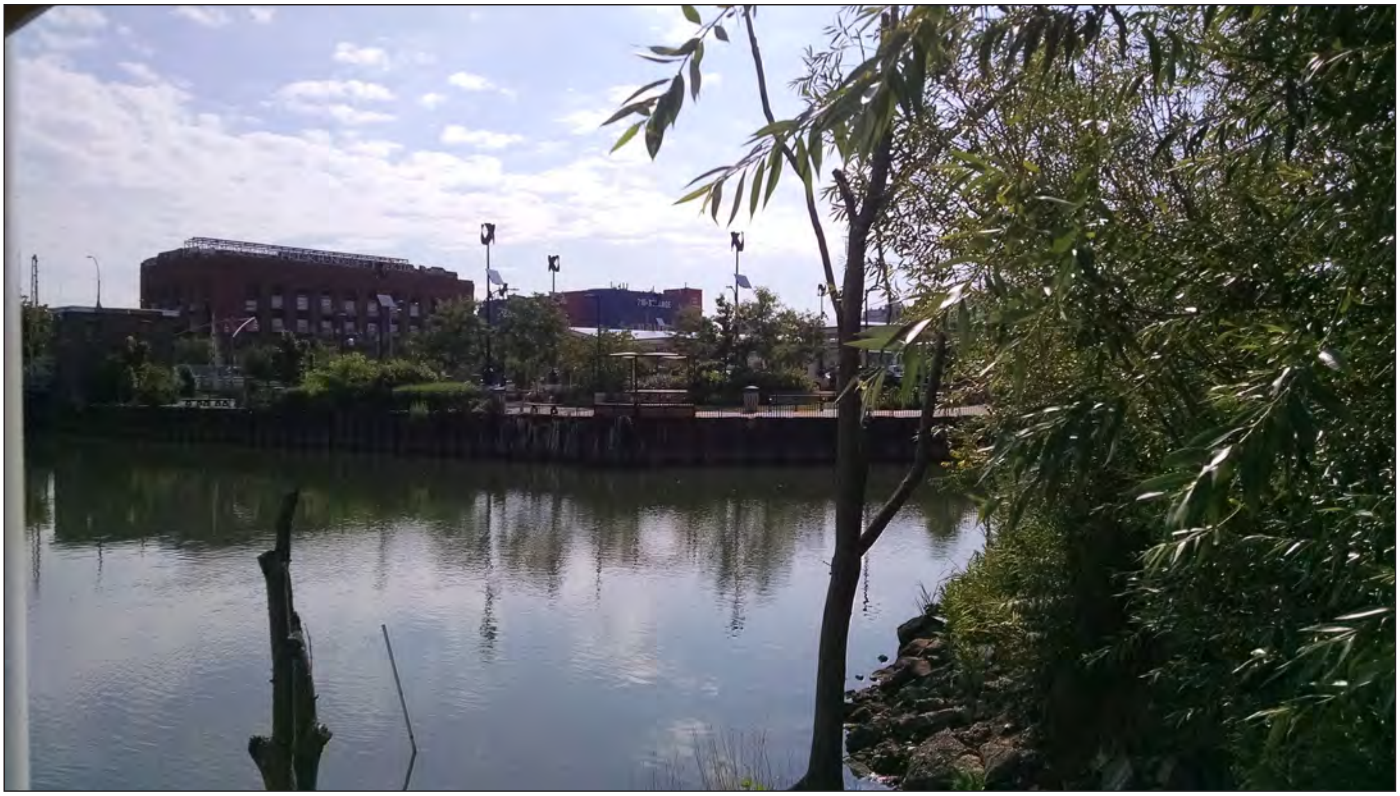
Urban Design and Visual Resources-
Photographs
Figure 8-2l

View of Owls Head Site (DSNY property) looking northeast from 5th Street **25**

View of Owls Head Site and the Gowanus Canal looking south from Bond Street dead-end **26**

Urban Design and Visual Resources-
Photographs

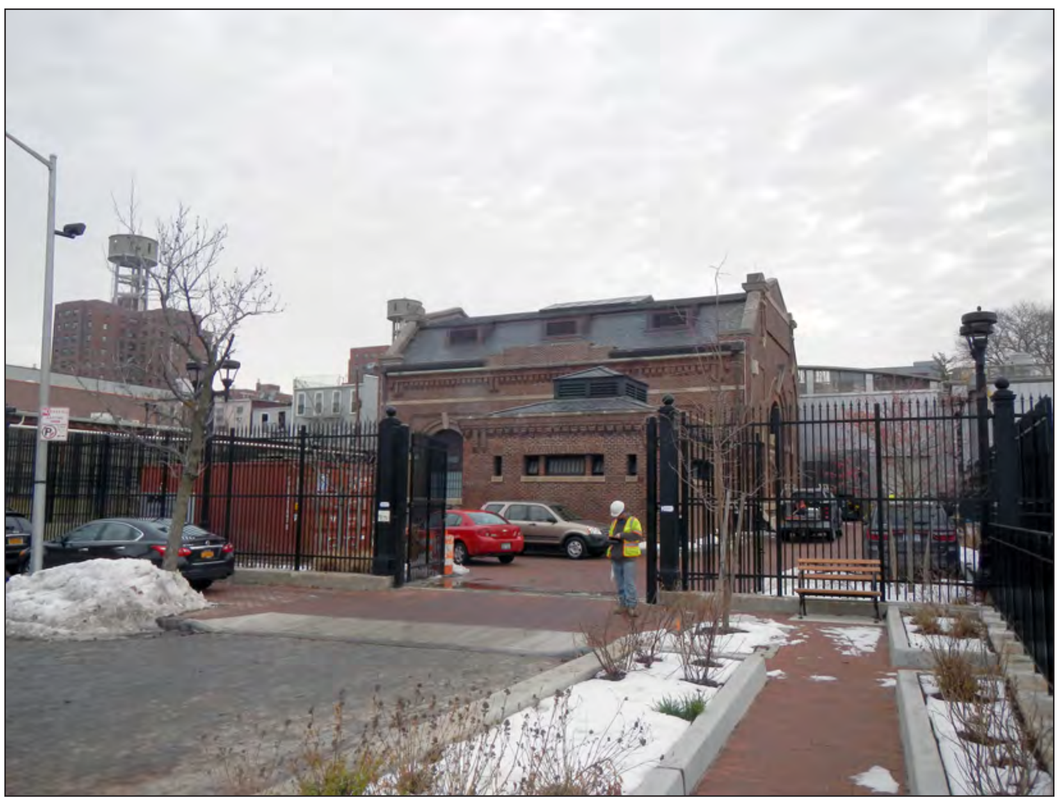
Figure 8-2m



View of the Gowanus Canal looking north from 2nd Avenue dead-end **27**

View of ASPCA Memorial Building looking north from Butler Street **28**

View of Thomas Greene Playground looking southwest from the intersection of 3rd Avenue and Douglass Street **29**



View of Pumping Station looking north from Douglass Street **30**

Urban Design and Visual Resources-
Photographs

Figure 8-2o

narrow bays and two garage openings with metal roll-down doors (see **Figure 8-2f, Photograph 11**). Degraw Street runs along the southern side of the lot, dead-ending at the Canal.

The third property on the Head End Site (Block 425, Lot 1; 270 Nevins Street) contains a one-story brick warehouse building currently in use as a film production studio that occupies the entire block on the west side of Nevins Street between Sackett and Degraw Streets. Multi-light windows cover the majority of the mid-section of the building and have metal security guards covering them. The three street-facing façades have entryways that have metal roll-down doors (see **Figures 8-2f and 8-2g, Photographs 12 to 14**); the west façade fronts the Gowanus Canal and is a low concrete structure with small window openings and a metal roll-down door. Sackett Street is closed and unbuilt between Nevins Street and the Canal.

As discussed in Chapter 7, "Historic and Cultural Resources," all of the buildings on the Head End Site (excluding a one-story building on the interior of Block 411, Lot 24 that was constructed ca. 1990) have been determined by the New York State Historic Preservation Office (SHPO) to be architectural resources that contribute to the significance of the State and National Register (S/NR)-eligible Gowanus Canal Historic District.

OWLS HEAD SITE

The Owls Head Site includes five properties totaling approximately 4.1 acres. Block 977, Lot 3 (2 2nd Avenue), located along the southern side of the Canal as it bends toward the west near the 4th Street turning basin, is owned by the New York City Department of Sanitation (DSNY) and includes a road salt storage yard and space for storage of snow plows; a recently constructed salt shed is on the property. The property is also used periodically by a local non-profit environmental group, the Gowanus Canal Conservancy (GCC), for environmental education and stewardship events, including composting operations. Block 977, Lot 1, located to the south of the DSNY property, is an improved privately owned streetbed (a portion of 5th Street) that ends at a truck storage yard on the property along the Canal (Block 990, Lot 21). The remaining two properties on the Owls Head Site along the southern side of 5th Street—Block 990, Lots 1 and 16 (22-36 2nd Avenue, 114-132 5th Street, and 110 5th Street) contain one-story concrete block and brick industrial buildings with metal roll-down doors that are used by automobile repair and shipping businesses (see **Figures 8-2h through 8-2m, Photographs 18 to 25**).

STUDY AREA

Urban Design

As discussed in Chapter 2, "Land Use, Zoning, and Public Policy," the areas within 600 feet of the Head End Site and the Owls Head Site are low-density areas. While the area near the Owls Head Site is more industrial in character (primarily 1- to 3-story manufacturing, distribution, and warehouse buildings), particularly in the area immediately adjacent to the Owls Head Site on the eastern side of the Canal, the area near the Head End Site contains a wider variety of building types, including residential townhouses and walkup apartment buildings, a four-story former warehouse building (282 Nevins Street) that has been converted to a multi-family apartment building and artists' lofts, and two multi-story (21 floors) residential complexes (Wyckoff Gardens and the Gowanus Houses) operated by the New York City Housing Authority (NYCHA). In addition, the Thomas Greene Playground, a public open space (which includes a public pool) operated by the New York City Department of Parks and Recreation (NYC Parks) is located east of the Head End Site between Douglass and Degraw Streets. The Head End Study Area also contains a 6-story hotel along Butler Street to the east of the Head End Site, and a currently vacant former manufacturing building immediately north of the Head End Site (239 Butler Street) is proposed to undergo renovations to convert it into a hotel. Portions of the study area are within the S/NR-eligible Gowanus Canal Historic District, which includes several architecturally distinguished buildings, including the Pumping Station between Butler and Douglass Streets and the ASPCA Memorial Building, located along Butler Street near the Head End Site (see Chapter 7, Historic and Cultural Resources").

Visual Resources

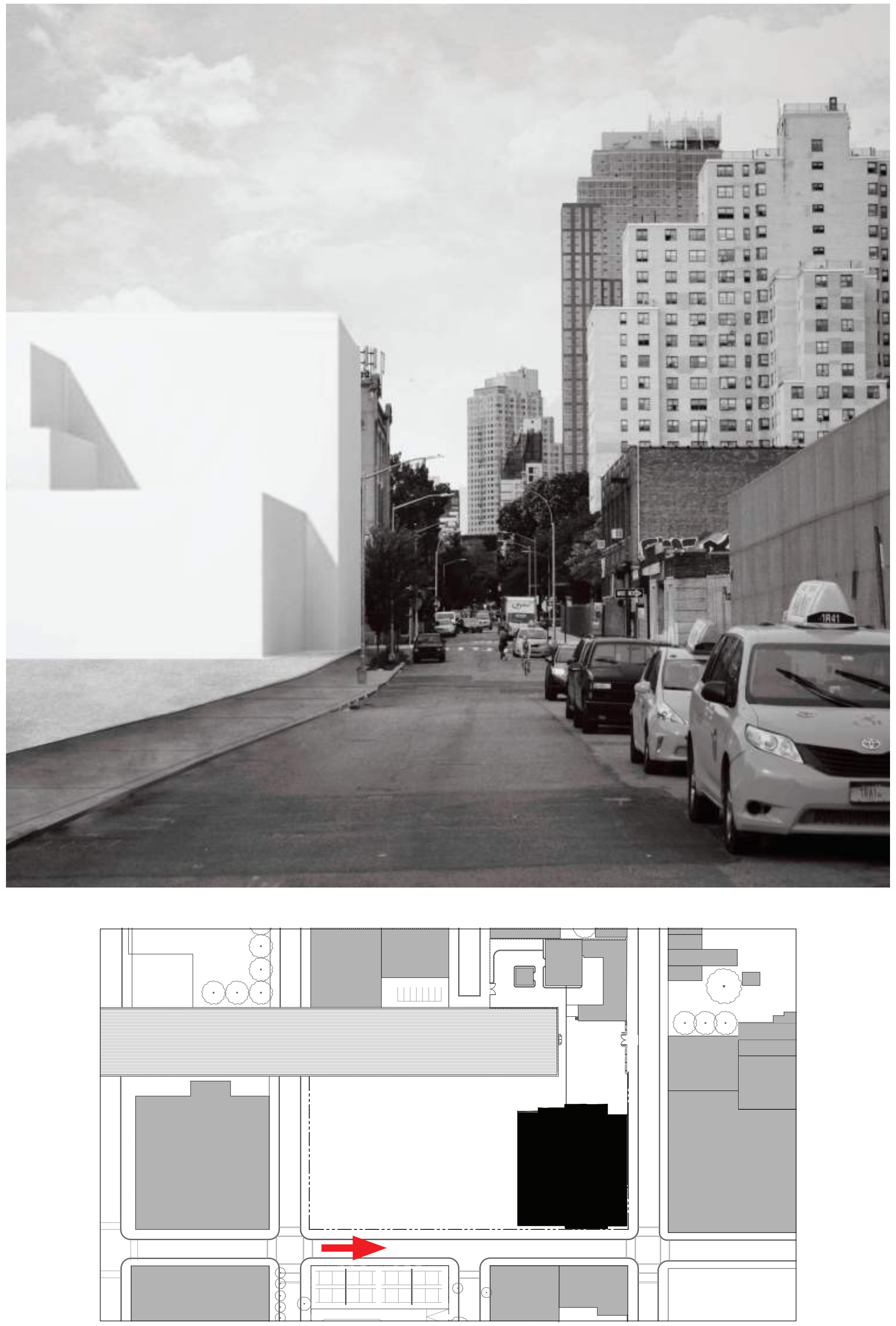
Visual resources in the study areas for the Head End Site and the Owls Head Site are generally limited to the Canal itself, the architecturally significant Pumping Station and ASPCA Memorial Building, and the east portion of Thomas Greene Playground. An additional visual resource, the St. Agnes Roman Catholic Church, is located along Hoyt Street to the west of the Canal outside of the Head End Study Area, but is visible from the dead-end of Degraw Street at the Canal. Views of the Canal are limited from the east side of the Canal (in the areas near the project sites) due to the intervening buildings and structures on the Head End Site and the Owls Head Site. Views of the Canal are available from the dead-ends of several streets (including 2nd Avenue near the Owls Head Site), although some of these views are interrupted by fencing; the most open views of the Canal are from the western side of the Canal at the dead-ends of Douglass and Degraw Streets, opposite the Head End Site (see **Figures 8-2h, 8-2i, 8-2m and 8-2n, Photographs 15 to 17 and 26 to 27**). As noted above, the Pumping Station is located between Butler and Douglass Streets and is across the Canal from the Head End Site; this is a one-story double-height brick building designed in the Romanesque Revival-style and built ca. 1905-1911. The ASPCA Memorial Building is located on Butler Street near the Head End Site; this is a two-story Romanesque Revival-style brick building with Flemish bond brick façades and Romanesque detailing (see **Figure 8-2n, Photograph 28**).

As noted above, the Thomas Greene Playground is located near the Head End Site. While the western portion of the park along Nevins Street features paved areas and concrete structures, including handball courts, a public pool (the Douglass and Degraw pool) with a comfort station and changing rooms, and basketball courts, the eastern end of the Park contains a playground and seating area with large, mature trees that is a visual amenity in the study area (see **Figure 8-2o, Photograph 29**).

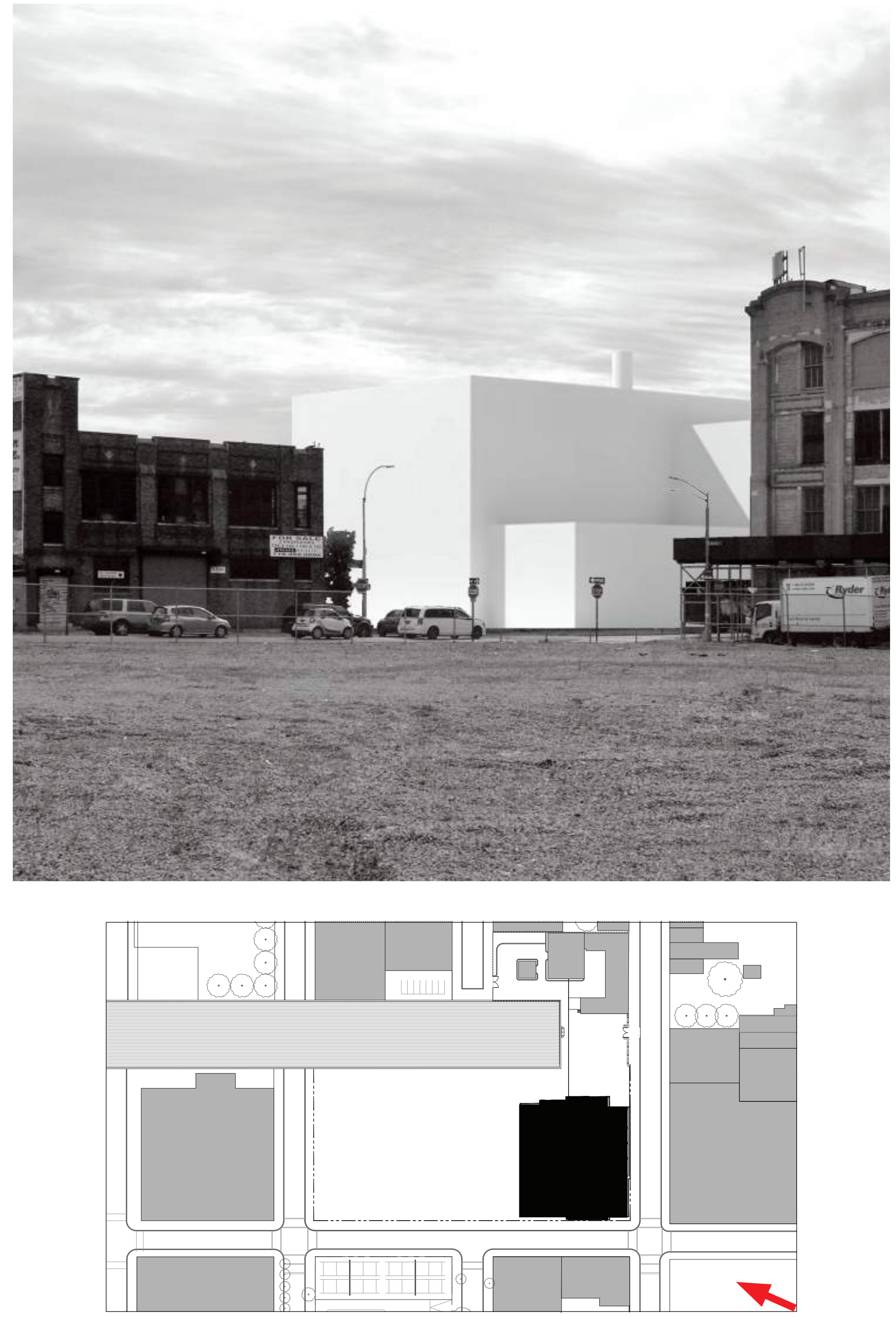
C. SCREENING ASSESSMENT

The Project would result in the construction of two Combined Sewer Overflow (CSO) facilities at the Head End Site and the Owls Head Site. As described above, both sites are currently largely developed with 1- and 2-story manufacturing and warehouse buildings (the Owls Head Site also contains a New York City Department of Sanitation (DSNY) salt storage facility and community-sponsored composting program and an open privately owned street). As detailed in Chapter 1, "Project Description," the Head End Facility would include a below-grade structure containing a tank and associated infrastructure, and an above-grade 25,700-sf, two-story structure (approximately 50 feet tall) that would be located at the northern end of the site (see **Figure 8-3**). The remainder of the surface area of the Head End Site is expected to be paved and accessible for maintenance and operations with landscaping where appropriate. The design would include a 50-foot setback from the bulkhead, and would provide some form of waterfront public access to the Gowanus Canal. Construction of the Head End Facility would also include construction of a new sewer on Nevins Street from the intersection with Sackett Street to the intersection with Butler Street.

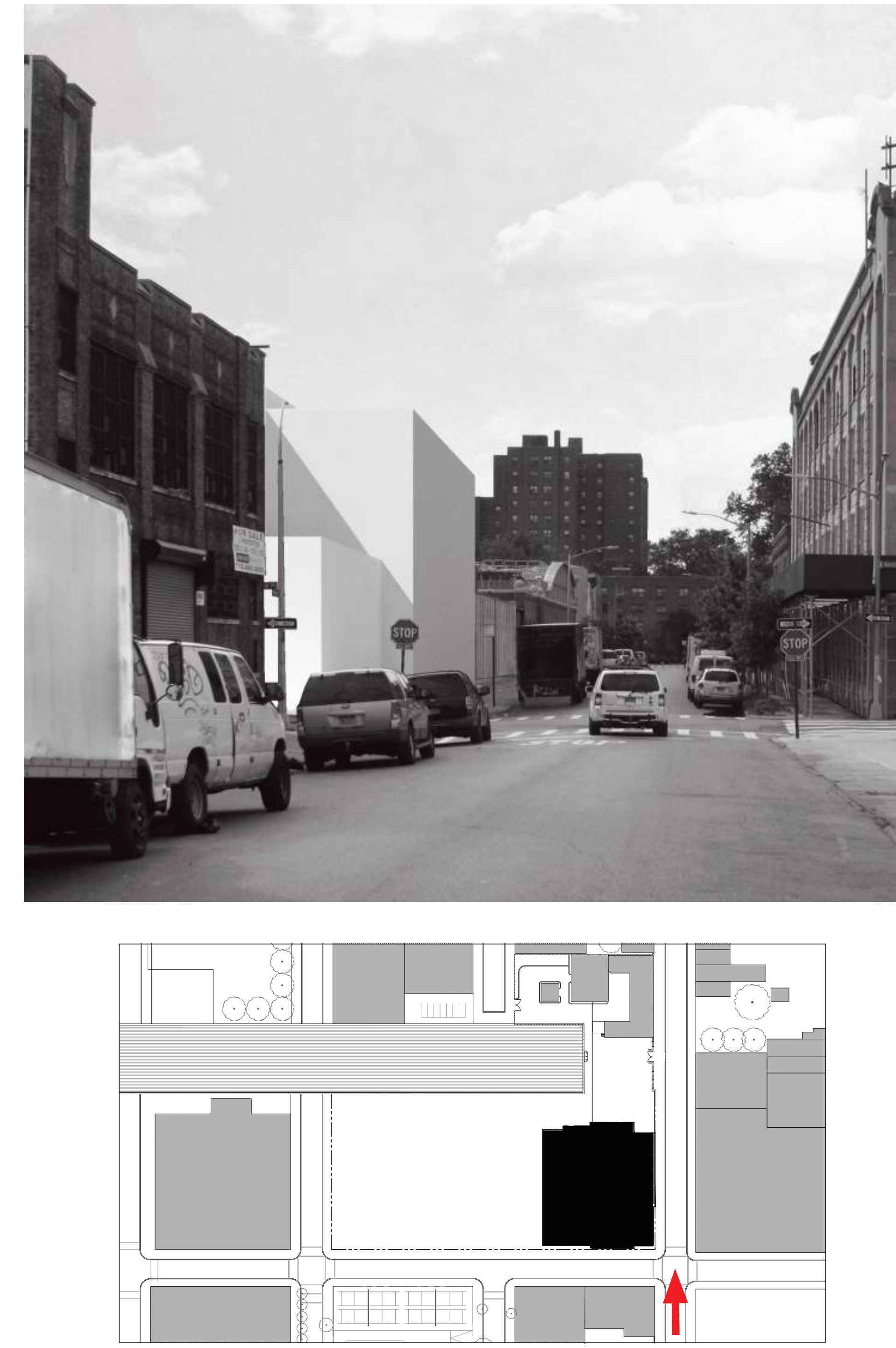
The Owls Head Facility would include a below-grade structure containing a tank and associated infrastructure and an approximately 17,600-sf, two-story above grade structure (approximately 50 feet tall). Construction of the Owls Head Facility would also include replacement of the existing bulkhead and a new force main to connect the Owls Head Facility to the Owls Head Interceptor. A portion of the site contains a DSNY facility that would be incorporated on the Owls Head Site, with the remainder of the site expected to be paved and accessible for maintenance and operations with landscaping elements where



LOOKING NORTHEAST ALONG NEVINS ST



LOOKING WEST FROM BALTIC ST



LOOKING NORTHWEST ALONG BUTLER ST

Proposed Above-Ground Structure of the Head End Facility

Figure 8-3

appropriate. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility.

Both project sites are located within a manufacturing zoning district (M2-1). The Facilities would meet all applicable zoning requirements and would not require any modifications to the zoning regulations related to yards, height and setbacks, or bulk. Further, the CSO Facilities are Use Group 18 manufacturing uses[1] and would not exceed the maximum bulk permitted for manufacturing uses in the M2-1 district—i.e., a maximum floor area ratio (FAR) of 2.0. Similarly, the buildings which would house certain operations of the CSO Facilities would be approximately 50 feet tall—below the permitted maximum streetwall height of 60 feet in an M2-1 district. Therefore, the buildings would comply with height and setback regulations permitted in this zoning district and would also be consistent with the urban design of the study area (as shown on **Figure 8-3**). While the Project would result in physical changes to the Head End Site and the Owls Head Site and would introduce new buildings, these changes would not be beyond what is currently allowed by existing zoning.

Given that the CSO Facilities would be a complying manufacturing use under Use Group 18, Waterfront Zoning regulations related to public open space and visual corridors (as defined by Article VI, Chapter 2 of the Zoning resolution) are not applicable to the Project. However, the Facilities are being designed to enhance the character of the project sites and surrounding area, and to provide views to and through the project sites to the extent practicable. It is anticipated that the Head End Site would include publicly accessible areas at street level, possibly with landscaping elements atop the below-grade tank area. It is also anticipated that the Head End Site would include a 50-foot setback from the bulkhead and would provide some form of waterfront public access along the Canal. Should these publicly accessible Project elements be developed at the Head End Site, they would further enhance the pedestrian experience of the study area.

As noted above, there are limited views of the Canal in the areas near the Project Sites due to the intervening buildings and structures on the Head End Site and the Owls Head Site. The proposed publicly accessible areas on the Head End Site would create new views of the Canal from nearby areas by removing existing structures and facilities, thereby improving westward views from the adjacent Thomas Greene Playground. Similarly, additional eastward views towards Thomas Greene Playground from Douglass Street and Degraw Street would also be possible. These changes would enhance the pedestrian experience as compared with the manufacturing and automotive-related facilities on these parcels that would remain in the future without the Project, and which limit visual and physical access to the Canal. Therefore, the changes at the Head End Site would be expected to enhance views of the waterfront from vantage points near the Head End Site. The Head End Facility would also not affect views of the other visual resources in the area (the Pumping Station, ASPCA Memorial Building and the eastern end of the Thomas Greene Playground), which are located away from the Head End Site and would remain visible from the surrounding streets.

The Owls Head Facility would change the urban design character of the site by introducing a new two-story above grade structure and new paving and landscaping. These changes to the Owls Head Site would be consistent with M2-1 zoning regulations. At the Owls Head Site, the DSNY salt storage facility would

[1] Under the Zoning Resolution (ZR), Use Group 18 consists of industrial uses such as storage or miscellaneous uses, open or enclosed; coal or gas storage; dumps, marine transfer stations for garbage or slag piles; and sewage disposal plants. The uses listed in Use Group 18 are permitted in a M2-1 district if such uses comply with all of the applicable performance standards for the district (ZR 42-00). As the CSO facilities would meet or exceed the applicable performance standards for the M2-1 zoning district, it is a permitted use under zoning.

be accommodated along with the Owls Head Facility, and would be accessible to the public following completion of construction; the site could also be accessible for GCC activities following completion of construction. DEP is also evaluating the potential for the site to include accessible waterfront open space where it does not interfere or conflict with the operation of the Owls Head Facility. Further, the anticipated landscaping elements would be an aesthetic improvement over existing conditions. Therefore, the Owls Head Site would enhance the urban design character of the project site.

Overall, the Project would comply with applicable zoning regulations regarding bulk and built form, and would result in physical and visual changes consistent with zoning regulations along the Canal. The pedestrian experience in certain areas along the Canal close to the Head End Facility and the Owls Head Facility would be enhanced with the new project components, including publicly accessible elements at the Head End Site and landscaping elements at the Owls Head Site. Therefore, the Project is not anticipated to result in any significant adverse impacts to urban design and visual resources or the pedestrian's experience of these characteristics of the built and natural environment and no further analysis is warranted. ✷

Chapter 9: Natural Resources

A. INTRODUCTION

This chapter examines the potential impacts from the Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) on natural resources in Brooklyn, Kings County, New York. Natural resources are defined as plants, wildlife, and other organisms; aquatic or terrestrial areas capable of providing suitable habitat; and areas capable of functioning in support of ecological systems. The chapter describes:

- The regulatory programs that protect wetlands, groundwater, floodplains, aquatic resources, wildlife, threatened or endangered species and species of special concern, and other natural resources within the study area;
- The current condition of natural resources within the study area, including wetlands, groundwater, floodplains, aquatic resources, wildlife, and threatened or endangered species and species of special concern;
- The natural resources conditions under the Future Conditions in the Analysis Year;
- The potential impacts of the Project on natural resources; and
- The measures that would be developed, as necessary, to mitigate and/or reduce any of the Project's potential significant adverse effects on natural resources.

B. METHODOLOGY

REGULATORY CONTEXT

FEDERAL

Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §§ 9601 – 9675)

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as CERCLA or Superfund, provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through CERCLA, the United States Environmental Protection Agency (USEPA) was given power to seek out those parties responsible for any release and ensure their cooperation in the clean-up.

CERCLA response actions (e.g., removal or remedial action) are exempted by law (CERCLA *§ 121[e])* from the requirement to obtain federal, state or local permits related to any activities conducted completely on-site. Instead, these response actions are subject to a permit "equivalency" process, under which the lead agency must complete the same process as obtaining a permit but waiving most fees, public hearings and other procedural requirements. Under the Project, DEP would complete all required permit application materials, seeking work authorization from USEPA.

Clean Water Act (33 USC §§ 1251 - 1387)

The objective of the Clean Water Act, also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. It regulates point sources of water pollution, such as discharges of municipal sewage, industrial wastewater, and stormwater runoff; the discharge of dredged or fill material into navigable waters and other waters; and non-point source pollution (e.g., runoff from streets, construction sites, etc.) that enters water bodies from sources other than the end of a pipe.

Section 404 of the Act requires authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), for the discharge of dredged or fill material into waters of the United States. Activities authorized under Section 404 must comply with Section 401 of the Act.

Under Section 401 of the Act, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must demonstrate to the federal agency issuing a certificate (either from the state where the discharge would occur or from an interstate water pollution control agency) that the discharge would comply with applicable requirements in the Act that deal with effluent standards and limitations. Applicants for discharges to navigable waters in New York must obtain a Section 401 Water Quality Certificate from the New York State Department of Environmental Conservation (NYSDEC).

Any fill required for the construction of the new outfall OH-007 and in-water components of outfall RH-038 would require approval or equivalency under this regulation.

Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through USACE, for the construction of any structure in or over any navigable waterway of the United States, the excavation from or deposition of material in these waters, or any obstruction or alteration in navigable waters of the United States. The purpose of this Act is to protect navigation and navigable channels. Any structures placed in or over navigable waters, such as pilings, piers, or bridge abutments up to the mean high water line, are regulated pursuant to this Act. The construction of new outfall OH-007 and any in-water components of outfall RH-038 require authorization or equivalency under this Act.

Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801 TO 1883).

Section 305(b)(2)-(4) of the Magnuson-Stevens Fishery Conservation and Management Act outlines the process for the National Marine Fisheries Service (NMFS) and the Regional Fishery Management Councils (in this case, the Mid-Atlantic Fishery Management Council) to comment on activities proposed by federal agencies (issuing permits or funding projects) that may adversely impact areas designated as Essential Fish Habitat (EFH). EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802(10)). Adverse impacts on EFH, as defined in 50 CFR 600.910(A), include any impact that reduces the quality and/or quantity of EFH. Adverse impacts may include: direct impacts, such as physical disruption or the release of contaminants; indirect impacts, such as the loss of prey or reduction in the fecundity (number of offspring produced) of a managed species; and site-specific or habitat-wide impacts that may include individual, cumulative, or synergetic consequences of a federal action. Portions of the Project Sites fall within waters designated as EFH; therefore, potential effects of the Project on EFH have been evaluated.

Migratory Bird Treaty Act (50 CFR 10, 20, 21, EO 13186)

The Migratory Bird Treaty Act (MBTA) of 1918 was implemented following the 1916 convention between the U.S. and Great Britain (on behalf of Canada) for the protection of birds migrating between the U.S. and Canada. Subsequent amendments implemented treaties between the U.S. and Mexico, Japan, and the former Soviet Union. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed therein. Over 800 species are currently protected under the Act. The statute applies equally to both live and dead birds, and grants full protection to any bird parts, including feathers, eggs, and nests. Species protected under the Act have the potential to occur in the study area.

Endangered Species Act of 1973 (16 USC §§ 1531 TO 1544)

The Endangered Species Act of 1973 recognizes that endangered species of wildlife and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people. The Act provides for the protection of critical habitats on which endangered or threatened species depend for survival. The Act also prohibits the importation, exportation, taking, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities. Species protected under the Act have the potential to occur in the study area.

STATE

Tidal Wetlands Act, Article 25, ECL, Implementing Regulations 6 NYCRR PART 661.

Tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis. In New York, tidal wetlands occur along the tidal waters of the Hudson River up to the salt line and along the saltwater shore, bays, inlets, canals, and estuaries of Long Island, New York City, and Westchester County. NYSDEC administers the tidal wetlands regulatory program and the mapping of the state's tidal wetlands. A permit is required for activities that would alter NYSDEC mapped wetlands or tidal wetland adjacent area. NYSDEC-regulated wetlands are mapped along the Canal's shoreline in the Project area.

Protection of Waters, Article 15, Title 5, ECL, Implementing Regulations 6 NYCRR PART 608

NYSDEC is responsible for administering the Protection of Waters Act and regulations to govern activities on surface waters (rivers, streams, lakes, and ponds). The Protection of Waters Permit Program regulates five different categories of activities: disturbance of stream beds or banks of a protected stream or other watercourse; construction, reconstruction, or repair of dams and other impoundment structures; construction, reconstruction, or expansion of docking and mooring facilities; excavation or placement of fill in navigable waters and their adjacent and contiguous wetlands; and Water Quality Certification for placing fill or other activities that result in a discharge to waters of the United States in accordance with Section 401 of the Clean Water Act. Authorization under this program is required for construction of the in-water components of the Project, along with construction activities that could result in discharge to the Canal.

State Pollutant Discharge Elimination System (SPDES) (ECL Article 3, Title 3; Article 15; Article 17, Titles 3, 5, 7, 8; Article 21; Article 70, Title 1; Article 71, Title 19; Implementing Regulations 6 NYCRR Articles 2, 3).

Title 8 of Article 17, ECL, Water Pollution Control, authorized the creation of SPDES to regulate discharges to New York State's waters pursuant to a delegation by USEPA to New York State of permitting authority pursuant to the Clean Water Act. Activities requiring a SPDES permit include point source discharges of wastewater into surface or groundwater of the state, constructing or operating a disposal system (sewage treatment plant), discharge of stormwater, and construction activities that disturb one or more acres. Construction activities and operation of the Project as it relates to new outfalls or structures would require SPDES permits. CSO outfalls are covered under their respective drainage area's Wastewater Treatment Plant (WWTP) SPDES permit. Significant modifications to existing outfalls (e.g., structural or operational modification that results in changes to the volume or composition of the discharge) would require modification to the existing WWTP SPDES permits that regulate their discharge.

Removal of Trees and Protected Plants (ECL, Section 9-1503).

Section 9-1503 of the ECL states that: "[n]o person shall, in any area designated by such list or lists, knowingly pick, pluck, sever, remove, damage by the application of herbicides or defoliants, or carry away without the consent of the owner thereof, any protected plant." The Project may require some tree or plant removal.

Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern (ECL, Sections 11-0535 [1]-[2], 11-0536[2], [4], Implementing Regulations 6 NYCRR PART 182)

The Endangered and Threatened Species of Fish and Wildlife, and Species of Special Concern Regulations prohibit the taking, import, transport, possession, or selling of any endangered or threatened species of fish or wildlife, or any hide, or other part of these species as listed in 6 NYCRR §182.6. Under these regulations, adverse modification of occupied habitat of endangered or threatened species is prohibited without authorization from NYSDEC. Species protected under these regulations have the potential to occur in the study area.

CITY

New York City Local Law 3 (NYCRR Chapter 5)

Local Law 3 of 2010 amended Section 18-107 of the Administrative Code of the City of New York and codifies the New York City Department of Parks and Recreation's (NYC Parks) ability to regulate the replacement of trees on or within jurisdiction of the NYC Parks, which includes all trees growing in the public right-of-way and on land mapped as City parkland. The law requires permits from the NYC Parks for the removal of trees within NYC Parks' jurisdiction and requires replacement of trees that are removed. The law protects against the unauthorized removal, destruction, irreparable damage, and/or injury to trees under the jurisdiction of the NYC Parks. The Project may require tree removal.

As described above, the Project is exempt from the requirement to obtain federal, state or local permits for work conducted on-site. Under the equivalency process, DEP will complete the appropriate applications and materials for review by the appropriate City entities and USEPA. USEPA may authorize the work without the formal procedural requirements for those approvals.

STUDY AREA AND ANALYSIS TECHNIQUES

The Project Sites comprise primarily New York City streets and built lots with the exception of the Gowanus Canal. They are located in a highly developed urban area with limited natural resources; thus, the study area for terrestrial natural resources, groundwater, wetlands, and floodplains included the Project Sites and immediately adjacent areas. The study area for aquatic resources includes the entire Gowanus Canal. Threatened, endangered, or special concern species and significant natural communities were evaluated for a distance of 0.5 miles from the Project Sites. This distance is used to provide an adequate buffer around sensitive species of concern.

Existing conditions for floodplains and natural resources within the Project Sites were summarized from:

- Existing information identified in the literature and obtained from governmental and nongovernmental sources, such as the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and Information, Planning and Consultation (IPaC) system for federally threatened and endangered species (http://ecos.fws.gov/ipac); New York City Department of Environmental Protection (DEP) Harbor Water Quality Survey reports and data; New York State Breeding Bird Atlas, 2000-2005; NYSDEC Herp Atlas Project 1990-1999; NYSDEC Environmental Resource Mapper (http://www.dec.ny.gov/gis/erm); NYSDEC Nature Explorer (http://www.dec.ny.gov/natureexplorer/app); and Federal Emergency Management Agency (FEMA) preliminary Flood Insurance Rate Maps (FIRMs).

- Observations made during the reconnaissance investigations conducted within the study area on February 23, 2017 and July 10, 2017.

FUTURE CONDITIONS IN THE ANALYSIS YEAR

The expected state of natural resources within the study area in the Future Conditions in the Analysis Year is evaluated under the assumption that by the analysis year (2028), land cover type and human activity would not differ from the present. Water quality and other aquatic resources in Upper New York Harbor are likely to continue gradually improving as a result of several ongoing local and regional initiatives, including remediation of the Canal and related upland sites under Superfund and other regulatory programs, but otherwise, floodplains and terrestrial resources in the study area are expected to remain essentially unchanged in the future without the proposed project.

PROBABLE IMPACTS OF THE PROJECT

Potential impacts in the Future with the Project were assessed by considering potential impacts during construction of the Project, such as temporary increases in suspended sediment during any in-water construction activities, and loss of bottom habitat as a result of any placement of in-water structures, discharge of groundwater recovered during dewatering activities, and discharge of sediment during construction. Potential impacts due to operation of the Project include discharge of runoff, disturbances to wildlife from increased human activity, and potential habitat improvements (e.g., improved terrestrial habitat from landscaping and improved water quality from the operation of the Head End and Owls Head Facilities).

C. EXISTING CONDITIONS

GROUNDWATER

The study area is located within the Brooklyn-Queens Aquifer System, which is composed of the Upper Glacial, Jameco, Lloyd, and Magothy aquifers, and is designated as a Sole Source Aquifer by USEPA. This aquifer system consists of deposits of unconsolidated gravel, sand, silt, and clay from the Holocene, Pleistocene, and Late Cretaceous age, and attains a total thickness of about 1,050 feet in New York City.

As discussed in Chapter 10, “Hazardous Materials,” groundwater is first encountered at approximately 4 to 14 feet below grade at the Head End Facility, and similar depths to groundwater are expected to occur within the Owls Head Facility. Groundwater within the study area is influenced by the tidal cycle and flows toward the Gowanus Canal based on the local topography. Groundwater in Brooklyn is not used as a source of potable water; the City’s drinking water is supplied by a surface supply system made up of 19 upstate reservoirs and three controlled lakes, which along with their major tributaries are protected under the NYC Watershed Program.

Water samples, from monitoring wells installed along the length of the Canal, were sampled by USEPA in 2010 as part of their remedial investigation (RI) report. Water samples from shallow groundwater wells (i.e., 15 feet in depth) were found to have concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals that exceeded screening values (i.e., state and federal standards) (USEPA 2011). Water samples from intermediate groundwater wells (i.e., 35 to 45 feet in depth) were found to have concentrations of VOCs, SVOCs, pesticides, and metals that exceeded state and federal screening values. The pH of shallow and intermediate well water samples ranged from 6.5 to 8.3 and 6.3 to 8.0, respectively. The dissolved oxygen (DO) content of water samples from both shallow and intermediate wells was less than 1.1 milligrams per liter (mg/L), and were considered anoxic.

FLOODPLAINS

New York City is affected by local or street flooding (e.g., inland flooding due to short-term, high-intensity rain events coupled with inadequate drainage), fluvial flooding (e.g., rivers and streams overflowing their banks), and coastal flooding (e.g., astronomical high tides and/or surges) that affect the City's Atlantic coast, bays such as Upper New York Bay, tidally influenced rivers such as the Hudson and East Rivers, streams, and inlets such as the Gowanus Canal [FEMA 2007]). As a tidally influenced water of the Upper New York Bay, the coastal flood hazard areas mapped within the study area are influenced by astronomical tides and meteorological forces (e.g., northeasters and hurricanes [FEMA 2007]), not by fluvial flooding (see **Figure 9-1**).

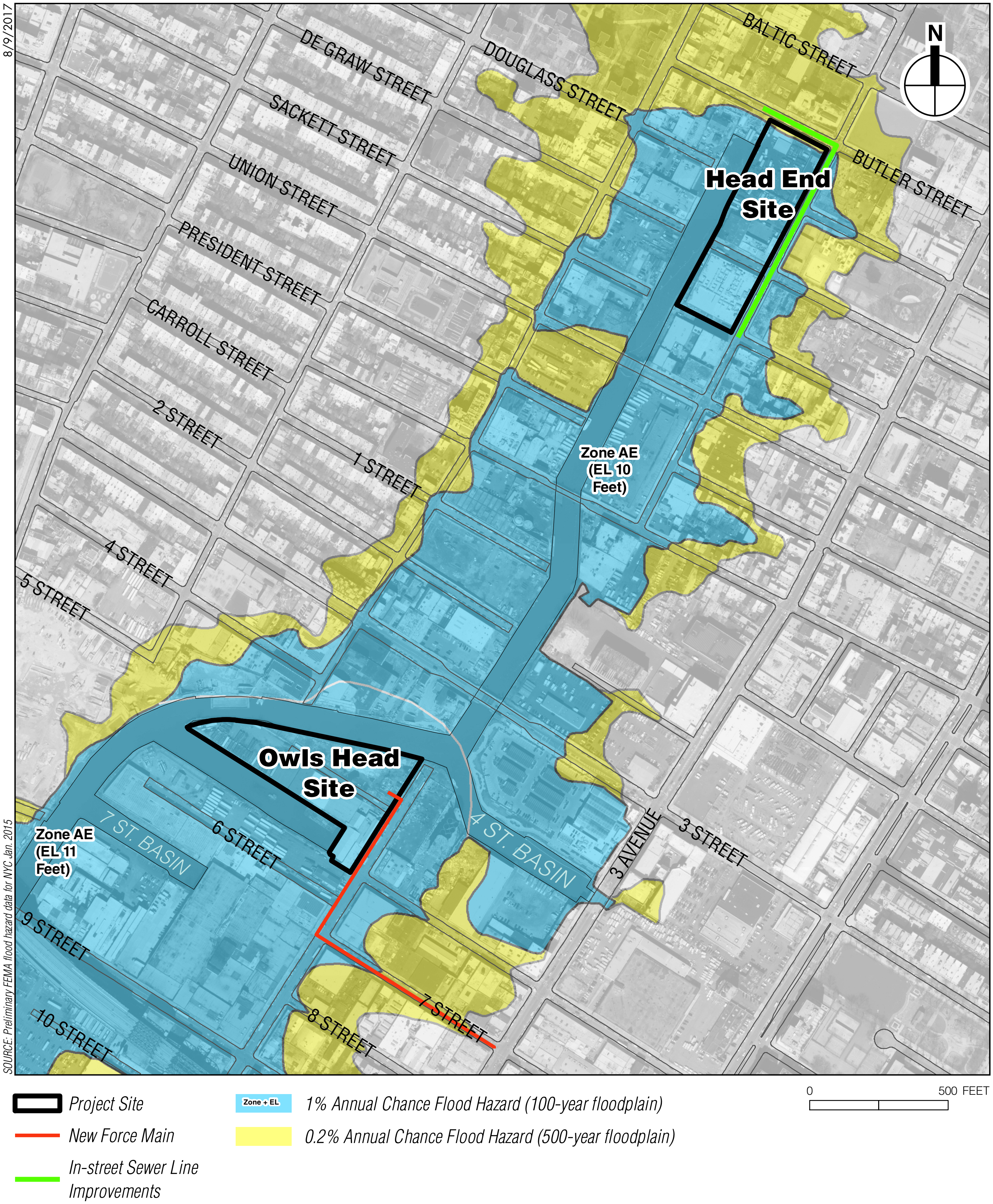
FEMA released preliminary FIRMs on January 30, 2015 in advance of the publication of new, duly adopted, final FIRMs in the future. The preliminary FIRMs represent the Best Available Flood Hazard Data at this time. FEMA encourages communities to use the preliminary FIRMs when making decisions about floodplain management until final maps are available. As indicated in **Figure 9-1**, both the Head End Site and Owls Head Site are within the 100-year floodplain (Zone AE; the area with a 1 percent probability of flooding each year). The base flood elevation for Zone AE is 10 feet North American Vertical Datum of 1988 (NAVD88) within the Head End Site and 11 feet NAVD88 within the Owls Head Site. The force main associated with the Owls Head Facility is located partly within the 100-year floodplain, and partly within the 500-year floodplain (the area with a 0.2 percent probability of flooding each year).

WETLANDS

The Gowanus Canal, including the area of the Canal in the vicinity of outfall RH-038 at the Head End Site, as well as outfall OH-007 at the northern corner of the Owls Head Site, and the shoreline at the Owls Head Site, is mapped by the USFWS as an estuarine subtidal wetland with an unconsolidated bottom (wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones [less than 6-7 centimeters] and a vegetative cover less than 30 percent) that is permanently flooded and has been excavated (E1UBLx) (see **Figure 9-2a**). These areas are also mapped by NYSDEC as littoral zone (LZ) tidal wetland (see **Figure 9-2b**). Littoral zone wetlands are any tidal wetlands under no more than 6 feet of water at mean low water (MLW) that are not included under another tidal wetland category. A small portion of the Canal, located between the Head End Site and Owls Head Site near Carroll Street, is mapped by NWI as a riverine unknown perennial wetland with an unconsolidated bottom that is permanently flooded (R5UBH) (see **Figure 9-2c**). This wetland is not within the study area.

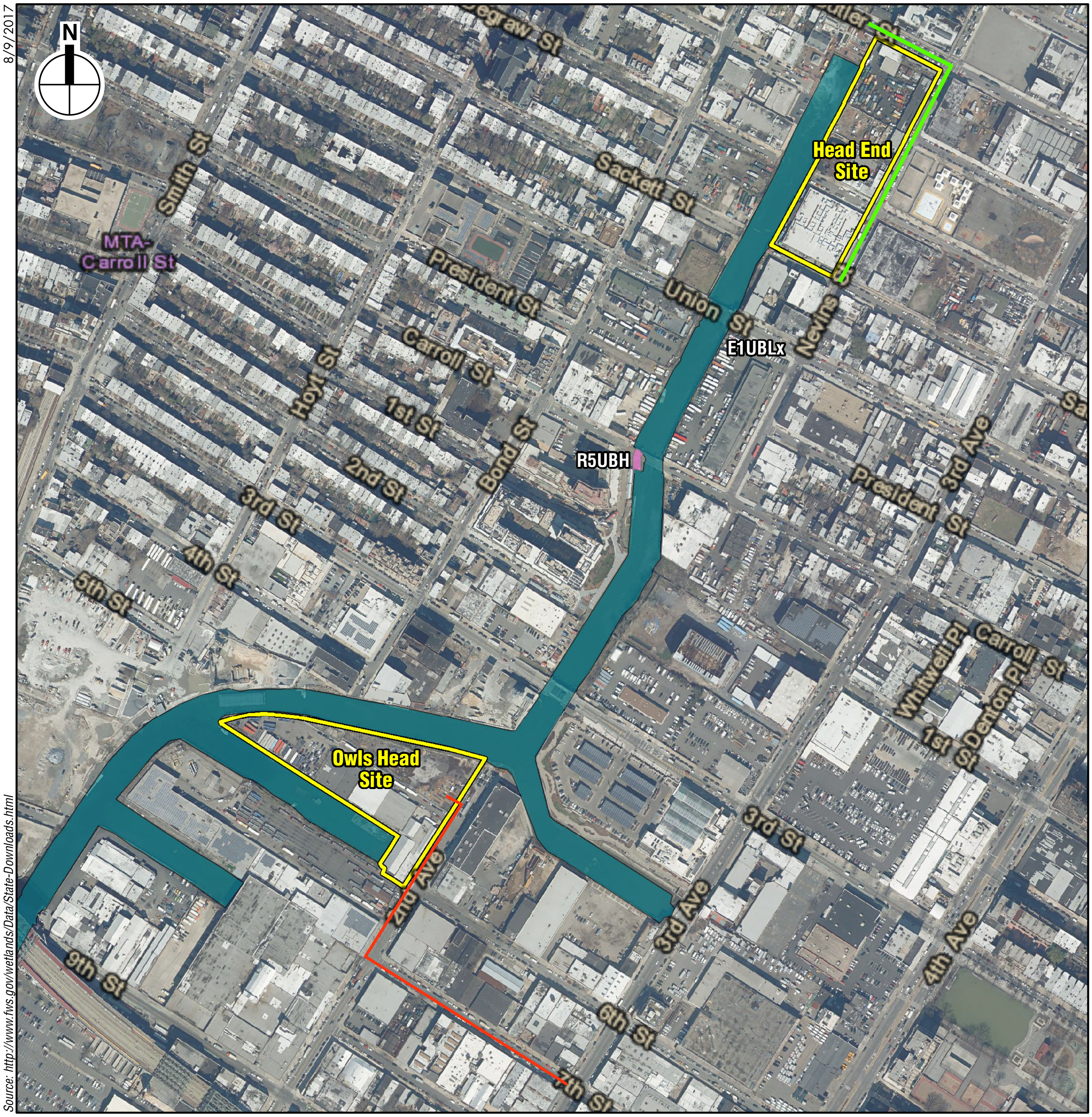
These NWI- and NYSDEC-mapped wetlands (with the exception of two small areas near the Owls Head Facility that are vegetated with saltmarsh cordgrass [*Spartina alterniflora*]) do not meet the definition of wetlands under the Clean Water Act due to the lack of hydrophytic vegetation, however, these areas are regulated as Waters of the United States by USACE. There are no NYSDEC-mapped freshwater wetlands within the Project Sites. In addition, portions of the Owls Head Site are within the NYSDEC-regulated tidal wetland adjacent area, due to the deteriorating condition of the bulkhead along the Site's northern boundary[1]. The NYSDEC-regulated tidal wetland adjacent area occupies the area between the NYSDEC-

[1] CEQR Reference Number 14DOS010K, City of New York Department of Sanitation, Improvements to DSNY's existing BK6 salt storage site, 2 Second Avenue, Brooklyn, July 31, 2014.



FEMA Preliminary
Flood Hazard Areas
Figure 9-1

8/9/2017



Source: http://www.fws.gov/wetlands/Data/State-Downloads.html

Project Sites

New Force Main

In-street Sewer Line Improvements

0 750 FEET

Wetland Type (Map Codes)

Riverine (R)

Estuarine and Marine Deepwater (E1, M1)

U.S. Fish and Wildlife Service
National Wetlands Inventory

Gowanus Canal CSO Facilities

Figure 9-2a

Project Sites

New Force Main

In-street Sewer Line Improvements

Tidal Wetlands

Littoral Zone

0 650 FEET

NYSDEC Tidal Wetlands

Gowanus Canal CSO Facilities

Figure 9-2b

Assumed NYSDEC Tidal Wetland Impact Area
Figure 9-2c

mapped tidal wetland boundary (mean high water [MHW]) and 150 feet inland of that boundary up to an elevation of 10 feet above MHW or a road/structure more than 100 feet in length that was present prior to August 20, 1977.

AQUATIC RESOURCES

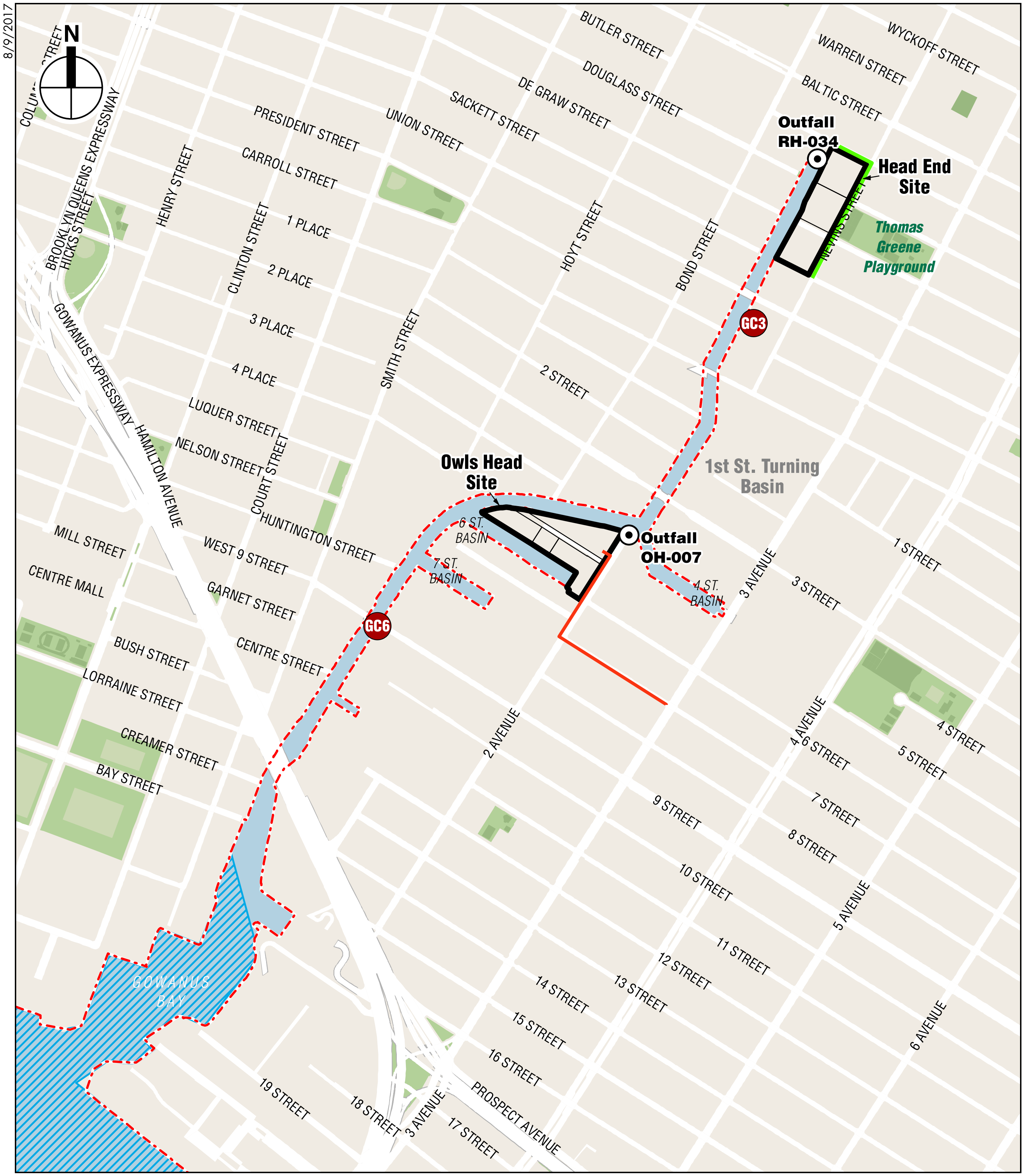
The Gowanus Canal is an approximately 1.8-mile-long tidally influenced, man-made channel located in Brooklyn, New York. It discharges to Gowanus Bay, which is within the Upper New York Bay portion of the New York-New Jersey Harbor Estuary (see Figure 1-1). The Canal was built in the 1860s on a site previously occupied by Gowanus Creek, local tributaries, and lowland marshes. It is connected to the Buttermilk Channel within Upper New York Bay at the confluence with the East River through the Gowanus Canal Flushing Tunnel. The Gowanus Canal Flushing tunnel pumps water from Buttermilk Channel to the Canal in order to flush poorly oxygenated water from the Canal. The shoreline of the Gowanus Canal is bulkheaded or protected with rip-rap throughout most of its length, and the only freshwater inflow to the Canal is from wet-weather CSO and stormwater discharges (AECOM 2015). Due to its narrow width, limited freshwater input, and enclosed upper end, current velocities within the Canal are low and tidal exchange with Gowanus Bay is limited. The USACE has not dredged the navigational channel from Gowanus Bay to the Hamilton Avenue Bridge since the 1970s (AECOM 2015). Water depths in this region of the Bay and at the mouth of the Canal currently range from 20 to 30 feet at mean lower low water (MLLW) (NOAA Nautical Chart #12334). North of the Hamilton Avenue bridge, the Canal has a maximum water depth of about 15 feet, and bottom sediments near the head of the Canal and at the heads of the turning basins are exposed at low tide. A 2010 bathymetry survey indicated the widespread presence of debris such as tires, sunken barges, concrete rubble, timbers, gravel, and general trash throughout the Canal (USEPA 2011).

WATER QUALITY

Water quality in the Gowanus Canal has historically been influenced by waste produced by manufactured gas plants (MGP), paper mills, tanneries, chemical plants, and other industries that operated along its banks beginning in the mid-1800s when the Canal was built. As required by USEPA and NYSDEC, National Grid is conducting remediation activities associated with contamination from these facilities. Water quality in the Gowanus Canal is currently influenced by the addition of water from Buttermilk Channel through the Flushing Tunnel and by CSO and stormwater discharges (AECOM 2015) similar to other waters in New York City. The majority of the Canal is classified by NYSDEC under 6 NYCRR Part 703 as Use Classification SD, which generally applies to waters with natural or man-made conditions that limit attainment of higher standards. Approximately from the Hamilton Bridge to its confluence with Gowanus Bay, the Canal is classified by NYSDEC as Use Classification I (see **Figure 9-3**). Under 6 NYCRR 701, the best use for Class SD waters is fishing, and the best uses for Class I waters are secondary contact recreation and fishing. NYSDEC has listed Gowanus Canal as impaired for floatables; the sources for this impairment include CSO discharge and urban/stormwater runoff (NYSDEC 2014).[2]

DEP monitors water quality in New York Harbor, including the Gowanus Canal, through its annual Harbor Survey. The results of recent surveys (DEP 2010, 2012) show that water quality throughout the Harbor has improved significantly due to measures undertaken by the City and other entities within the region. These measures include infrastructure improvements, elimination of 99 percent of raw dry-weather sewage

[2] The Gowanus Canal is not included on NYSDEC's 2016 draft 303(d) list because it does not currently require development of a total maximum daily load (TMDL). The Canal has not been delisted.



Project Sites

Gowanus Canal

In-street Sewer Line Improvements

New Force Main

NYCDEP Harbor Survey Station

Outfall Locations

Class I Water Quality Classification

Class SD Water Quality Classification

0 1,000 FEET

Gowanus Canal CSO Facilities

DEP Harbor Survey Stations

Figure 9-3

discharges, reduction of illegal discharges, increased capture of wet-weather-related floatables, and reduction of toxic metal loadings from industrial sources (DEP 2002). Recent water quality improvements in the Canal have been spurred, in part, by the area's general transformation from industrial activity to residential and commercial uses. In addition, water quality improvements have resulted from Flushing Tunnel upgrades completed in 2014, including the installation of new screens and pumps that deliver an average 200 MGD of higher quality water from Buttermilk Channel to the Canal. DEP also completed upgrades to the Gowanus Wastewater Pumping Station and the sewer system in the area, which has resulted in decreased discharges of runoff and CSO to the Canal.

Water quality has improved in the Canal over time, especially following the reactivation of the Flushing Tunnel (AECOM 2015). **Table 9-1** presents recent water quality data (2012-2016) from DEP Harbor Survey stations GC3 and GC6, which are located in the Canal (see **Figure 9-3**). Both stations fall within Class SD waters, standards for which are included in **Table 9-1**. DEP's sampling efforts in the Canal during this time period focused on dissolved oxygen, fecal coliform, and enterococcus and did not include temperature, salinity, pH, secchi depth, or other basic water quality parameters.

Based on DEP Harbor Survey data from 2012 to 2016, average dissolved oxygen concentrations in surface waters were about 8.1 mg/L at the head of the Canal and 7.3 mg/L at the mouth of the Canal. Average concentrations at the bottom were 7.8 mg/L at the head of the Canal and 6.7 mg/L at the mouth. However, dissolved oxygen fell below the standard of 3.0 mg/L for Class SD waters 19 times at the surface and 22 times at the bottom at Station GC3 (near the head of the Canal), and fell below the standard 9 times at the surface and 15 times at the bottom at Station GC6 (near the mouth of the Canal).

Both fecal coliform and *enterococcus* levels were higher near the head of the Canal (Station GC-3) compared with the downstream station (Station GC-6). At Station GC3, average fecal coliform levels were 14,450 colony forming units per 100 milliliters (cfu/100mL) at the surface and 15,178 cfu/100mL in bottom waters; average enterococcus levels were 6,032 cfu/100mL at the surface and 2,361 cfu/100mL in bottom waters. Downstream at Station GC6 near the mouth of the Canal, average fecal coliform ranged from 11,657 cfu/100mL at the surface to 6,051 cfu/100mL at the bottom. Average enterococcus levels near the mouth of the Canal were 2,686 cfu/100mL at the surface and 1,040 cfu/100mL in bottom waters. Based on the available data from the DEP Harbor Survey for 2012-2016, enterococcus levels in the Canal generally exceeded the federal standard of 35 cfu/100 mL. Sufficient data were not available to determine compliance with the fecal coliform standard for this time period. Fecal coliform and enterococcus levels in the Canal are much higher compared with those in the Inner Harbor on the whole. The 2012 average fecal coliform and enterococcus concentrations in the Inner Harbor were 81.3 cfu/100mL and 6.2 cfu/100mL, respectively.

Table 9-1
Water Quality Data and NYSDEC Standards for Stations GC3 and GC6, 2012–2016

Parameter (NYSDEC Standard, SD Waters)	Station GC3						Station GC6					
	Surface Waters			Bottom Waters			Surface Waters			Bottom Waters		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Dissolved oxygen, mg/L *(Not less than 3.0 mg/L at any time)*	0.04	27.9	8.1	0.06	27.5	7.8	0.06	15.7	7.3	0.09	15.2	6.7
Fecal coliform , cfu/100mL *(Monthly geometric mean shall not exceed 200 cfu/100mL)*[(1)]	4	200,000	14,450	4	200,000	15,178	4	200,000	11,657	3	181,000	6,051
Enterococcus, cfu/100mL[(2)] *(None)*	4	196,000	6,032	4	53,000	2,361	4	90,000	2,686	4	72,000	1,040

Notes:
Data for basic parameters, including temperature, salinity, and total suspended solids, are not available for the Gowanus Canal stations during this time period.
(1) Fecal coliform standards are not based on the maximum fecal coliform values. Compliance with the fecal coliform standard is based on a monthly geometric mean comprising at least 5 measurements in the span of a month. Sufficient data are not available to calculate the fecal coliform standard for this time period.
(2) NYSDEC does not identify a standard for enterococcus; however, USEPA provides a standard for bathing of 35 cfu/100mL.
Sources: DEP Harbor Survey Water Quality Data 2012-2016; 6 NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations; USEPA Recreational Water Quality Criteria (Office of Water 820-F-12-058)

As part of USEPA's 2011 Remedial Investigation, surface water was collected from 27 sample locations along the length of the Canal in both dry-weather and wet-weather conditions. Copper and nickel were found to be the parameters exhibiting the highest potential risk to aquatic biota in the water column.[3] Total and dissolved copper exceeded their screening values at about one third of all sampling locations (11 out of 27), and nickel exceeded its screening value in 4 of 27 locations (USEPA 2011). Total copper was highest just upstream of the Owls Head Site near the 3rd Street bridge, and nickel was highest near the mouth of the Canal (USEPA 2011). Total and dissolved iron were found to be high-risk parameters, and total lead had the highest frequency of exceedance (21 of 26 locations). The maximum detected concentrations of both lead and iron were found at the 9th Street bridge, just downstream of the Owls Head Site (USEPA 2011). Polycyclic aromatic hydrocarbons (PAHs) were detected in surface waters throughout the Canal in 25 of 26 locations during dry-weather sampling and in 24 of 27 locations during wet-weather sampling; Polychlorinated biphenyls (PCBs) were not detected in any surface water samples (USEPA 2011). Maximum dry-weather PAH concentrations were detected near the mouth of the Canal, well downstream of either Project Site. Maximum wet-weather PAH concentrations were detected at the head of the turning basin below 6th Street, just downstream of the Owls Head Site.

SEDIMENT QUALITY

Complex flow patterns between the Hudson River Estuary, Long Island Sound, Newark Bay, Upper New York Bay, Lower New York Bay, and Raritan Bay lead to widely variable sediment characteristics throughout the area. Compared with elsewhere in the New York Harbor Complex, fine sediments from river, marine, and shoreline sources tend to accumulate at higher rates in dredged areas of the Upper Bay, Newark Bay, and Raritan Bay. Sediment in the Gowanus Canal consists of a dark gray to black mixture of sand, silt, and clay underlain by brown, tan, and light gray alluvial and marsh deposits (e.g., sand, silt, clay, and peat) of the Gowanus Creek complex that was present prior to construction of the Canal (USEPA 2011). The overlying soft sediment in the upper reach of the Canal ranges from 1 to 20 feet in thickness (average of 9.8 feet) and contains variable amounts of gravel, organic matter, and trash in addition to the sand/silt/clay mixture (USEPA 2011). The gravel is likely associated with gravel barges that traverse the Canal between the 5th and 9th Streets and adjacent to the New York City asphalt plant south of Hamilton Avenue.

As part of USEPA's 2011 Remedial Investigation, surface sediments 0 to 6 inches in depth were sampled at 27 locations along the length of the Canal. The degree of contamination in surface sediments was evaluated using a number of standards and criteria, collectively referred to as "screening values," including those from USEPA, NYSDEC, and other sources (USEPA 2010, NYSDEC 1999, Jones et al. 1997, WDOE 1995, and Buchman 2008 as cited in USEPA 2011). Metals generally had the highest frequency of exceedance of the screening values corresponding with potential impacts to benthic macroinvertebrates. Cadmium, copper, lead, mercury, and zinc concentrations exceeded their screening values in all samples (USEPA 2011). In particular, lead was found in high concentrations near the Owls Head Site from the Hamilton Avenue bridge upstream to the 3rd Street bridge (USEPA 2011). Low to moderate lead concentrations were found in the upper section of the Canal near the Head End Site (USEPA 2011). PAHs were found throughout the Canal, with the highest concentrations occurring in the middle portion between the 9th Street bridge and the turning basin below 5th Street, just downstream of the Owls Head Site. PCBs

[3] USEPA (2011) used USEPA's National Recommended Water Quality Criteria chronic values for saltwater and NYSDEC's surface water and groundwater quality standards at 6 NYCRR Part 703 as screening values to evaluate the potential for impacts to aquatic biota.

were detected in about one third of the sampling locations, and the maximum detection value occurred in the same section in the middle of the Canal where PAHs were also most prevalent. PAH concentrations were also high from Carroll Street to Degraw Street, just downstream of the Head End Site, but PCB concentrations in the same section were generally “non-detect” (USEPA 2011).

AQUATIC BIOTA

Historically, aquatic biota in the Canal have been severely restricted by poor water quality caused by discharges of industrial wastewater and surface runoff from MGPs and other industrial uses, CSO discharges, stormwater discharges, poor circulation of water, and poor sediment quality. Prior to the reactivation of the Flushing Tunnel in 1999, low dissolved oxygen levels exacerbated by lack of water circulation limited the available aquatic habitat at the head of the Canal (DEP 2008). Since reactivation of the Tunnel, fish and invertebrate species characteristic of the New York-New Jersey Harbor Estuary system have been found in the Canal.

Primary Producers and Zooplankton

Phytoplankton are microscopic plants whose movements within a waterbody are largely governed by prevailing tides and currents. Light penetration, turbidity, and nutrient concentrations are important factors in determining phytoplankton productivity and biomass. Zooplankton are primary grazers of phytoplankton and detritus and, in turn, serve as prey for higher trophic level organisms. The most abundant plankton species are copepods (*Acartia* spp.), a zooplankton arthropod found throughout the New York-New Jersey Harbor. Diversity and abundance of zooplankton and other planktonic organisms has improved since the reactivation of the Flushing Tunnel in 1999 and the planktonic organisms found at the head of the Canal are largely the same organisms found in Buttermilk Channel due to the transfer of water from the Channel by the Tunnel (DEP 2008).

Benthic Invertebrates

Complexity, diversity, and abundance of the benthic community in the Canal are low in comparison to a typical benthic community in the open waters of the New York-New Jersey Harbor Estuary. The community is dominated by opportunistic species that are common in disturbed habitats and are considered to be tolerant of organic pollution. Physical habitat characteristics such as sediment particle size, temperature, salinity, and dissolved oxygen influence distribution of these species within the Canal as well (GEI 2009). Major benthic invertebrate groups in the New York-New Jersey Harbor Estuary include: oligochaetes (aquatic earthworms), polychaetes (segmented worms), gastropods (snails), bivalves, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (EEA 1988, EA 1990, Coastal 1987, PBS&J 1998). Species of hydrozoans, chaetognaths, annelids, and decapods also occur in the Canal.

Tube dwelling amphipods and polychaetes are the dominant organisms in all reaches of the Canal (GEI 2009). Nematodes, oligochaete worms, and flatworms are abundant throughout the Canal as well. These groups prefer soft substrates and are fairly tolerant of high levels of organic matter. Side swimmer (*Gammarus* sp.) and shrimp (*Palaemonetes vulgaris*) can occur near the mouth of the Canal where it empties into the Gowanus Bay (GEI 2009). Epibenthic invertebrates[4] present in the Canal include polychaetes, crustaceans, amphipods, decapods, isopods, barnacles, bryazoans, and mollusca, all of which are common throughout the New York-New Jersey Harbor complex. Pacific shore crabs (*Hemigrapsus sanguineus*), green crabs (*Carcinus maenas*), and mud crabs (*Scylla serrata*) also occur in the Canal. Sea

[4] Epibenthic organisms are those that live on top of rather than buried in the sediment.

grapes (*Molgula manhattensis*), blue mussels (*Mytilus edulis*), clam worms (*Nereis succinea*), blue crab (*Callinectes sapidus*), and spider crab (*Libinia emarginata*) occur in Gowanus Bay and have also been found in the Canal (DEP 2008).

Finfish

The finfish community in the New York-New Jersey Harbor and connected waterbodies is typical of large coastal estuaries and inshore waterways along the Mid-Atlantic Bight and includes a variety of estuarine, marine, catadromous (migrating from fresh water to spawn in salt water), and anadromous (migrating from salt water to spawn in fresh water) fish species that use its waters for spawning, nursery, migratory, and foraging purposes. Overall, the fish community of the Harbor, including Gowanus Canal, is spatially and seasonally dynamic. While some finfish species can occur in the Canal year-round, such as cunner (*Tautogolabrus adspersus*) and tautog (*Tautoga onitis*), the majority of the finfish community in the Canal is dominated by migratory species common to the region such as those listed below. While many species may occur in the Canal, especially near its confluence with Gowanus Bay, as part of their movement patterns, few are likely to remain in substantial numbers.

A 2003-2004 fish survey conducted on behalf of USACE throughout the Canal and Bay collected a number of fish species including cunner, tautog, bay anchovy (*Anchoa mitchilli*), Atlantic menhaden (*Brevoortia tyrannus*), windowpane (*Scophthalmus aquosus*), unidentified wrasse (Labridae), grubby (*Myoxocephalus aenaeus*), Atlantic herring (*Clupea harengus*), Atlantic mackerel (*Scomber scombrus*), weakfish (*Cynoscion regalis*), Atlantic croaker (*Micropogonias undulatus*), winter flounder (*Pseudopleuronectes americanus*), unidentified Gadidae, northern pipefish (*Syngnathus fuscus*), and Atlantic silverside (*Menidia menidia*) (LMS et al. 2004, as cited in GEI 2009). A sampling program conducted in 2010 for the USEPA (2011) Remedial Investigation also collected mummichog (*Fundulus heteroclitus*), three-spined stickleback (*Gasterosteus aculeatus*), rock gunnel (*Pholis gunnellus*), American eel (*Anguilla rostrata*), striped bass (*Morone saxatilis*), northern puffer (*Sphoeroides maculatus*), spotted hake (*Urophycis regia*), Atlantic tomcod (*Microgadus tomcod*), and white perch (*Morone americana*) (USEPA 2011, Appendix K). Eggs were the most dominant life stage collected, followed by post yolk-sac larvae, then yolk-sac larvae. However, based on the available survey results, there was no evidence that spawning by any species occurs in any part of the Canal, although some spawning likely occurs within the Gowanus Bay (DEP 2008). Eggs and larvae collected in the Canal were dominated by pelagic species, indicating that the eggs and larvae likely drifted, possibly by being drawn into the Canal from Buttermilk Channel through the Flushing Tunnel, or from the Bay via incoming tide (GEI 2009). Bay anchovy and winter flounder post yolk-sac larvae were observed in the greatest densities at the head of the Canal and in the Gowanus Bay. However, the absence of demersal winter flounder eggs in the Canal, despite the observation of post yolk-sac larvae, suggests that these larvae were transferred to the Canal via either the Flushing Tunnel or the incoming tide (DEP 2008, GEI 2009).

Essential Fish Habitat

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The NMFS designates EFH within squares identified by latitude and longitude coordinates. The project site is within a portion of two EFH areas. The mouth of the Gowanus Canal is included in the EFH square defined as: Atlantic Ocean waters within the Hudson River estuary affecting Staten Island, from Port Richmond, NY, on the north, west around to Great Kills South Harbor of Great Kills, NY, and south of Bayonne, NY. The majority of the Canal upstream of the mouth is included in the EFH square defined as: Atlantic Ocean waters within the Hudson River estuary affecting Manhattan Island, New York City, College Point, Long Island City, Brooklyn, Port Morris, Unionport, Flushing Bay, Astoria, LaGuardia Airport, Badland Island, Rikers Island, Roosevelt Island, Wards Island, and Hells Gate, along with the East

River, the Harlem River, and the Bronx River. **Table 9-2** lists the species for which EFH is designated and the life stages of those fish identified as having EFH in these squares. **Appendix 9-1** provides a full assessment of the EFH in the vicinity of the Project Sites.

Table 9-2
Essential Fish Habitat Designated Species in the Vicinity of the Project

Species	Designated Life Stage			
	Eggs	Larvae	Juveniles	Adults
Pollock (*Pollachius virens*)			X	X
Red hake (*Urophyscis chuss*)	X	X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Windowpane flounder (*Scophthalmus aquosus*)	X	X	X	X
Atlantic sea herring (*Clupea harengus*)		X	X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Long finned squid (*Loligo pealeii*)	N/A	N/A		
Short finned squid (*Illex illecebrosus*)	N/A	N/A		
Atlantic butterfish (*Peprilus triacanthus*)		X	X	X
Atlantic mackerel (*Scomber scombrus*)			X	X
Summer flounder (*Paralichthys dentatus*)		X	X	X
Scup (*Stenotomus chrysops*)	X	X	X	X
Black sea bass (*Centropristis striata*)	N/A		X	X
Surf clam (*Spisula solidissima*)	N/A	N/A		
Ocean quahog (*Artica islandica*)	N/A	N/A		
Spiny dogfish (*Squalus acanthias*)	N/a	N/A		
King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Cobia (*Rachycentron canadum*)	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata*)			X	X
Sand tiger shark (*Carcharias taurus*)		X(1)		
Dusky shark (*Carcharhinus obscurus*)		X(1)	X(1)	
Sandbar shark (*Carcharhinus plumbeus*)		X(1)		X(1)

Notes:
N/A—insufficient data for this life stage exists and no EFH designation has been made.
(1) These species do not have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, “larvae” for sand tiger, dusky, and sandbar sharks refers to neonates and early juveniles.
Sources:
National Marine Fisheries Service. “Summary of Essential Fish Habitat (EFH) Designation” posted at https://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/conn_li_ny/40407350.html, https://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/new_jersey/40307400.html, and http://www.nero.noaa.gov/hcd/skateefhmaps.htm
National Marine Fisheries Service EFH Mapper accessed online at http://www.habitat.noaa.gov/protection/efh/habitatmapper.html

TERRESTRIAL RESOURCES

ECOLOGICAL COMMUNITIES

Ecological communities within the Project Sites are limited to what are best described by Edinger et al. (2014) as Terrestrial Cultural[5] and Open Uplands[6] communities which includes paved road/path[7], urban vacant lot[8], and urban structure exterior[9] and successional old field[10] communities (see **Figures 9-4 and 9-5a through 9-5d**). Ecological communities within the study area are commonly found throughout the greater New York City metropolitan area. Vegetation within these communities is sparse and limited to street trees including bald cypress (*Taxodium distichum*), cherry (*Prunus* sp) white oak (*Quercus alba*) and other oaks (*Quercus* sp); or ruderal species (i.e., vegetation tolerant of disturbed habitat) including tree of heaven (*Ailanthus altissima*), white mulberry (*Morus alba*), common mugwort (*Artemisia vulgaris*), and crabgrass (*Digitaria* sp). Similar ecological communities are found within the immediate vicinity of the Project Sites. In addition, the Thomas Greene Playground and public pool are located adjacent to the Head End Facility. Vegetation within these NYC Parks facilities is predominantly London plane trees (*Platanus acerifolia*) within street tree pits.

The Gowanus Canal Conservancy operates a native plant nursery out of a portion of the City of New York Department of Sanitation (DSNY) facility at the Owls Head Site. Native plants tolerant of urban conditions are grown and sold to the public from this location. The northern shoreline of the Owls Head Site is more vegetated than other portions of the Project Sites and is best classified as a successional old field ecological community. Dominant vegetation in this portion of the Owls Head Site includes black locust (*Robinia pseudoacacia*), eastern cottonwood (*Populus deltoides*), tree of heaven, common mugwort, and orchard grass (*Dactylis glomerata*). In addition, as discussed under “Wetlands,” two small areas along the Owls Head Site shoreline are dominated by saltmarsh cordgrass and are considered intertidal marsh.

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[5] Edinger et al. 2014 defines this subsystem of ecological communities as “communities that are either created and maintained by human activities, or are modified by human influence to such a degree that the physical conformation of the substrate, or the biological composition of the resident community is substantially different from the character of the substrate or community as it existed prior to human influence.”

[6] Edinger et al. 2014 defines this subsystem of ecological communities as “communities with less than 25 percent canopy cover of trees; the dominant species in these communities are shrubs, herbs, or cryptogammic plants (mosses, lichens, etc.).”

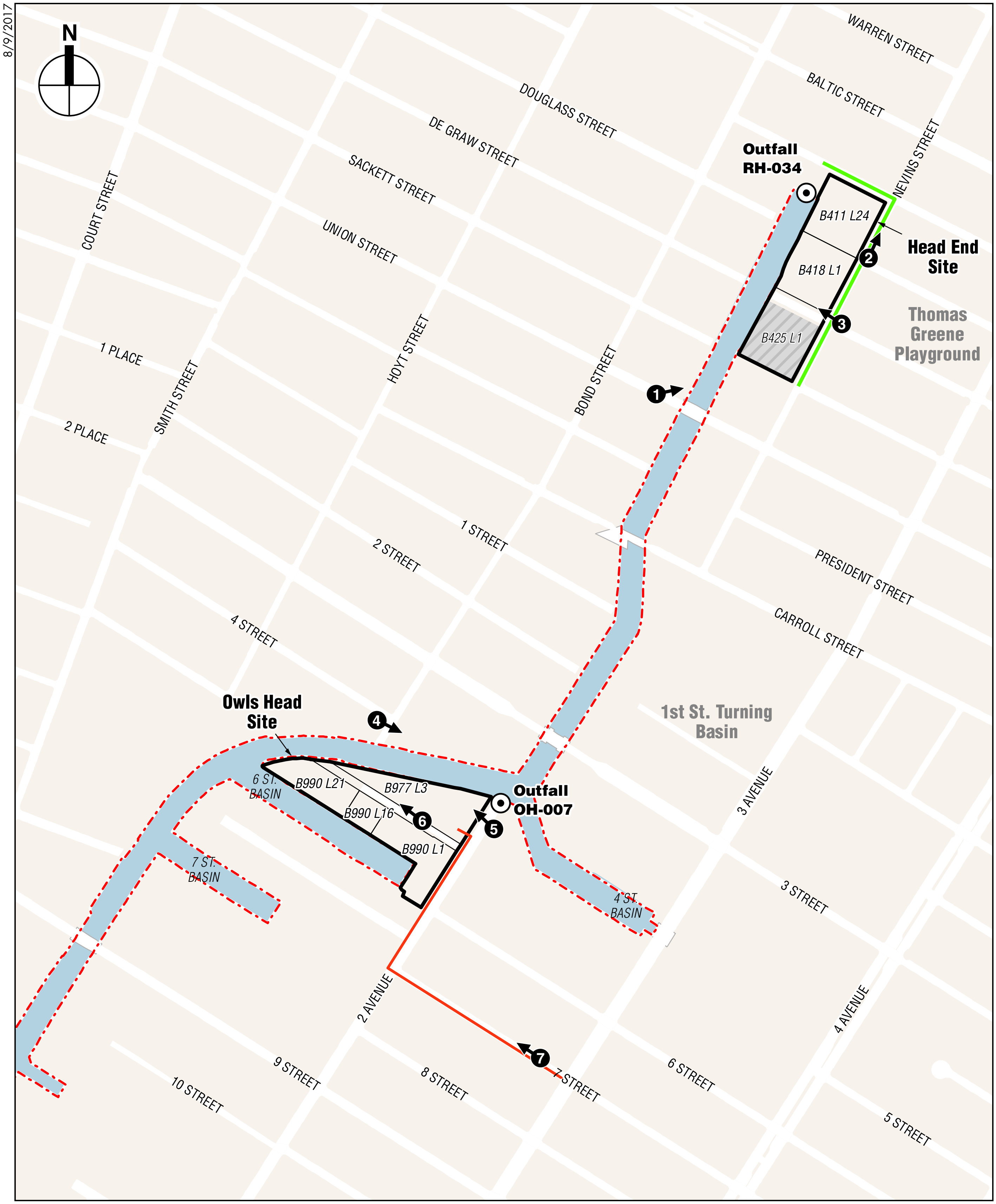
[7] Edinger et al. 2014 describes this ecological community as “a road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface.”

[8] Edinger et al. 2014 describes this ecological community as “an open site in a developed, urban area that has been cleared either for construction or following the demolition of a building. Vegetation may be sparse, with large areas of exposed soil, and often with rubble or other debris.”

[9] Edinger et al. 2014 describes this ecological community as “the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks. Nooks and crannies may provide nesting habitat for birds and insects, and roosting sites for bats.”

[10] Edinger et al. 2014 describes this ecological community as “a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned.”

8/9/2017



Project Sites

Gowanus Canal

Construction Staging Areas

Outfall Locations

New Force Main

In-street Sewer Line Improvements

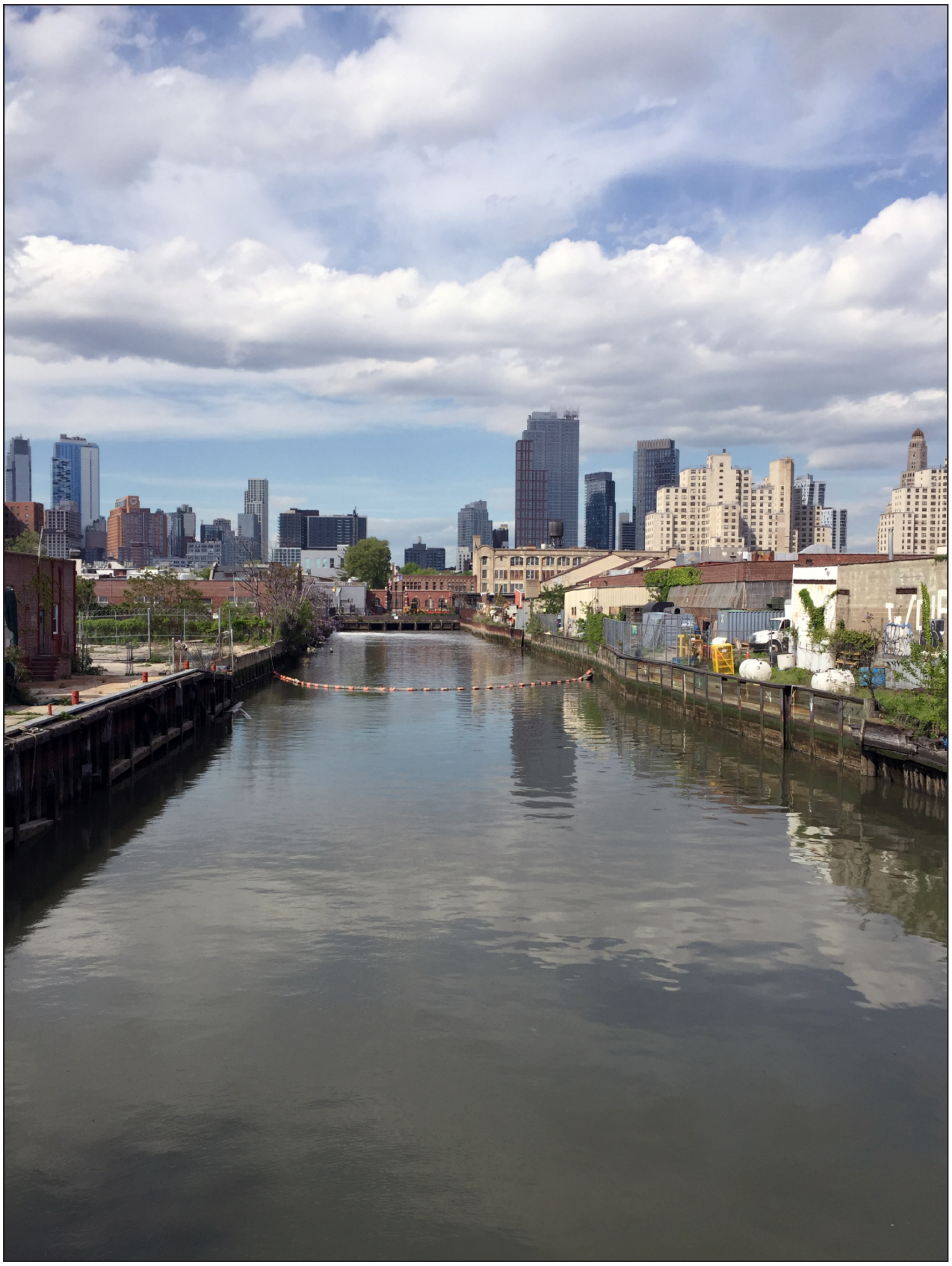
Photograph View Direction and Reference No.

0 1,000 FEET

Gowanus Canal CSO Facilities

Photograph Key

Figure 9-4



View of Head End Facility site from Union Street Bridge, facing northeast. **1**

View along Nevins Street of the Head End Facility site, facing north. **2**

View along Degraw Street of the Head End Facility site, facing west. **3**

View of the Owls Head Facility site from Bond Street, facing east. **4**

View of the Owls Head Facility site from 2nd Avenue, facing northwest. **5**

Photographs

Figure 9-5c

View along 5th Street of the Owls Head Facility site, facing northwest. **6**

View of the proposed force main location along 7th Street, facing northwest. **7**

WILDLIFE

The study area provides limited natural terrestrial wildlife habitat; it is a highly industrialized area with asphalt, concrete, granite pavers, unvegetated compacted soil, and sparse vegetation along the perimeter. As such, only the most urban-adapted, generalist species that can tolerate highly degraded environments and high levels of human activity currently have the potential to occur within the study area.

Mammals

Habitat is limited within the study and is likely used by only the most urban-adapted species including Norway rat (*Rattus norvegicus*), feral cat (*Felis catus*), raccoon (*Procyon lotor*) and gray squirrel (*Sciurus carolinensis*). No mammals were observed during the February 23, 2017 reconnaissance investigation.

Birds

The New York State Breeding Bird Atlas documents the distribution of breeding bird species throughout the state and is based on surveys that were most recently conducted from 2000 to 2005. The study area is located within portions of survey Blocks 5750D and 5850C, which also includes Prospect Park. A total of 64 possible species of breeding birds were documented in this survey block (see Table 1 in **Appendix 9-2**). The two 3-square-mile survey blocks include habitat that supports these species (e.g., Prospect Park); the smaller study area, however, contains habitat suitable for only the most urban-adapted birds. Most species expected to occur are disturbance-tolerant generalists that can thrive in highly modified and degraded habitats and are ubiquitous in urban settings (e.g., rock pigeon [*Columba livia]*, mourning dove [*Zenaida macroura*], American robin [*Turdus migratorius*], northern mockingbird [*Mimus polyglottos*], European starling [*Sturnus vulgaris*], and house sparrow [*Passer domesticus*]). Many of these species that may be present in the study area during the breeding season may also be year-round resident birds that remain during winter. The only birds observed during the February 23, 2017 reconnaissance investigation were rock pigeon and house sparrow.

Reptiles and Amphibians

The NYSDEC Amphibian and Reptile Atlas Project (Herp Atlas) conducted a survey between 1990 and 1999 documenting the geographic distribution of New York’s reptiles and amphibians. Table 2 in **Appendix 9-2** lists the 12 species of reptiles and amphibians documented by the Herp Atlas as occurring within the *Brooklyn* USGS Quadrangle. However, due to the fully developed nature of the study area and limited natural habitat, no reptiles and amphibians are expected to occur within the study area.

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES

According to the USFWS IPaC database[11] reviewed on February 22, 2017, the following four federally listed species are documented for Kings County: piping plover (*Charadrius melodus*; threatened), red knot (*Calidris canutus rufa*; threatened), roseate tern (*Sterna dougallii dougallii*; endangered), and seabeach amaranth (*Amaranthus pumilus*; threatened). Critical habitat is listed only for piping plover.

The NYSDEC Environmental Resource Mapper[12] and New York Nature Explorer[13] were reviewed on February 22, 2017 and no recently confirmed state-listed species are documented within 0.5 miles of the study area. Therefore, no state listed species are expected to occur within the study area.

[11] USFWS IPaC database available at http://ecos.fws.gov/ipac.

[12] DEC Environmental Resource Mapper available at http://www.dec.ny.gov/gis/erm.

Piping Plover

The breeding population of piping plovers in New York City is limited to the Rockaway Peninsula in Queens County (Fowle and Kerlinger 2001, Boretti et al. 2007). In addition, the study area lacks wide, open expanses of unvegetated beach that piping plover utilize for habitat. Therefore, piping plover do not have the potential to occur within the study area.

Red Knot

The *rufa* subspecies of the red knot migrates up to 30,000 miles round trip between primary wintering grounds in South America and breeding grounds in the high arctic, with conditions for refueling at staging sites along the Atlantic coast being critical determinants of migration and reproductive success and overall survival (Baker et al. 2004, Morrison et al. 2007). Although migrating red knots have been observed on Jamaica Bay (Tanacredi and Badger 1995:104, Fowle and Kerlinger 2001:81), the study area does not include beaches, bays, or estuaries that red knot use for staging and none were observed during the reconnaissance investigation. Therefore, red knot are not expected to occur within the study area.

Roseate Tern

The roseate tern is globally widespread but has a highly localized distribution and is listed as federally endangered in the U.S. More than 90 percent of New York State's breeding population of roseate tern is made up of a single colony on Great Gull Island, off Long Island's eastern end (Hays 2007, Mitra 2008). The remainder of the state's roseate tern population is in small groups of breeding pairs in various locations on Long Island's south shore and east end (Mitra 2008, NYSERDA 2010). The study area lacks the type of unvegetated, sandy beach that breeding and migrating roseate terns use for habitat and none were observed during the reconnaissance investigation. Therefore, roseate terns are considered unlikely in the study area.

Seabeach Amaranth

Seabeach amaranth is an annual herbaceous plant. It grows along sandy beaches of the Atlantic coast where there is accreting shoreline, upper beach, foredune, or overwash flat; as well as at beach nourishment sites (USFWS 2012). These habitats do not occur within the study area. Therefore, seabeach amaranth does not have the potential to occur in the study area.

D. FUTURE CONDITIONS IN THE ANALYSIS YEAR

This section describes other projects planned or expected to be constructed within the study areas by the Project's analysis year, 2028, in addition to the clean-up activities in the area that are independent of the Project that would have the potential to affect natural resources.

As described in Chapter 1, "Project Description," the Project is part of the federally required Superfund remediation of the Gowanus Canal, mandated by the USEPA. USEPA and NYSDEC have also mandated that other parties undertake clean-up activities in the area of the Canal independent of the Project, including the installation of containment/cutoff walls, the excavation or stabilization of contamination on upland parcels along the Canal, the dredging of the Canal, the restoration of the 1st Street and 4th Street turning basins, and the installation of coal tar extraction wells.

Components of the overall remediation plan for the Canal include dredging approximately 307,000 cubic yards of highly contaminated sediment and 281,000 cubic yards of contaminated sediment from the bottom

[13] New York Nature Explorer available at http://www.dec.ny.gov/natureexplorer/app.

of the Canal (USEPA 2013). Other responsible parties, independent of the Project, will dredge the highly contaminated sediments from the upper and middle sections of the Canal (i.e., from the Head End to Hamilton Avenue Bridge), and contaminated sediments from the lower section of the Canal (i.e., from the Hamilton Avenue Bridge to the mouth of the Canal). A multi-layer cap (i.e., treatment layer, isolation layer, and armor layer) will be placed over dredged portions of the Canal.

In addition, three commercial projects in the vicinity of the Head End Site and four commercial projects in the vicinity of the Owls Head Site will be completed by 2028.

Without the Project at the Head End Site, outfall RH-038 would not be modified and would continue to operate as it currently does, as would outfalls RH-033, RH-034, RH-036, and RH-037. The Head End Facility is located within the boundaries of the former Fulton Municipal Works Gas Plant and would continue to be investigated and remediated by National Grid. National Grid will conduct work on the bulkhead of the Head End Facility, as part of the contaminant removal and remediation process (i.e., construct containment walls, install coal tar extraction wells, and excavate or stabilize MGP-related contamination on the Head End Facility parcels), as described in Chapter 10, “Hazardous Materials.”

In the absence of the Project at the Owls Head Site, modifications would not be made to the existing sewer infrastructure, existing outfall OH-007 would not be reconstructed, flow through outfall OH-007 would not be diverted or decreased, and outfall OH-007 would continue to operate as it currently does. The bulkhead at the Owls Head Site would not be replaced in connection with the construction of the Owls Head Facility, although it could be replaced as part of the USEPA’s in-canal remedy. The DSNY salt storage yard and community sponsored composting area would not be modified or relocated, and the manufacturing and automobile-related business on the adjacent parcels would remain. The Owls Head Facility parcels have not been the subject of any formal environmental investigations. However, the Citizens Gas Works MGP site, on the western bank of the Canal near these parcels, will be remediated independent of the Project.

No changes to floodplains or threatened, endangered, and special concern species are expected to occur by 2028 in the absence of the Project. Temporary disturbances to terrestrial resources, including the relocation of wildlife species will occur as a result of National Grid’s remediation. However, the remediation efforts will improve groundwater, surface water, and sediment quality due to the removal of contaminated soil and sediment. The dredging throughout the Canal, and the bulkhead work at the Head End Site, will result in temporary re-suspension of sediments and contamination within the water column of the Canal, resulting in temporary impacts to both aquatic resources and wetlands. However, the overall remediation efforts being undertaken for the Canal will result in permanent improvements to aquatic resources and wetlands.

E. PROBABLE IMPACTS OF THE PROJECT

GROUNDWATER

As discussed under “Existing Conditions,” groundwater in Brooklyn is not used as a potable water supply. Project-related activities would include subsurface disturbance at the Head End Site and the Owls Head Site that are expected to encounter groundwater and require dewatering.

As discussed in Chapter 10, “Hazardous Materials,” to avoid exposing construction workers and the general public to existing groundwater contaminants, demolition, disposal, excavation, dewatering, and other construction activities associated with the Head End Facility, Owls Head Facility, and force main would be performed in accordance with all applicable federal, state, and local regulations and guidelines. Also as discussed in Chapter 10, construction and operation of the Project would not result in the introduction of any new groundwater contaminants. Therefore, the Project would not result in significant adverse impacts with respect to groundwater.

FLOODPLAINS

As discussed under "Existing Conditions," the Head End Facility, Owls Head Facility, and force main would all be constructed within the 100-year floodplain. Construction and operation of the Project would not result in any significant adverse impacts to flood levels, flood risk, or the flow of flood waters and would not impact the designated flood hazard area. Moreover, since the study area is subject to coastal flooding, the new above-ground structures introduced by the Project into the floodplain would not result in increased flooding of adjacent areas. Similar to other portions of New York City, Brooklyn and in particular the area surrounding the Gowanus Canal, is affected by local stormwater flooding (e.g., flooding of inland portions of the City from short-term, high-intensity rain events in areas with poor drainage), fluvial flooding (e.g., streams overflowing their banks), and coastal flooding (e.g., long and short wave surges that affect the shores of the Atlantic Ocean, bays such as Gowanus Bay, and tidally influenced canals, creeks and rivers [FEMA 2013]). Within New York City, coastal flooding is the primary cause of flood damage. The floodplain within and adjacent to the Project Sites is affected by coastal flooding and would not be affected by construction or regrading/filling of the floodplain as would occur within a riverine floodplain. Coastal floodplains are influenced by astronomic tide and meteorological forces (e.g., nor'easters and hurricanes) rather than local flooding caused by precipitation (FEMA 2013). Therefore, the occupancy of the floodplain by the Project would not affect the flood elevation or increased risks due to flooding in the vicinity of the Project sites. Therefore, the Project would not result in significant adverse impacts with respect to flood hazard areas.

WETLANDS

CONSTRUCTION

As discussed under "Existing Conditions," the Gowanus Canal is an NWI-mapped estuarine sub-tidal wetland and a NYSDEC-mapped littoral zone tidal wetland that are subject to regulation as a Water of the United States. Modifications to outfall RH-038 at the Head End Site may result in the temporary disturbance of approximately 550 square feet of NYSDEC littoral zone tidal wetland due to installation of a turbidity curtain and temporary cofferdam but no permanent impacts to NYSDEC littoral zone tidal wetland in the vicinity of the outfalls**.**

Construction of outfall OH-007 at the Owls Head Site would have the potential to result in the temporary disturbance of about 500 square feet of NYSDEC littoral zone tidal wetlands in the immediate vicinity of the outfall location due to installation of a turbidity curtain and temporary cofferdam, and approximately 650 square feet (0.01 acres) of permanent impacts to NYSDEC littoral zone tidal wetland within the footprint of the replacement bulkhead extending approximately two feet waterward into the Canal. This minimal loss would not result in significant adverse impacts to NYSDEC littoral zone wetlands. Portions of the Owls Head Facility would be constructed within the NYSDEC-regulated tidal wetland adjacent area (see **Figure 9-2c**). Construction of the Owls Head Facility would be required to adhere to Development Restrictions outlined by the Tidal Wetland regulations (6 NYCRR PART 661), including a 30-foot setback of all permanent structures from the NYSDEC-mapped tidal wetland boundary and restricting impervious surface within the Project Site to a maximum of 20 percent, including existing and new structures. Should the design of the Owls Head Facility not meet the Development Restrictions, DEP would be required to request a variance under 6 NYCRR PART 661.11 (or its equivalent under CERCLA). Finally, construction of the force main would only occur in upland areas. DEP will explore options for avoiding impacts to wetlands. However, if impacts to wetlands are unavoidable, DEP will explore mitigation options with USACE, NYSDEC, and USEPA, particularly for the small areas of vegetated marsh near the Owls Head Facility.

Sediment and Erosion Control protective measures, such as turbidity curtains, silt fences, and inlet (catch Basin) protection, would be utilized in accordance with the Stormwater Pollution Prevention Plan (SWPPP) to prevent and minimize indirect impacts to wetlands within the study area. All construction activities that would take place within waters of the United States and NYSDEC littoral zone tidal wetlands would be completed in compliance with any conditions required by the USACE under Section 404 of the Clean Water Act and NYSDEC under Articles 15 and 25 of the NY ECL, or through equivalent approvals.

OPERATION

The Project would increase CSO capture for overflows that would otherwise be discharged from CSO outfalls RH-034 and OH-007 to the Canal. Therefore operation of the Project would not result in any significant adverse impacts to wetlands.

AQUATIC RESOURCES

Components of the Project that have the potential to impact aquatic resources include the possible installation and removal of cofferdams during outfall construction, demolition and removal of the existing OH-007 outfall, replacement of the bulkhead at the Owls Head Site, modifications to the RH-038 outfall, and elimination and diversion of CSO volume that may be discharged to the Canal from existing outfalls.

WATER QUALITY

Construction

Construction of the Project would have the potential to result in temporary effects to water quality resulting from sediment re-suspension during the possible placement and removal of a cofferdam at outfall OH-007 and potentially at outfall RH-038. In general, installation of cofferdams constructed with sheet piles does not result in significant levels of sediment disturbance. The greatest potential for increased turbidity typically occurs when the cofferdam is removed (MPCA 2017). Sediment disturbance associated with installation and removal of the cofferdam is anticipated to result in minor, short-term increases in re-suspended sediment and re-deposition of contaminants, which would be contained within a turbidity curtain put in place before the sheet pile is driven and before the cofferdam is removed.

The demolition and reconstruction of outfall OH-007 would be completed within the cofferdam, which would be driven outboard of the toe of the existing shoreline stabilization, minimizing potential increases in suspended sediment and adverse impacts to water quality due to the Project. Installation of the new bulkhead at the Owls Head Facility would also have the potential to result in sediment resuspension. Increases in suspended sediment associated with installation and removal of the cofferdam and the installation of a new bulkhead at the Owls Head Facility would be temporary and would be contained within a turbidity curtain. Operation of the Flushing Tunnel has improved water circulation in the Canal, and any re-suspended sediment from installation or removal of the turbidity curtains would be expected to dissipate relatively quickly with the flow of water and are not anticipated to result in significant adverse impacts to water quality. Demolition and reconstruction of outfall OH-007 would be conducted within cofferdams and would not result in additional sediment re-suspension or subsequent adverse impacts to water quality. Therefore, any sediment disturbance during construction would not result in significant adverse impacts to water quality. Finally, no in-water construction activities would be required for installation of the force main.

Upland demolition and construction activities, including force main construction and shoreline stabilization (i.e., bulkhead replacement), would be undertaken in accordance with erosion and sediment control plans and best management practices incorporated into the SWPPP prepared for the Project, as required under the

SPDES General Permit for Construction Activities, and would not result in adverse impacts to water quality from stormwater discharge during construction. This would include all staging areas, and any areas used for the temporary storage of excavated material. All groundwater recovered during dewatering would be treated and discharged to the Canal, as needed for the force main construction, in accordance with applicable regulatory requirements and as discussed in Chapter 10 “Hazardous Materials.”

Operation

Once operational, the Owls Head Facility and Head End Facility would provide ongoing benefits to water quality in the Canal. The number of CSO events will be reduced, benefitting water quality. Specifically, the CSO volume discharged from outfall RH-034 at the Head End Site would be reduced by approximately 76 percent, and the CSO volume discharged from outfall OH-007 at the Owls Head Site would be reduced by approximately 85 percent.

SEDIMENT QUALITY

Construction

Installation and removal of cofferdams would result in temporary increases in suspended sediment containing varying levels of contamination. Any sediments and associated contaminants re-suspended during installation and removal of the cofferdams are expected to be contained within the turbidity curtains. Any re-suspended sediment resulting from installation removal of the turbidity curtains would be localized and would dissipate relatively quickly with the improved water flow provided by the Flushing Tunnel. Re-suspended sediment would settle out over sediment with similar levels of contamination, and thus would not result in adverse impacts to sediment quality. Demolition and reconstruction of outfall OH-007 would be conducted within a cofferdam, and installation of the bulkhead at the Owls Head Facility within a turbidity curtain, and would not result in increased turbidity or contaminant re-suspension in the Canal.

Erosion and sediment control measures implemented in accordance with the SWPPP prepared for the Project would minimize the discharge of sediment to the Canal during demolition and construction activities, including shoreline stabilization, and are not anticipated to result in significant adverse impacts to sediments in the Canal. All contaminated material, including sediments excavated and removed during construction activities, would be disposed of in accordance with applicable regulatory requirements, as described in Chapter 10 “Hazardous Materials.”

Operation

As discussed in Chapter 11, “Water and Sewer Infrastructure,” the Project would result in a 76 percent solids load reduction by volume basis for the Head End Facility and an estimated 85 percent solids load reduction by volume basis for the Owls Head Facility. Rather than entering the Canal through these outfalls, CSO solids would instead be subject to settling processes (i.e., passage through screens, removal by degritting pumps) prior to conveyance to the Red Hook and Owls Head WWTPs.

AQUATIC BIOTA

Construction

The in-water construction activities described above would have the potential to result in temporary adverse effects on fishes and benthic macroinvertebrates in a localized area surrounding the construction due to temporary increases in suspended sediment and underwater noise during cofferdam installation and removal. These potential effects, described below, would be temporary, only lasting as long as the duration for in-water construction activities (approximately 6 to 9 months) and would not result in significant adverse impacts to the aquatic community.

Suspended Sediment

Life stages of estuarine and anadromous fish and macroinvertebrate species are generally tolerant of elevated suspended sediment concentrations and have evolved behavioral and physiological mechanisms for dealing with variable and potentially high concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, LaSalle et al. 1991, Nightingale and Simenstad 2001). As discussed above, aquatic biota found in the Gowanus Canal also tend to be pollution-tolerant. Any sediment re-suspension that would occur during in-water work would be temporary, minimal, and localized, and would be well within suspended sediment tolerance thresholds of larval fish and benthic macroinvertebrates found in estuarine environments. Additionally, because fish are mobile and generally avoid unsuitable conditions such as high suspended sediment concentrations (Clarke and Wilber 2000), the effects of habitat avoidance would not significantly affect their condition, fitness, or survival. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity.

Sheet pile cofferdams and turbidity curtains would be installed prior to the commencement of in-water construction activities associated with demolition and construction of outfall OH-007, and turbidity curtains would be installed prior to installing the bulkhead at the Owls Head Facility, and would be removed when the work is completed (likely after 6 to 9 months). There would be minimal sediment re-suspension associated with the installation and removal of each cofferdam. As discussed above, any temporary increase in suspended sediment associated with in-water construction activities would be localized and would dissipate following cessation of the sediment disturbing activity. Installation and removal of the cofferdams would be an intermittent disturbance, and would therefore have a limited effect on suspended sediment concentrations within any given location during the course of construction. The flow of water through the Canal, as influenced by the Flushing Tunnel and tidal processes, would help to dissipate any re-suspended sediments such that re-deposition in the Canal would not adversely affect benthic macroinvertebrates or bottom-dwelling finfish. Demolition and reconstruction of outfall OH-007 would be contained within the cofferdams, and the installation of the bulkhead within turbidity curtains, and would not result in additional sediment re-suspension that could affect aquatic biota.

Underwater Noise

Most construction activities would be conducted on land and delivery, and removal of materials are assumed to occur by truck and not by water. Therefore, there would be no increase in vessel activity and associated underwater noise as a result of the Project. Installation and removal of steel sheetpile cofferdam walls, and sheet pile bulkhead at the Owls Head Facility with a vibratory hammer would result in a temporary increase in underwater noise during installation of each sheet pile section. Elevated underwater noise would be temporary, as the cofferdams and bulkhead would be installed over a period of 6 to 9 months. Installation of the sheetpile for the cofferdam structures would result in temporary increased underwater noise levels that would not be expected to exceed the threshold for physiological injury to fishes.[14] Fish would likely avoid portions of the Canal in the vicinity of sheetpile installation above the behavioral threshold (150 dB SPLrms) that would occur within 150 to 300 feet of the pile-driving activity. The Canal is narrow at both the Head End and Owls Head Sites, and its full width would likely have

[14] For vibratory driving of steel sheetpile, typical noise levels at a distance of 33 feet from the pile have been reported as 175 dB SPLpeak, 160 dB SPLrms, and 160 dB for the 1-second SEL. These sound levels are continuous rather than percussive and would not exceed the threshold of 206 dB SPLpeak that is associated with the onset of recoverable physiological injury to fishes.

elevated underwater noise levels (i.e., ensonified, >150 dB SPLrms) during vibratory driving of the sheetpile cofferdam sections. Most of the Canal between the two outfall locations and downstream of outfall OH-007 would be non-ensonified (< 150 dB SPLrms) at any given time during sheetpile installation. Since most finfish that occur in the Canal are migratory rather than resident species, and generally occur in higher numbers near the confluence of the Canal with Gowanus Bay downstream of both Project sites, fish would likely be able to avoid the ensonified portions of the Canal during pile driving. The temporary loss of potential foraging habitat within and in the vicinity of the ensonified area near the cofferdams, when compared with similar habitat that would be available in the vicinity, would not result in a significant adverse impact to aquatic biota. For these reasons, the temporary increase in underwater noise during construction of the Project would not have significant adverse effects on aquatic biota.

Loss of Water Column Habitat

In-water construction activities at outfall RH-038 would result in a temporary loss of approximately 550 square feet of habitat and associated water column within the cofferdam and turbidity curtain. Construction on this outfall is currently planned to occur on land. The use of a cofferdam and turbidity curtain at outfall OH-007 would result in the temporary loss of 500 square feet of habitat and associated water column. The exclusion of aquatic organisms from the area within the cofferdams would constitute a temporary loss of a minimal area of potential foraging habitat. Because similar habitat would still be available nearby, this temporary loss of a minimal area of habitat would not result in a significant adverse impact to aquatic biota. Fish and benthic organisms would be expected to return to the construction areas when the in-water work is complete and the cofferdams are removed.

Operation

As discussed above, the reduction and treatment of CSO discharged to the Canal, will contribute to improvements in water and sediment quality, and therefore, will help to improve aquatic habitat for the migratory species that occur in the area. The waterward installation of the shoreline stabilization will result in the loss of approximately 650 square feet of bottom and associated water column habitat along approximately 320 linear feet of shoreline at the Owls Head site (mudline to MHW). This minimal loss of habitat similar to that found throughout the Canal would not be expected to result in significant adverse impacts to aquatic biota.

ESSENTIAL FISH HABITAT

For the reasons identified above, and described in detail in the EFH assessment included in **Appendix 9-1**, construction and operation of the Project would not result in any significant adverse impacts to water quality, aquatic habitat, or aquatic biota of the Canal. Therefore, the Project would not result in significant adverse impacts to the suitability of the Project site for fish species identified by NMFS as having EFH in the Canal.

TERRESTRIAL RESOURCES

ECOLOGICAL COMMUNITIES

Construction

As discussed under "Existing Conditions," ecological communities within the study area are limited to Terrestrial Cultural and Open Uplands communities that are regionally common and sparsely vegetated. Construction of the Head End Facility and Owls Head Facility would result in the loss of these ecological communities commonly found within New York City and would not result in significant adverse impacts to these resources. Construction of the Project would result in the removal of up to four street trees at the

Head End Site and no trees at the Owls Head Site. However, all work would be performed in compliance with Local Law 3 of 2010 and the NYC Parks Tree Protection Protocol. DEP would coordinate with the Gowanus Canal Conservancy with respect to the native plant nursery in advance of construction activities. Therefore, construction of the Project would not result in significant adverse impact to ecological communities.

Operation

The Head End Facility would include the development of some type of publicly accessible vegetated open space or waterfront access as Part of the Project, thus resulting in more vegetated habitat within the study area. Any required replacement and/or restitution would be provided in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York. As part of the design process DEP would evaluate the feasibility of the Gowanus Canal Conservancy's post-construction use of the Owls Head Site for their native plant nursery and other community programs. If feasible, this post-construction use would be incorporated into the design of the Owls Head Facility. Therefore, operation of the Project would not result in significant adverse impacts to ecological communities.

WILDLIFE

Construction

As discussed under "Existing Conditions," the study area is limited to previously disturbed City streets and building exteriors that provide habitat to only the most disturbance-tolerant wildlife species. Construction of the Project would likely result in the temporary displacement of wildlife, however, similar habitat is available in the vicinity of the study area and the temporary disturbance of individuals of urban tolerant species would not result in significant adverse impacts to wildlife resources. Therefore, construction of the Project would not result in significant adverse impacts to wildlife.

Operation

The surface areas on the sites are expected to be paved and accessible for maintenance and operations, with landscaping where appropriate. This landscaping would provide forage for pollinators, and higher quality habitat for other species. Therefore, operation of the Project would not result in significant adverse impacts to wildlife.

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES

Construction

As discussed under "Existing Conditions," federally listed species that were identified as potentially within the study area are not expected to be present due to the lack of suitable habitat. Therefore, construction of the Project would not result in significant adverse impacts to threatened, endangered, and special concern species.

Operation

Maintenance and operation of landscaping would not change the lack of suitable habitat for federally listed species; thus, federally listed species are not expected to be present within the study area. Therefore, operation of the Project would not result in significant adverse impacts to threatened, endangered, and special concern species.

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Chapter 10: Hazardous Materials

A. INTRODUCTION

This chapter assesses the potential for the presence of hazardous materials in the project area, the potential for exposure to hazardous materials during and following construction, and the specific measures that would be employed to protect public health, worker safety, and the environment. A "hazardous material" is generally defined as any substance that poses a threat to human health or the environment. It is often used interchangeably with "contaminated material," but should not be confused with the term "hazardous waste," which is a regulatory term.[1]

The project area has a long history of commercial/industrial uses. Based on the area's history, subsurface contaminants would be expected to include those related to petroleum, manufactured gas plants (MGPs) that were historically located on portions of the project sites and nearby, as well as other subsurface contamination (in the fill, soil, and/or groundwater). Any required demolition of or disturbance to existing buildings could entail addressing any asbestos containing materials (ACM), lead-based paint (LBP) or other hazardous materials that might be present.

The Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) would result in the construction and operation of CSO facilities at two sites along the Gowanus Canal (the Canal). This chapter addresses hazardous materials concerns related to the Project, including the potential presence of subsurface hazardous materials (in the fill, soil and/or groundwater) that would be disturbed during construction (also summarized in Chapter 20, "Construction").

Construction of the Head End Facility is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1). Construction of the Owls Head Facility is proposed to be located at 2 2nd Avenue (Block 977, Lot 3), 110 5th Street (Block 990, Lot 21), 122 5th Street (Block 990, Lot 16), 22 2nd Avenue (Block 990, Lot 1), and 5th Street (Block 977, Lot 1), with portions of this area used for construction staging.

Both the Head End Site and Owls Head Site (the Project Sites) have a long history of commercial/industrial uses, with which subsurface contamination (in the fill, soil, and/or groundwater) is frequently associated. The Head End Site is located within the boundaries of the former Fulton Municipal Works MGP site which continues to be investigated and remediated by National Grid pursuant to Administrative Orders with the New York State Department of Environmental Conservation (NYSDEC) and U.S. Environmental Protection Agency (USEPA). The Site encompasses Parcels VI (242 Nevins Street; Block 418, Lot 1) and Parcel VII (234 Butler Street, Block 411, Lot 24) of the former Fulton MGP site and has been the subject of prior investigations, as described below (see **Figures 10-1 and 10-2**). The NYSDEC issued a Record of Decision (NYSDEC ROD) for the former Fulton MGP site in July 2015 that specifies the remediation to be

[1] "Hazardous waste" is defined in both the Environmental Protection Agency (USEPA) regulations (40 CFR Part 261) and New York State regulations (6 NYCRR Part 371) and refers to a subset of solid wastes that are either specific wastes listed in the regulations (listed wastes) or solid wastes possessing the characteristic of ignitability, reactivity, corrosivity, or toxicity (characteristic wastes).

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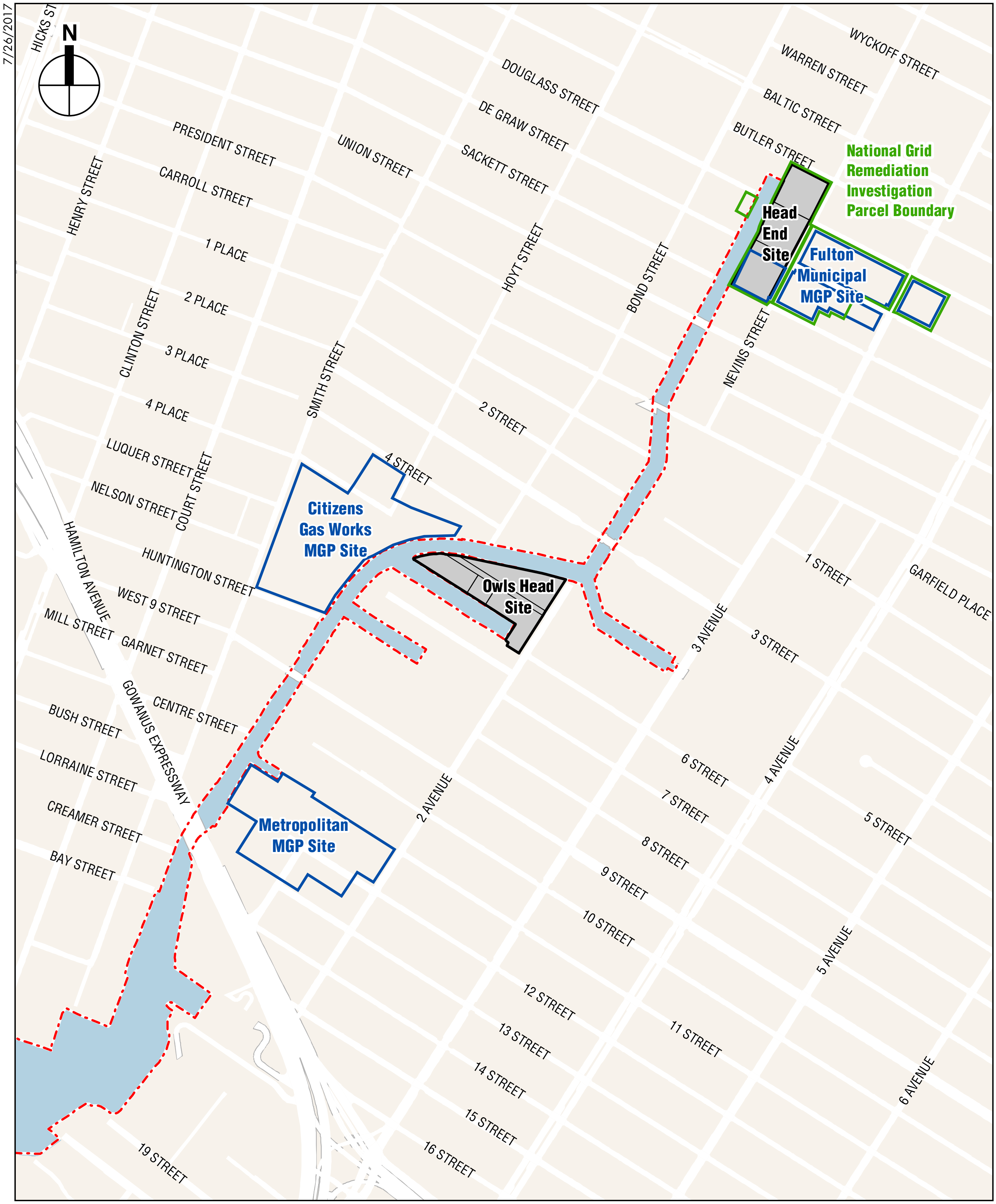

Project Sites | *Former MGP Sites (Approximate)*

Gowanus Canal | *National Grid Remediation Investigation Parcel Boundary*

0 — 1,000 FEET

Gowanus Canal CSO Facilities

Upland Sources of Contamination

Figure 10-1

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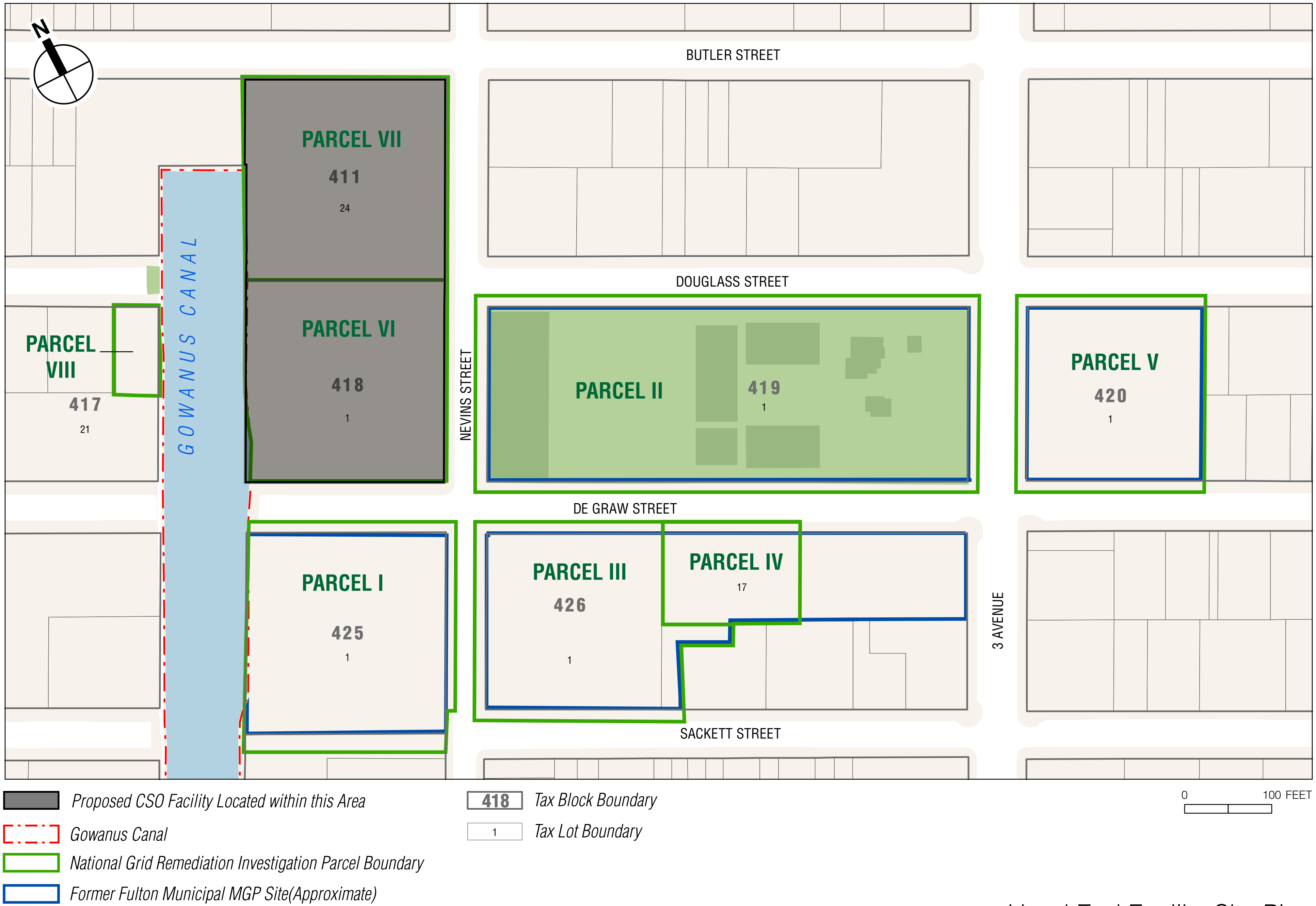

Gowanus Canal CSO Facilities

Head End Facility Site Plan

Figure 10-2

performed by National Grid. The Head End Site also includes a construction staging area on Parcel I of the former Fulton MGP site (270 Nevins Street, Block 425, Lot 1) that will be used during the construction of the CSO Facility.

The Owls Head Site ~~has~~ had not been the subject of any formal environmental investigations prior to the 2017 Pre-Design Investigation (PDI) and, though it did not historically include MGP facilities, may also have subsurface contamination associated with the former Citizen’s Gas Works MGP facility located across the Canal and/or contamination from other sources (see **Figure 10-3**).

Additionally, disturbance to or demolition of the existing buildings at the Project Sites would entail addressing any ACM, LBP, or other hazardous materials that would be disturbed, e.g., asbestos pipe insulation, polychlorinated biphenyls (PCBs) in caulk or electrical equipment, or mercury-containing switches.

Before preparing the designs for the CSO Facilities, the New York City Department of Environmental Protection (DEP)~~is conducting~~ conducted and/or will conduct further pre-demolition surveys, pre-design investigations and treatability studies to inform and guide the design by characterizing the environmental conditions at both sites and evaluating options for treatment and disposal of the materials associated with demolition of structures, the soil and fill material to be excavated and the groundwater to be managed during construction. The pre-demolition surveys are being conducted pursuant to a Pre-Demolition Survey (PDS) Work Plan outlining the structures to potentially be demolished, the types of hazardous materials that may be present, and the sampling and analysis to be performed. The pre-design investigations ~~are being~~ were conducted per ~~a Pre-Design Investigation (~~PDI~~)~~ Work Plans outlining the areas of the sites targeted for additional investigation, identifying the sampling required, and specifying the data to be gathered as part of the PDI. A Treatability Study Work Plan has been prepared describing the treatability testing that will inform the design for the material handling and treatment requirements for the soils and groundwater to be managed at the sites. ~~Field work is ongoing and the currently available~~The site characterization data are presented below under “Existing Conditions.”

This chapter addresses potential environmental concerns related to hazardous materials, both during and following implementation of the Project.

B. REGULATORY CONTEXT

A hazardous material is any substance that poses a threat to human health or the environment. Substances that may be of concern in the subsurface include coal tar (a byproduct of the historical MGPs), heavy metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and pesticides. ACM and LBP are the most common aboveground (e.g., on or within building materials) hazardous materials. Management of the various types of hazardous materials is subject to numerous regulatory programs, including those of the USEPA, the NYSDEC, and the New York City Department of Environmental Protection (DEP).

Historically, the project areas were within the Gowanus Creek (a tidal estuary) which was channelized and filled in the mid-19th Century to create the Gowanus Canal. The source of this fill material is unknown. Following its construction, the Canal quickly became one of the nation’s busiest industrial waterways, serving heavy industries in the area that included coal yards, cement manufacturing, tanneries, paint and ink factories, machine shops, chemical plants, oil refineries, and three MGPs. On March 2, 2010, the Canal was designated a federal Superfund site under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and placed on the National Priorities List (NPL). The main goal of the CERCLA process is to remediate constituents of concern (i.e., hazardous materials or contaminants) in the Canal sediments that were deposited over the Canal’s long industrial history. On September 27, 2013,

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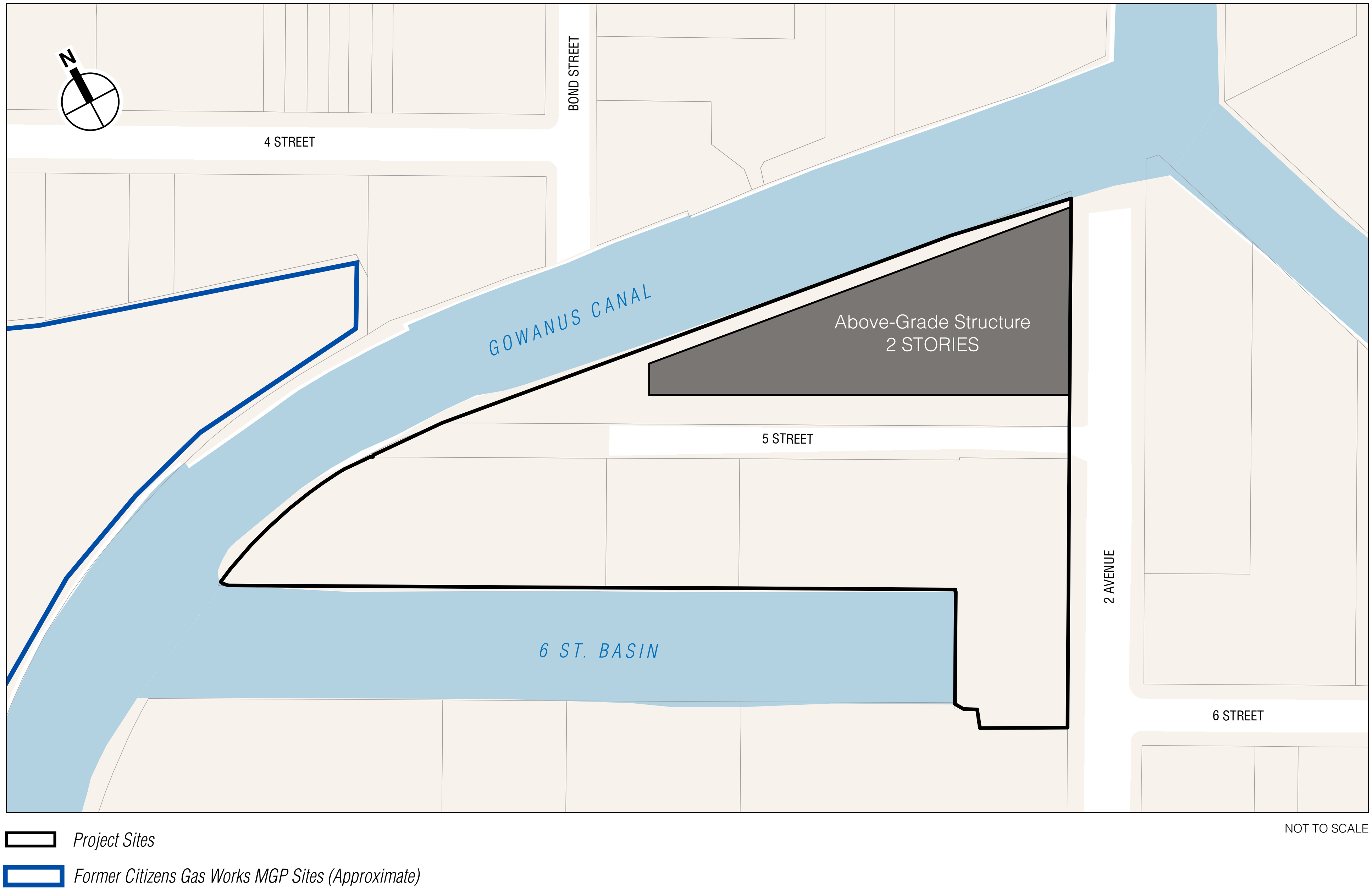

Owls Head Facility Site Plan

Figure 10-3

the USEPA issued a Record of Decision (USEPA ROD) identifying actions to be undertaken by various parties to remediate contamination in the Canal, including remediation of industrial contamination within the Canal, and the construction of the Gowanus Canal CSO Facilities.

Independent of the Project, the July 2015 NYSDEC ROD issued by NYSDEC for the former Fulton MGP site, specifies the remediation to be performed by National Grid at the Head End Site (which is a portion of the larger MGP site). Additional clean-up activities in the vicinity of the Canal, including the installation of bulkheads (which function as containment/cutoff walls) and the excavation or stabilization of much of the contamination, will be conducted by National Grid. The July 2015 NYSDEC ROD also specifies remedial measures known as engineering controls (ECs) and institutional controls (ICs) to protect workers and the public from potential exposure to hazardous materials that remain in the subsurface under current and future uses of the site. These measures include inspection and maintenance of existing surface covers (and installation of new surface covers where necessary), restrictions on certain activities and uses of the properties, and implementation of site management plans to ensure that any excavations or subsurface disturbances are performed in a safe and protective manner by qualified professionals and that the surface cover is properly restored. Pursuant to a May 2017 Administrative Order with USEPA, National Grid is currently designing a bulkhead barrier wall and may be required to design a permanent groundwater management system at Parcels I, VI and VII of the former Fulton MGP site under USEPA oversight.[2]

To the extent that residual contamination would need to be addressed by DEP as part of the Project beyond the remediation activities being conducted by National Grid, a response action would be conducted at Parcels VI and VII for the excavation of contaminated material and soil associated with construction of the CSO Facility, including the design and operation of any temporary groundwater treatment and/or management system, per the June 9, 2016 Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery (Settlement Agreement), issued by the USEPA.[3] Additional subsurface investigations ~~are being~~were performed in coordination with USEPA, NYSDEC, and National Grid to further characterize the soil and groundwater conditions to ensure that the design and construction of the Project would properly address the full extent of hazardous materials conditions at the site. The site characterization data are presented below under “Existing Conditions.”~~.~~

Similarly, prior to construction at the Owls Head Site, where MGP-related contamination or other hazardous materials may also be present, further investigation ~~is being~~was performed by DEP, in coordination with USEPA~~ and potentially NYSDEC~~, to characterize and properly address the ~~full extent of~~ hazardous materials conditions at this site. The site characterization data are presented below under “Existing Conditions.”

C. METHODOLOGY

This assessment follows the methodology in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*. For hazardous materials, the goal for CEQR is to determine whether a proposed project may increase the exposure of people or the environment to hazardous materials, and, if so, whether this increased exposure would result in potential significant public health or environmental effects. If adverse

2 “Contaminated groundwater that is migrating to the canal from upland areas will be investigated and addressed as part of the upland source remediation, as necessary.” USEPA 2013 ROD, Page 86

3 USEPA. “Administrative Settlement Agreement and Order for Remedial Design, Removal Action, and Cost Recovery,” June 2016, USEPA Region II, New York, NY.

effects are identified, CEQR requires that the effects be disclosed and mitigated or avoided to the greatest extent practicable.

For the Head End Site, which is adjacent to the Canal, existing reports (NYSDEC 2007, CH2MHill 2011, HDR 2011, GEI 2012, National Grid 2013 and 2015, GHD 2015) encompassing subsurface conditions, historical uses, and known regulatory issues were reviewed to determine current conditions. Although the Owls Head Site is also adjacent to the Canal, these reports did not contain data specific to the Owls Head Site, as it did not have historical manufactured gas plant usage. These reports did include data on properties surrounding/nearby both Sites, though the study area varied for different types of data, with search distances (e.g., 1 mile for Federal Superfund sites and ⅛ mile for New York State Petroleum Bulk Storage facilities) for the historical/regulatory information per ASTM E1527-13, the standard methodology for performing Phase I Environmental Site Assessments.

All appropriate measures, such as proper management of excavated soil; appropriate dust, vapor and runoff controls; and health and safety procedures, to avoid potential adverse environmental impacts from hazardous materials during the construction and subsequent operation of the Project are addressed and summarized below.

D. POTENTIAL CONTAMINANTS OF CONCERN

Soil and groundwater can become contaminated as a result of past or current activities on a project site or as a result of migration of contaminants from such activities in nearby areas. Many industrial activities use, store, or generate contaminated materials that can be spilled, dumped, or buried nearby. Other activities common in mixed-use neighborhoods, such as gas stations and auto repair shops, can also result in contamination due to improper handling/management of raw product and/or waste materials, or inadvertent spills/release.

Of particular concern for the project area are MGPs. These plants existed from the 1800s to the mid-1900s, before the construction of natural gas pipelines, and converted coal or a combination of coke or coal, oil and water in the form of steam into a gas that could be distributed and used as a fuel for heating, cooking, and lighting. Byproducts of the gas production, such as coal tar (wastes containing VOCs, SVOCs and inorganic chemicals) may pose a threat to human health and the environment. National Grid has investigated its former MGP sites in the Gowanus Canal watershed to characterize and delineate the nature and extent of contamination from these historic facilities, and where found necessary by NYSDEC to protect human health or the environment, will be required to remediate areas of residual contamination from these facilities.

Exposure to contaminants from MGP or other sources of contaminants can potentially occur through direct contact. Exposure to contaminated groundwater through ingestion is not expected as Brooklyn is served by municipal water systems that rely on upstate reservoirs. However, if such contaminants are not properly managed, the proposed excavation, dewatering, and other construction activities can introduce potential risk to construction workers and others nearby by providing a pathway of exposure to contaminants. Demolition or disturbance of existing buildings that have ACM, LBP, electrical equipment containing PCBs or other hazardous materials has the potential to release contaminants to the soil, water or air if these materials are not properly managed.

Based on the types of contaminants that are typically found in New York City, some of the potential contaminants of concern are described below. The list provides a summary of potential categories of contaminants and is not a comprehensive list of all contaminants that may be encountered:

1. **Volatile organic compounds (VOCs)**: These include aromatic compounds—such as benzene, toluene, ethylbenzene, xylene (BTEX), which are found in MGP wastes and petroleum products

(especially gasoline, which can also contain methyl tertiary butyl ether [MTBE])—and chlorinated compounds, such as tetrachloroethene (also known as perchloroethylene or "perc") and tricholoroethene, which are common ingredients in solvents, degreasers, and cleansers. VOCs represent the greatest potential for exposure since, in addition to soil and groundwater contamination, they can generate organic vapors.

2. **Semi-volatile organic compounds (SVOCs)**: The most common SVOCs in urban areas are polycyclic aromatic hydrocarbons (PAHs), which are constituents of partially combusted coal- or petroleum-derived products, such as MGP wastes, coal ash, and fuel oil. PAHs are commonly found in New York City urban fill material, which likely underlies all of the project area. Petroleum-related SVOCs could be present and are typically associated with buried tanks currently or formerly located in the project area. SVOCs can also be present in creosote-treated timber (e.g., piles from former bulkheads or piers).
3. **Polychlorinated biphenyls (PCBs)**: Commonly used as a dielectric fluid in transformers, some underground high-voltage electric pipelines, and hydraulically operated machinery, PCBs are of special concern near electrical transformers where leakage into soil may have occurred. PCBs and/or PCB-containing materials were once widely used in manufacturing and industrial applications (e.g., hydraulic lifts, transformers, and plastics manufacturing). PCBs tend to travel only short distances in soil, except in unusual circumstances (e.g., large spills of PCB-containing oils over many years).
4. **Pesticides, herbicides, and rodenticides**: These are commonly used to control rodents and/or insects and vegetation in vacant structures or in vegetated areas, including parks. Pesticides/herbicides are relatively immobile and tend to be persistent in surface soils.
5. **Metals (including lead, arsenic, cadmium, chromium, mercury and cyanide)**: Metals are often used in smelters, foundries, and metal works and are found as components in MGP wastes, paint, ink, petroleum products, and coal ash, and were used in the past (copper, chromium and arsenic) as wood preservatives (e.g., on piles). These metals tend not to migrate far in soil; therefore, they typically would be of greater concern at the site where they were generated than at off-site areas. Metals at levels above natural background levels are frequently present in fill material throughout the New York metropolitan area.
6. **Fuel oil and gasoline from storage tanks**: Numerous residences and businesses upland of (or less likely in) the project area could have had above-ground storage tanks and/or underground storage tanks for fuels, including heating oil and gasoline. Some of the MGP facilities stored large volumes of oil. Although the MGP-related tanks have been removed, underground storage tanks at other locations, although no longer in use, may remain buried in place. Some of the tanks are known to have leaked, and others have possibly leaked despite no record of a spill reported. Some spills have been cleaned up in accordance with state regulations, but others have not because they have not yet been discovered or because cleanup, which can take several years, is ongoing.
7. **Fill materials of unknown origin**: In the past, waste materials, including coal and incinerator ash, demolition debris, and industrial wastes, were commonly used as fill in urban areas. Even fill material consisting primarily of soil may exhibit elevated levels of PAHs, metals, PCBs, SVOCs, and other contaminants. Such materials are potentially present throughout the project area.
8. **Asbestos**: Asbestos is a common component of building materials, especially insulation, fireproofing, tile flooring, plaster, sheetrock, ceiling tiles, mastic, and roofing materials. In addition to materials within existing structures, subsurface utility lines may be coated with asbestos or encased in "transite," an ACM. Asbestos was widely used before 1980. Because of the age of many of the buildings and bridges in the project area, ACMs are almost certainly present.
9. **Lead-based paint (LBP)**: The use of LBP (paint with more than 0.5% lead) in New York City residential buildings was banned in 1960. Its use in other buildings and outdoors was severely

restricted by the Consumer Products Safety Commission in 1977. Lead-containing paint (paint with any level of lead or LCP) is regulated under the OSHA Lead Exposure in Construction standard (29 CFR 1926.62). Lead that is released as dust (or as a fume if heated) is potentially hazardous, especially to children. Older buildings and other painted structures or elements are likely to include LBP or LCP.

E. EXISTING CONDITIONS

In the early 19th century, the site where the Gowanus Canal is now located was occupied by the Gowanus Creek, local tributaries, and lowland marshes. The surrounding lowland marshes were filled with material of unknown origin in order to construct the Canal.

HEAD END SITE

The Head End Site is generally flat with a gentle drop in elevation from east to west towards the Canal. Fill was noted to as much as 27 feet below grade, but typically extended between 7 and 8 feet below grade, and groundwater was first encountered at between 4 and 14 feet below grade (GEI 2012).

As discussed above, the Head End Site is located within three of National Grid's Remedial Investigation Parcels of the former Fulton MGP Site (also known as the Fulton Municipal Works), identified as: Parcel VI - 242 Nevins Street (Block 418, Lot 1); Parcel VII - 234 Butler Street (Block 411, Lot 24); and Parcel I - 270 Nevins Street (Block 425, Lot 1), which would be used for construction staging (see **Figure 10-2**). Parcel I was one of the properties occupied by the former Fulton MGP Site, while Parcels VI and VII represented off-site areas of investigation.

The Fulton MGP operated from approximately 1879 until 1929[4] and produced gas from coal, oil, and other feedstocks. The gas was stored in large holders (partially underground) and piped to the surrounding area, where it was used for lighting, cooking, and heating by homes and businesses. These operations led to extensive contamination of soil and groundwater by coal tar and other contaminants, primarily at the Fulton MGP Site itself, but also in the vicinity. Historical maps of the Fulton MGP show coal yards and structures associated with MGP operations on the Head End Site. Notable structures included circular tanks labeled as hydrogen and oil tanks, and rectangular tanks labeled as gas oil tanks. Although the aboveground structures have been removed, it is common for residual former MGP structures, such as foundations, pilings, or demolition debris, to remain in the subsurface.

National Grid is the successor company to the original owners/operators of the Fulton MGP. In 2007 NYSDEC issued an administrative consent order (ACO) and administrative settlement #A2-0552-0606 with National Grid's predecessors (Brooklyn Union Gas/Keyspan) to evaluate environmental conditions at a number of sites in New York City and Long Island, New York, including the Fulton MGP (i.e., including the parcels at the Head End Site).[5]

REMEDIAL INVESTIGATION—2012

National Grid's 2012 Remedial Investigation (GEI 2012) (and subsequent Interim Remedial Measures and Remedial Design process) have focused on two separate but related concerns: soil and groundwater

[4] More information about the Fulton Municipal Works site can be found at http://www.fultonmgpsite.com.

[5] See http://williamsburgmgpsite.com/pdfs/A2-0552-0606%20Muli-Site%20Order.pdf for the Order on Consent.

contamination with coal tar and other MGP-related compounds; and contaminated sediments in the Gowanus Canal (including MGP waste that discharges to the Canal).

Where the CSO Facility would be constructed, within Parcels VI and VII (Parcel I would only be used for construction staging), sampling at 6 of the 10 locations (including all the locations within Parcel VI) identified MGP-related coal tar and petroleum in the subsurface at depths ranging from the surface to approximately 112 feet below grade. Coal tar was observed as a dense non-aqueous phase liquid (DNAPL) at various depths, and was noted to be migrating in a downward and lateral direction towards the Canal.

The soils within Parcels VI and VII identified the presence of VOCs (notable including benzene, which is a constituent of coal tar); SVOCs (including naphthalene, another constituent of coal tar), and metals (including lead) exceeding the NYSDEC Unrestricted Soil Cleanup Objectives (6 NYCRR Part 375), with the exception of SVOCs attributed to the observed historical fill material including Benzo(a)pyrene and benzo(k)fluoranthene, which exceeded the Commercial Soil Cleanup Objective (6 NYCRR Part 375).

The groundwater within Parcels VI and VII identified the presence of VOCs (notably benzene), SVOCs (including naphthalene), pesticides, and metals (including lead) that exceeded the NYSDEC Ambient Water Quality Standards (6 NYCRR Parts 700-706).

PREDESIGN INVESTIGATION—2017

A 2017 ~~predesign investigation (~~PDI~~)~~ (Hazen/Brown and Caldwell 2017, Pre-Design Investigation Report – RH-3) was conducted to further characterize the ~~full extent of~~ hazardous materials conditions at the Head End Site. The PDI included collection and analysis of soil, groundwater and soil vapor samples at locations within the footprint of the CSO Facility and at locations adjacent to the CSO Facility footprint within Parcels VI and VII. ~~The investigation at Parcel VII has not yet been completed due to access restrictions.~~

The PDI findings are generally consistent with the prior investigations at the former Fulton MGP Site. Within Parcel VI, coal tar contamination was observed in the majority of the soil samples at depths ranging from approximately 6 to 150 feet below grade. The soil samples within Parcel VI identified the presence of VOCs (notable including benzene); SVOCs (including naphthalene)~~,~~ and metals (including lead) exceeding the NYSDEC Commercial Soil Cleanup Objectives (6 NYCRR Part 375). Lead was also identified exceeding the USEPA Resource Conservation and Recovery Act (RCRA) limit for hazardous waste in one soil sample. In the absence of a likely source for this lead, it is most likely to be related to historical fill material or building debris. The groundwater samples identified the presence of VOCs (including benzene), SVOCs (including naphthalene) and metals (including lead) exceeding the NYSDEC Ambient Water Quality Standards (6 NYCRR Parts 700-706). Soil vapor samples were also collected and the results detected VOCs, notably benzene (there are no New York State soil vapor guidance levels). ~~Sampling was performed at one location within Parcel VII~~

Within Parcel VII, coal tar contamination was observed in the soil samples at one location at depths from approximately 66 to at least 75 feet below grade. The soil samples within Parcel VII identified the only exceedances of the NYSDEC Commercial Soil Cleanup Objectives (6 NYCRR Part 375) to be for SVOCs. The groundwater samples identified the presence of VOCs (including benzene) and metals (including arsenic) exceeding the NYSDEC Ambient Water Quality Standards (6 NYCRR Parts 700-706). Soil vapor samples were also collected and the results detected VOCs, notably benzene (there are no New York State soil vapor guidance levels). ~~the remaining samples will be collected when access is granted and the report will be prepared before the Final EIS.~~

OWLS HEAD SITE

The Owls Head Site has an industrial history similar to most of the properties along the Canal, having been used for public warehousing and coal storage, did not historically include former MGP facilities.

SUBSURFACE INVESTIGATION—2015

A 2015 subsurface investigation ~~report~~ (GHD 2015) consisting of 10 shallow (three to six feet below grade) composite soil samples collected from individual borings, did not identify coal tar but confirmed the presence of SVOCs, metals, PCBs, and pesticides in the shallow soil, which was attributed to the observed historical fill material and was not likely indicative of a spill or a release.

PREDESIGN INVESTIGATION—2017

A 2017 PDI ~~is being~~was conducted by DEP to characterize the full extent of hazardous materials conditions at this site (Hazen/Brown and Caldwell 2017, Pre-Design Investigation Report for OH-007). The PDI include~~s~~d collection and analysis of soil, groundwater and soil vapor samples. Coal tar contamination was observed in the majority of soil samples at depths ranging from approximately 30 to ~~35~~ 40 feet and in ~~one~~ three borings ~~at 57~~ up to approximately ~~59~~60 feet, which is within the sand below the fill material and meadow mat. ~~Laboratory test results are not yet available.~~ The soil samples identified the presence of SVOCs (including naphthalene) and metals (including lead) exceeding the NYSDEC Commercial Soil Cleanup Objectives (6 NYCRR Part 375). Lead was also identified exceeding the USEPA RCRA limit for hazardous waste in one soil sample. In the absence of a likely source for this lead, it is most likely to be related to historical fill material or building debris. The groundwater samples identified the presence of VOCs (including benzene), SVOCs (including naphthalene), and metals (including lead) exceeding the NYSDEC Ambient Water Quality Standards (6 NYCRR Parts 700-706). Soil vapor samples were also collected and the results detected VOCs, notably benzene (there are no New York State soil vapor guidance levels).

F. FUTURE CONDITIONS IN THE ANALYSIS YEAR

As described in Chapter 1, “Project Description,” the Project is part of the federally required Superfund remediation of the Canal, mandated by USEPA. Independent of the Project, the required remediation for the Head End Site would be conducted by National Grid pursuant to administrative orders under the jurisdiction of NYSDEC and in coordination with the remediation required under CERCLA by USEPA. NYSDEC’s ROD issued in 2015 requires National Grid to construct a bulkhead along the east bank of the Canal, install coal tar extraction wells, excavate or stabilize the MGP-related contamination, and implement engineering and institutional controls to protect workers and the public from potential exposure to hazardous materials remaining in the subsurface. On May 11, 2017, USEPA issued an Administrative Order to National Grid that specifies additional requirements for the design and construction of the bulkhead and a permanent groundwater management system.

In addition, the bulkhead at the Owls Head Site would be stabilized or replaced prior to any in-water remediation activities conducted by National Grid in the Canal. Investigations would be performed to characterize the geotechnical and environmental conditions prior to design of a new bulkhead.

G. PROBABLE IMPACTS OF THE PROJECT

CONSTRUCTION PHASE

Construction of the Project would be divided into three construction phases (CP-1, CP-2, and CP-3). CP-1 includes site preparation, utility relocation, and demolition. CP-2 includes the support of excavation (SOE) construction, site excavation, and construction of the below-grade structures. CP-3 includes the construction of the above grade structures, conveyances, and outfalls. The construction staging area for the Head End Site would be cleared with only the concrete foundation slab remaining to support Project construction.

DEMOLITION

Demolition of existing above-grade structures would be required. This work, at a minimum, would conform to the following regulatory requirements (additional requirements may be incorporated into the project specifications):

- Prior to any demolition activities with the potential to disturb (aboveground or underground) petroleum storage tanks, these tanks would be closed and removed, along with any contaminated soil, in accordance with applicable requirements and guidelines including NYSDEC spill reporting and tank registration requirements. If tanks are unexpectedly discovered, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage registrations would be kept updated with the status of the tanks.
- Unless information exists to indicate that suspect ACM do not contain asbestos, prior to any demolition activities an asbestos survey would be completed by a qualified individual/contractor, and all ACM that would be disturbed by the demolition activities would be removed and disposed of in accordance with local, state, and federal regulations and guidelines.
- Any demolition activities with the potential to disturb positively identified or suspected LBP/LCP would be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62—Lead Exposure in Construction).
- Unless labeling or laboratory testing data indicates that suspected PCB-containing fluorescent lighting fixtures, transformers, other electrical equipment, lifts, and elevators do not contain PCBs, and that fluorescent lights do not contain mercury, disposal would be performed in accordance with applicable federal, state, and local regulations and guidelines.
- Disposal of any hazardous materials or hazardous wastes would be in accordance with applicable regulations and guidelines.

SUBSURFACE DISTURBANCE

At the Head End Site, after demolition under the CP-1 construction phase and prior to the CP-2 site excavation and construction of the below-grade structures, National Grid (as required by NYSDEC and USEPA) would undertake its site remediation activities at the Head End Site, which would include constructing a bulkhead, installing coal tar extraction wells, and excavating or stabilizing MGP-related contamination outside the footprint of the CSO Facility. The remediation and construction work being conducted by National Grid would be coordinated with the construction of the Project. NYSDEC indicated that further remediation and monitoring may also be required.

Construction of the Project under the CP-2 construction phase would require extensive excavation for tanks and conveyance piping at both Project Sites.

The Head End Facility would include an 8-million-gallon (MG) underground tank with a depth ranging from approximately 27 to 36 feet below grade (with some excavation in certain areas as deep as 60 feet). Excavation of approximately 122,000 to 172,000 cubic yards (CY) of soil is anticipated to be required for the tank and ~~support of excavation (~~SOE~~)~~. Although National Grid will complete their remediation work at the Head End Site to address MGP-related contamination prior to commencement of construction for the CSO Facilities Project, for the SOE and excavation for the below-grade tank, it is anticipated that construction of the CSO Facility, on the portion of the Head End Site not used for construction staging, would require removal of additional soil (including soil containing coal tar and potentially petroleum) and treatment of groundwater (containing benzene and other contaminants) removed by dewatering. The RH-034 Staging Area Property would not require excavation as part of the Project and therefore, the Project would not result in additional in-ground disturbance in this area.

The Owls Head Facility would include a 4-MG underground tank with a depth ranging from approximately 30 and 39 feet below grade (with some excavation in certain areas as deep as 55 feet). Excavation of approximately 56,000 to 68,000 CY of soil is anticipated to be required for the tank and ~~support of excavation (~~SOE~~)~~.

Based on the existing studies discussed above at both Project Sites, shallow subsurface soil contamination is known to be present in certain areas (and possibly present in other locations not yet tested), but is less significant and less of a concern than the contamination below the water table, especially that related to former MGPs. However, the entire project area consists of fill material of unknown origin even in areas not contaminated by wastes from historical MGPs or petroleum spills. Although testing did not indicate widespread significant contamination of this fill, localized areas with elevated contamination were found and may be present in other locations not yet tested. Project-related excavation would disturb these soils and potentially increase pathways for human or environmental exposure.

As discussed above, as a part of preparing the facility design, DEP has conducted or is conducting additional investigation and treatability studies, for both the Head End and Owls Head Sites, to inform and guide the design by characterizing the environmental conditions at the sites and evaluating options for treatment and disposal of the soil and material to be excavated and the groundwater to be managed during construction. Any ~~coal tar~~MGP-related or other contamination that is within the limits of excavation for the CSO Facilities will be properly managed during construction. Any coal tar contamination remaining at the sites after construction of the CSO Facilities would be addressed in coordination with the USEPA and NYSDEC.

The CP-2 subsurface construction/remediation work conducted on the Head End Site for the construction of the CSO Facility would, per the Settlement Agreement between USEPA and the City, be conducted as a Removal Action. DEP would prepare a Plan for USEPA approval setting out the procedures to be followed during the CP-2 construction phase of the Project. The procedures that may be included in the Plan are summarized below.

Soil Removal

Portions of the soil to be excavated ~~soil~~ are ~~anticipated to be~~ impacted by MGP residuals. Soils containing MGP residuals or other contamination would be transported to a licensed and USEPA-approved off-site facility for treatment or disposal. Wet soils (from below the water table) would typically be treated (by mixing with drying agents) to stabilize free liquid before being transported offsite for treatment or disposal. Soils containing high levels of MGP residuals would be treated in off-site thermal desorption units (large, enclosed reactors). In this process the soil is heated to volatilize the VOCs and SVOCs into the gaseous phase, which then is further treated to destroy or otherwise remove the contaminants. The treated soil may be reused as landfill daily cover or fill material, if levels of non-volatile contaminants are below established limits, or disposed in a non-hazardous waste landfill. Soils with lower levels of MGP residuals and/or other hazardous materials, which do not exhibit any of the characteristics of hazardous waste, ~~would~~may also be treated via off-site thermal desorption or ~~be~~ disposed of in a non-hazardous waste landfill. Although it is not expected (based on the available data) that the soil would ~~exhibit a characteristic of~~be classified as a hazardous waste, contingencies would be in place to manage such soils either by treating them to eliminate the characteristic (e.g., mixing the soil with cement or other material to stabilize the contaminants) or disposing of them at a licensed and USEPA-approved hazardous waste treatment/disposal facility. In all cases, there are strict regulatory requirements governing the transportation and treatment/disposal of these soils and facility-specific permits (issued by NYSDEC or the equivalent for treatment/disposal facilities in other states) that set out detailed acceptance criteria. Additionally, USEPA must approve of any offsite treatment and disposal facilities for the Project pursuant to CERCLA requirements. Additional testing would need to be performed, as part of a Waste Characterization Plan that would be developed as a part of the Final Design, to determine compliance with disposal facility criteria.

Properly managed, the deep excavations and dewatering required for construction of the tanks ultimately would have beneficial effects related to hazardous materials, as these activities would remove contamination from the sites to a greater extent than would likely occur with only National Grid's cleanup of the Head End Site; NYSDEC does not typically require such deep excavation for cleanup, even if deep contamination is present.

However, without proper controls, subsurface construction activities could result in unacceptable exposures to hazardous materials by construction workers, the general public and/or the environment. To avoid such exposures, the measures summarized below would be incorporated into the Project (final requirements would be specified by the designers and included in the bid documents) to reduce the potential for significant adverse impacts during Project construction and implementation.

- ~~Prior to construction, further investigation of both sites would be performed by DEP to better determine the nature of the soils that would be excavated during construction in order to prescribe appropriate procedures (and treatment or disposal facilities) for management and handling of these soils during construction, protect the health of the general public and project construction workers, and to reduce the potential for significant adverse impacts.~~
- Investigations of both sites were performed by DEP to better determine the nature of the soils that would be excavated during construction. Based on the results of the~~se additional~~ investigations ~~and the other investigations~~ that have ~~already~~ been completed and any additional investigations, if determined to be necessary, appropriate measures will be developed for protection of workers, the general public and the environment and included in the Remedial Design Reports prepared for the Head End and the Owls Head Sites. As noted above, procedures for this work and for the treatment of any contaminated groundwater removed during dewatering would be subject to NYSDEC, DEP and/or USEPA approval.
- Due to known MGP contamination at the Head End Site and ~~possible MGP contamination at~~ the Owls Head Site, the procedures would generally be more stringent than would be typically required at construction sites with no MGP-related contamination. For both the Head End and the Owls Head Sites, the various construction documents would address management of soil and groundwater, including procedures for:
  - **Health and safety measures** to protect workers and the surrounding community. These measures would ensure that all soil disturbance is performed in a manner protective of project construction workers, the general public, and the environment, and would include procedures for odor, dust, and nuisance control, as well as air monitoring requirements.
  - **Soil screening** during excavation. Visual, olfactory, and instrument-based soil screening would be performed under the supervision of a Qualified Environmental Professional during construction

that involves subsurface disturbance. Soils will be segregated (based on screening results, existing environmental data, and additional data such as waste characterization data) into material intended for off-site treatment or disposal, material intended for re-use as backfill material (if needed), and material that requires further sampling and testing to determine its fate.

- **Construction-related dewatering**. Testing to date indicates that at both Project Sites water collected from dewatering activities would require treatment prior to discharge, particularly given the MGP contamination~~ at the Head End Site and the potential for MGP contamination at the Owls Head Site~~. At both Project Sites a temporary groundwater treatment system would be designed to treat water generated during construction from excavation dewatering; drainage of excavated materials; contact stormwater runoff; decontamination of construction vehicles, equipment and tools; and other minor sources. Based on available data, influent water could contain a wide range of constituents including: oil and grease, VOCs, SVOCs, pesticides and metals; and NAPL from the former MGP operations which could be encountered in the groundwater. Treatment processes would likely include some of all of the following steps: (1) tanks for equalization, sedimentation and removal of free product: metals removal and air stripping using chemical addition for pH adjustment, coagulation and flocculation, and either a settler/clarifier, packaged bag filters, and tray stripper system or a venturi stripping system, sludge tank, and bag filters; (2) granular activated carbon for removal of organic compounds and metals; (3) contingent ion exchange for low level metals removal; (4) sludge dewatering (holding tank, polymer feed system and geotube or filter press); and (5) vapor-phase granular activated carbon or biofilter for air stripper off-gas. Solids generated from treatment would be disposed off-site or regenerated for reuse within the treatment system (e.g., activated carbon). It is anticipated that treated effluent from the temporary treatment system would be discharged directly to the Canal or to the sanitary sewer system. Dewatering would be conducted in accordance with applicable permitting requirements. Treatment limits would be established by NYSDEC, DEP and/or USEPA.
- **Odor and vapor/dust control/monitoring**. Excavation in MGP contamination areas could result in significant odor concerns (as well as health and safety issues). Odor control procedures might include: limiting the area of open excavations; shrouding excavations with physical barriers (textile covers) or structural enclosures; and/or use (with or without additives) of foams, sprays or misting systems. Dust control procedures would include: use of water spray (with or without additives) for roads, trucks, excavation areas and stockpiles; use of tarps to cover stockpiles; use of gravel or recycled concrete aggregate (or other suitable materials) to provide a clean and dust-free road surface; use of a truck wash at site access/egress points; and the potential implementation of a sprung structure or similar enclosure surrounding excavation or staging areas to control dust and vapors. In addition, during excavation and loading of any hazardous waste or MGP-contaminated or petroleum-contaminated soil, real-time vapor and fugitive dust particulate (PM10) monitoring would be performed through a Community Air Monitoring Program (CAMP). The CAMP could include fixed air monitoring and meteorological stations, and action levels and corrective measures to be taken when values indicate responses are necessary. Throughout demolition and construction, erosion and sediment controls would be implemented to comply with the NYSDEC State Pollution Discharge Elimination System (SPDES) general permit for Construction Activity. A Stormwater Pollution Prevention Plan (SWPPP) and appropriate best management practices (BMPs) for construction activities involving soil disturbances would be implemented. Additional dust control measures may include: use of stone and gravel pads at entryways; use of mulch and hydro seeding in areas that will remain open or for long-term soil stockpiles; barriers (wind fences) to reduce wind impacts; and administrative controls such as establishing traffic patterns and speeds, establishing unsafe wind speeds and atmospheric conditions, managing and optimizing earth moving steps, and establishing stockpile configuration.

- **Contingency Plan**. Given the unknown origin of the project site's fill material and other uncertainties, the discovery of unknown structures or contaminated media during excavation is possible. Any such findings would be reported to the appropriate regulatory and/or emergency management agencies. Petroleum spills will immediately be reported to the NYSDEC Spill Hotline. Petroleum tanks will be addressed in accordance with applicable Petroleum Bulk Storage (PBS) requirements and guidelines, including those relating to spill reporting and tank registration.
- **Underground tanks** or other sources of contamination encountered during construction activities. Petroleum spills would be reported to the NYSDEC Spill Hotline. Petroleum tanks would be addressed in accordance with applicable NYSDEC requirements, including those relating to spill reporting and tank registration;
- **Import of backfill or clean cover soil** from off-site sources. Material from industrial sites, spill sites, environmental remediation sites, or other potentially contaminated sites would not be used. Testing for import of clean cover soil or fill would be performed in accordance with DER-10 Table 5.4(e) 10 guidance and 6 NYCRR Part 375 Soil Cleanup Objectives (unless regulatory approval has been obtained for alternative requirements).
- **Reuse of on-site materials**. Soil meeting the definition of hazardous waste or containing petroleum, MGP-related contamination, or other types of gross contamination would not be reused, and would be disposed of at an approved off-site treatment or disposal facility. Although not anticipated, other soil could potentially be reused in accordance with NYSDEC's requirements for beneficial reuse (6 NYCRR 360-1.15[b][8]) related to *"nonhazardous, contaminated soil which has been excavated as part of a construction project… and which is used as backfill for the same excavation or excavations containing similar contaminants at the same site"*. <u>Additionally, soil treated by thermal desorption can be reused, if residual contaminant levels meet the applicable NYSDEC requirements.</u>
- **Off-Site Transportation and Disposal**. Outbound trucks will be inspected and cleaned if necessary before leaving, and all access/egress points for trucks and equipment will be kept clean of site-derived materials. Locations where vehicles exit the site will be inspected daily for evidence of soil tracking off premises. Truck wash facilities will be used as necessary to limit soil tracking onto adjacent streets. Cleaning of the adjacent streets will be performed as needed. Open uncontrolled mechanical processing of historical fill or contaminated soil on-site would not be performed. Loaded vehicles leaving the site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws, regulations, and guidelines. Routes on- and off-site will be routinely monitored for build-up of excessive soils and dust and cleaned as necessary. Material transport to the site will be organized and scheduled to minimize truck queuing. A manifest-based tracking system will be used to document the proper management of material to its final destination. Trucks will be expected to use DOT-designated truck routes. All material will be disposed of in accordance with applicable laws, regulations and guidelines. A documentation/manifest process will be used to document conformance with applicable laws, regulations and guidelines.
- **Demarcation**. Following any soil contaminant "hot spot" removal, prior to backfilling, the top of the residual soil/fill will be established by placement of a demarcation layer (e.g., a geotextile liner); or by land survey; or material beneath the backfill will be considered contaminated and subject to management as such after the project is complete.
- **Stockpile Methods**. Stockpiles of excavated material will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, as well as before and after every storm event, in order to ensure they are not subject to excessive erosion.

Stockpiles of soil exhibiting evidence of contamination will be placed on a layer of impervious material and kept covered with appropriately anchored plastic tarps when not being loaded/unloaded. Stockpiles will be encircled with rigid barriers and/or silt fencing. Stockpiles will be managed appropriately with respect to anticipated end-use. Excavated materials from suspected areas of contamination will be separated from materials intended for re-use. Imported materials will be stockpiled separately. All designated stockpile areas shall be kept free of standing water at all times. Stockpiles will be managed to control stormwater run-off in accordance with applicable laws, regulations, and guidelines. Stockpiles will be located away from the Canal and property boundaries, where possible.

- **Preparation of close-out documentation**. Following completion of all soil disturbance associated with Project construction, appropriate closure reports (i.e., Remedial Action Reports) would be prepared documenting regulatory compliance with the approved design, plans and permits. For the Head End Site, a Site Management Plan (SMP) is required pursuant to the July 2015 NYSDEC ROD to address long-term requirements for managing residual contaminated subsurface material. It is anticipated that an SMP also would be prepared for the Owls Head Site pending the results of ongoing investigations.

OPERATIONAL PHASE

Following construction, residual contamination would remain at the Head End Site and possibly at the Owls Head Site. However, the areas that were disturbed during construction, such as for the below-grade structures, above-grade structures, and other impermeable surfaces, would be restored with appropriate engineering controls (e.g., cap or cover comprised of buildings, pavement or clean soil) with demarcation where required to indicate the presence of residual soil/fill with known/potential contamination. As such, this would prevent exposure by workers and the community to subsurface contaminants remaining beneath the Project construction areas. Any residual contamination would be subject to NYSDEC (and potentially USEPA) controls, through SMPs. This will ensure that any subsequent subsurface disturbance at the Project Site, e.g., for repairs or construction of new or upgraded facilities, would be conducted in a safe manner that is protective of the general public, workers, and the environment. The required procedures, and the areas/depths at which additional safety measures would be required, would be set out in the SMPs.

Once operational, the CSO Facilities will provide ongoing benefits by reducing the volume of CSO discharged to the Canal.

With implementation of the measures described above, the Project would not result in any significant adverse effects related to hazardous materials during either construction or operation.

H. REFERENCES

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Chapter 11: Water and Sewer Infrastructure

A. INTRODUCTION

This chapter assesses the potential effects of the Project on existing and planned water and sewer infrastructure. According to the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, projects that increase density (i.e., projects that exceed certain development thresholds) or change drainage conditions on a large site (generally five acres or larger) require a water and sewer infrastructure analysis. For portions of Brooklyn that are served by a combined sewer system, the development thresholds are 400 residential units or 150,000 square feet (sf) of commercial, public facility, institution, and/or community facility space. The Project would not result in development exceeding the thresholds requiring a detailed analysis and would not generate new sewer demand. The Project would also not result in a development that would require an exceptionally large demand for potable water or result in a development that is located in an area that experiences low water pressure; therefore, an analysis of water supply is not necessary.

However, the Project would introduce two additional combined sewer overflow (CSO) facilities (the Head End Facility and the Owls Head Facility), and would include infrastructure upgrades and system rerouting to redirect flow to the Facilities to further reduce the volume of combined sewer overflows entering the Canal. Therefore, this chapter provides an assessment of the CSO Facilities and associated new or modified infrastructure components, including proposed new or modified regulators, outfalls, and pumping stations. In particular, the chapter includes an analysis of the potential effects of the Project on stormwater management related to the reduction of CSO solids and assesses the Facilities' potential effects on wastewater treatment and conveyance infrastructure, including increased dry-weather wastewater treatment demand at the Red Hook (RH) and Owls Head (OH) Wastewater Treatment Plants (WWTPs) and potential effects on the collection system upstream of the Facilities.

B. REGULATORY CONTEXT

Because the Project would alter existing infrastructure or include installation of additional sewer infrastructure, the Project would require compliance with federal, state, and local legislation and regulatory programs, or equivalency with these programs. The Project would achieve compliance with all applicable policies, as described below.

FEDERAL

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA OR SUPERFUND).

As discussed in Chapter 1, "Project Description," the Project is mandated by the U.S. Environmental Protection Agency (USEPA) to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, commonly known as Superfund). The Canal was designated a Superfund site by USEPA under CERCLA and placed on the CERCLA National Priorities List (NPL) in 2010. The main goal of the CERCLA process is to remediate constituents of concern in the Canal sediments that were deposited over the Canal's long industrial history. Following the Superfund designation, USEPA issued a Record of Decision (USEPA ROD) in September 2013 identifying actions to be undertaken by various parties to remediate contamination in the Canal. As part of the ROD, USEPA mandated the construction of the two Gowanus Canal CSO Facilities. In the USEPA ROD, USEPA established a regulatory objective of 58 to 74 percent solids load reduction.

CLEAN WATER ACT AND COMBINED SEWER OVERFLOW CONTROL POLICY

The objective of the Federal Water Pollution Control Act (33 USC §§ 1251 to 1387), also known as the Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of United States' waters. It regulates point sources of water pollution, such as discharges of municipal sewage and industrial wastewater, and the discharge of dredged or fill material into navigable waters and other waters of the United States. The Act also regulates non-point source pollution from sources other than the end of a pipe, such as runoff from streets, agricultural fields, construction sites, and mining that enter waterbodies.

Under Section 401 of the Act, any applicant for a federal permit or any license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge would occur or from an interstate water pollution control agency, that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the CWA. Applicants for discharges to navigable waters in the State of New York must obtain a Water Quality Certificate from the New York State Department of Environmental Conservation (NYSDEC).

Section 402 of the Act provides guidance on the National Pollutant Discharge Elimination System (NPDES), which governs the issuance of permits to control and prevent water pollution at point sources that discharge pollutants. In the State of New York, the NPDES permit program is administered by NYSDEC through the State Pollutant Discharge Elimination System (SPDES) permit program, described below.

In 1994, USEPA implemented the Combined Sewer Overflow Control Policy (the "CSO Control Policy") to provide guidance to help areas served by combined sewer systems meet the objectives of the CWA; the CSO Control Policy was codified as part of the CWA in 2000 (EPA FRL-4732-7, 59 Federal Register 18688). The CSO Control Policy provides site-specific guidance and flexibility to help communities implement CSO controls necessary to meet appropriate health and environmental objectives. This includes the guidance to permittees and permitting authorities on the development and implementation of Long Term Control Plans (LTCPs). The CSO Control Policy also establishes reporting measures to assess the progress made on federal, state, and local levels in enforcing and implementing the policy.

As discussed in Chapter 1, "Project Description," in accordance with the CWA and the CSO Control Policy, in 2015, DEP prepared a LTCP for the Canal to identify the need for additional controls to achieve waterbody-specific water quality standards (WQS). The LTCP includes alternatives that consider a wide range of reductions in CSO—up to 100 percent CSO control—including investments that would be made by DEP through green and grey infrastructure. Intermediate levels of CSO volume control—approximately 50 percent and 75 percent—were also evaluated. The intermediate levels of CSO control analyzed in the LTCP were selected based on the CSO controls evaluated as part of the Superfund framework. The controls that were evaluated included construction of CSO storage tank facilities, a CSO control tunnel, and construction/installation of a fully separated stormwater sewer system in the Project area. The LTCP determined that the existing WQS are being met as a result of significant improvements and capital upgrades implemented by DEP under the preceding Gowanus Canal Waterbody/Watershed Facility Plan (WWFP), which included operation of the reactivated Flushing Tunnel and upgrade of the Gowanus Wastewater Pumping Station. In particular, the LTCP determined that water quality in the

Canal met the standards for its NYSDEC classification[1] and that fecal bacteria levels in the Canal met the WQS for primary recreational contact.[2] The LTCP also concluded that with the build-out of planned green infrastructure and high level storm sewers in the area, water quality would further be improved. While a range of CSO controls were evaluated per USEPA's CSO Policy in the development of the LTCP, it was concluded that additional CSO controls were not needed, particularly given the current attainment of water quality standards.

Although existing WQS are being met, the USEPA ROD for the Gowanus Canal Superfund Site instructs the City to construct CSO controls that would serve to further improve water quality by reducing CSO solids being discharged to the Canal.

NEW YORK STATE

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES)

Title 8 of Article 17 of the New York Environmental Conservation Law, Water Pollution Control, authorized the creation of the SPDES permit program to regulate discharges to the state's waters. Activities requiring a SPDES permit include point source discharges of wastewater into surface or ground waters of the State, including the intake and discharge of water for cooling purposes; constructing or operating a disposal system (sewage treatment plant); discharge of stormwater; and construction activities that disturb one acre or more.

As noted in Chapter 1, "Project Description," the Project may require approvals under the SPDES program. In particular, modifications to the combined sewer system in the RH and OH WWTP service areas associated with the CSO Facilities, including modifications to outfalls discharging from the system into the Canal, would require modifications to the existing SPDES permits for the RH and OH WWTPs, respectively.

NEW YORK CITY

RULES OF THE CITY OF NEW YORK

Chapter 31 of Title 15 of the Rules of the City of New York establishes guidelines for the issuance of permits for the construction, repair, alteration, and inspection of all sewer connections. All permit applications are to be submitted to and reviewed by DEP.

COMBINED SEWER OVERFLOW ABATEMENT PROGRAM & COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN (DEP)

Implemented by DEP, the objective of this program and plan is to reduce pollution in and around the City's waters. The plan provides for field investigations, sewer system and water quality monitoring, and modeling in areas that are heavily impacted by CSOs to determine appropriate mitigation measures. The

[1] NYSDEC has designated the Gowanus Canal Class SD above Hamilton Avenue, and Class I below Hamilton Avenue. The best usage of Class SD waters is fishing; the best usage of Class I waters is secondary contact recreation (recreational activities where contact with the water is minimal and where ingestion of the water is not probable, e.g., boating) and fishing.

[2] Primary recreational activities consist of activities where the human body may come in direct contact with water, e.g., swimming or diving.

program aims to establish source controls and stormwater best management practices best suited for New York City. As noted above, DEP prepared a LTCP for the Gowanus Canal in 2015, which determined that existing WQS are being met as a result of recent significant upgrades and capital improvements, and that water quality would be further improved with the build-out of planned green infrastructure and high level storm sewers.

C. EXISTING SEWER INFRASTRUCTURE

CITYWIDE COMBINED SEWER INFRASTRUCTURE

New York City is served by separate sanitary and storm sewer systems as well as combined sewer systems. As the name suggests, the separate sewer systems transport stormwater runoff and sanitary flows in separate pipe networks. Stormwater is channeled directly to local waterbodies and sanitary waste is transported to WWTPs. In contrast, areas serviced by combined sewer infrastructure convey combined stormwater and sanitary flows (combined sewer flow) in the same pipe network to treatment facilities, which are regulated under the City’s SPDES permits for each WWTP. Approximately 60 percent of New York City’s sewers are combined systems. The City’s overall combined sewer system is divided into drainage areas, which are individual networks of interconnected pipes that consolidate combined sewer flow and transport it to single discharge points at the interceptors (the large sewers that bring the wastewater to the WWTPs for treatment).

During dry weather, the combined sewer pipes convey sanitary flow to the WWTP. However, during and immediately following certain significant precipitation events, the combined sewer lines convey both sanitary flow and stormwater. Stormwater enters the combined sewer system through catch basins, located primarily at the intersections of roadways and along curbs. In those situations, the WWTPs treat the combined sewage at their maximum treatment rates in accordance with the WWTP’s SPDES Permit, and the excess combined sewage overflows into the City’s surrounding waterbodies without treatment at designated outfall locations. The flow to the outfalls is controlled by structures known as regulators. These regulators, along with other controls, minimize combined sewer overflows as identified in the City’s LTCP to achieve water quality standards, consistent with the federal CSO Policy and water quality goals of the CWA.

Regulators serve three principal purposes: (1) to divert flow in the combined sewers to the large interceptor sewers which conveys flow to the wastewater treatment facility; (2) to prevent overloading of the interceptor and downstream treatment works during high combined sewer flow events; and (3) to divert flow in excess of the system’s capacity to CSO outfalls. DEP generally employs static regulators, which passively respond to variations in the water level of the combined sewer, to regulate the flow to the interceptor. Under normal operating conditions, combined sewer flow passes completely to the interceptor through the regulator. However, during higher flow events, excess flow is diverted by the regulator through an associated outfall. In order to prevent backflow into the system, regulators include tide gates that only allow for flow to be discharged to the outfall when there is a sufficient difference in the hydraulic grade lines (HGL)[3] between the receiving water body’s tide level and the combined sewer system’s water level.

[3] Hydraulic grade line (HGL) refers to the water elevation within a sewer system.

RED HOOK AND OWLS HEAD WWTP'S

A sewershed typically describes a geographic region in which all wastewater flows converge at a single point, or outlet, before ultimately being conveyed to a WWTP. The Gowanus Canal sewershed encompasses approximately 1,760 acres, of which approximately 1,600 acres are served by combined sewers that convey flows to the Red Hook (RH) and Owls Head (OH) WWTPs, two of the City's 14 WWTPs. At the WWTPs, wastewater is treated by physical and biological processes before it is discharged as effluent. The quality of the effluent at each WWTP is regulated by each WWTP's respective SPDES permit, which is issued by NYSDEC and establishes limits for effluent parameters (i.e., suspended solids, fecal coliform bacteria, and other pollutants). Since the volume of flow to a WWTP affects the level of treatment the plant can provide, the SPDES permit also establishes a maximum permitted capacity. For the RH WWTP, the maximum permitted dry weather capacity is 60 million gallons per day (MGD); the average monthly flow to the RH WWTP over the past 12 months was 27 MGD,[4] which is approximately 45 percent of the permitted capacity. For the OH WWTP, the maximum permitted dry weather capacity is 120 MGD; the average monthly flow to the OH WWTP over the past 12 months was 93 MGD, which is approximately 78 percent of the permitted capacity.

STUDY AREA

The water and sewer infrastructure study area for the Project consists of the Canal's sewershed in the RH and OH WWTPs service areas. There are seven CSO outfalls that discharge to the Canal from the RH service area, and five CSO outfalls that discharge to the Canal from the OH service area. The flow to these outfalls is regulated under the RH and OH WWTP SPDES permits and controlled by regulators located along the Canal. Outfalls RH-034 and OH-007 discharge the greatest amount of combined sewer flow in the RH and OH service areas, respectively, as measured by activation frequency and overflow volume. Additional sewer infrastructure in the study area includes the Gowanus Wastewater Pumping Station and the Nevins Street Pumping Station in the RH WWTP service area, as well as the 2nd Avenue Pumping Station in the OH WWTP service. A detailed discussion of the existing sewer infrastructure in the study area that would be affected by the Project is provided in Chapter 1, "Project Description."

D. CSO FACILITY OPERATION

As described in Chapter 1, "Project Description," during certain wet weather events, combined sewer flow would be conveyed to the CSO Facilities by gravity, where it would be stored and receive primary treatment, first passing through a screening system for removal of large debris prior to entering the storage tank, then through a degritting system as it leaves the tank. The flow would be held in the storage tanks until there is sufficient downstream capacity to convey the stored flow to either the RH or OH WWTP, and would then be pumped back to the sewer system. The pump-back system would be sized to return the full contents of the storage tanks (i.e., 8 million gallons [MG] at the Head End Facility and 4 MG at the Owls Head Facility) within 24 hours following a wet weather event to reduce the potential for odors and to allow the storage tanks to receive additional flow.

Excess flow (i.e., exceeding capacity of the tanks) would pass through the Facilities and would discharge to the Canal via bypass channels through outfall RH-038 at the Head End Facility and the new OH-007 outfall at the Owls Head Facility. Influent wet weather flows that exceed the capacity of the tanks are

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[4] Twelve-month period through January 2017.

expected to occur during less than 20 percent of the typical year storm events at the Head End Facility and less than 10 percent of the typical year storm events at the Owls Head Facility.

ADDITIONAL SEWER SYSTEM IMPROVEMENTS

As part of the Project, in order to convey flow to and from the Facilities, additional improvements to the combined sewer system infrastructure are required. In particular, as discussed in Chapter 1, “Project Description,” changes will be made to sewer line routing in the area near the Facilities.

In order to divert the flow from the RH-034 outfall to the Head End Facility, modifications would be made to the existing RH-034 regulator structure, including the installation of new bending weirs and replacement of the tide gates. Routing of additional sewer system flows to the Head End Facility, including wet weather flows from adjacent outfalls (RH-033, RH-037, RH-038, and RH-036), would be accomplished by constructing a new sewer on Nevins Street from the intersection with Sackett Street to the intersection with Butler Street (see Figure 1-12). In addition, the associated CSO regulators for these outfalls, located in Nevins Street, would be completely upgraded. Outfalls RH-037 and RH-036, together with outfall RH-034 would remain open and would still be used during high intensity rainfall events. Outfall RH-033, which is located on the Head End Site, would be closed. The Nevins Street Pumping Station and force main would be eliminated and the outfall pipe for the RH-038 outfall (on Degraw Street, between the intersection with Nevins Street and the Canal) would be replaced.

In order to capture the total design flow rates required for the Owls Head Facility, the existing 2nd Avenue regulator, located just north of the 2nd Avenue and 5th Street intersection, would be replaced with a new 2nd Avenue regulator to direct the flow to the new Facility. Other existing sewer infrastructure, including the existing grit chamber, the outfall (OH-007, located at the end of 2nd Avenue), and the 2nd Avenue Pumping Station located adjacent to the site, would be demolished and removed. A new outfall and a new, similar pumping station with a 1 MGD capacity would be constructed within the Owls Head Facility. In addition, the existing bulkhead at the Owls Head Facility would be replaced (see Figure 1-15). Flow from the Owls Head Facility would be pumped to the Owls Head Interceptor through an existing regulator located at the intersection of 3rd Avenue and 7th Street. A new force main would be constructed to connect the Owls Head Facility to the Owls Head Interceptor for delivery of flow to the Owls Head WWTP once there is sufficient downstream capacity in the sewer system.

E. PROBABLE IMPACTS OF THE PROJECT

As noted above and discussed in detail in Chapter 1, “Project Description,” the CSO Facilities would reduce the volume of CSO discharged from outfalls RH-034 and OH-007 in order to reduce CSO solids discharged to the Canal. In addition to analyzing the projected reduction of CSO solids, the Facilities and related modifications to the sewer infrastructure required as part of the Project were also analyzed to determine their potential effects on wastewater treatment and conveyance infrastructure; in particular, this analysis included potential effects on treatment demand at the RH and OH WWTPs, as well as potential increases in surcharge[5] within the collection system and flooding upstream of the Facilities.

[5] Surcharge refers to the condition in which combined sewer flow exceeds the capacity of downstream sewer pipelines, resulting in overflow from upstream pipelines and catch basins.

DESIGN METHODOLOGY AND INFOWORKS HYDRAULIC MODELING

Sewer infrastructure must be designed so as to not increase the water elevation in the collection system—referred to as the hydraulic grade line (HGL)—since doing so may induce or exacerbate flooding issues. This concept is referred to as “hydraulic neutrality.” The potential for the Project to increase HGL within the Canal’s water/sewershed was analyzed using an InfoWorks collection system model, based on data and models previously developed and verified by USEPA. The model determines the predicted surcharge and flooding for the existing sewer system under the influence of specified design rainfall conditions. The model also evaluates the performance of the CSO Facilities and related infrastructure improvements to determine the HGL in the sewer lines within the water/sewershed and, thus, can pinpoint the locations of surcharge within the collection system under a variety of storm conditions.

These models have been calibrated and updated over time, and were most recently used in support of the Gowanus Canal LTCP. The InfoWorks model software uses the full Saint-Venant differential equations for momentum and continuity to solve for time-varying flows, levels and velocities in a collection system. Both the hydrology (conversion of rainfall to runoff from the land surface) and hydraulics (movement of water through the collection system) modules are included in the InfoWorks software framework. Calibrated InfoWorks models have been accepted by NYSDEC and USEPA as the basis for analyzing a variety of collection system projects throughout the State and nation, respectively.

The InfoWorks model was used to predict flows, volumes, and HGL in the watershed/sewershed system under annual average (2008 typical year) and design storm (5-year, 2-hour and 5-year, 24-hour) conditions, consistent with the long-term rainfall conditions utilized in the LTCP. The rainfall year of 2008 was previously established for LTCP purposes as the single calendar year capable of representing average conditions over time. The design storm modeling was utilized to determine the Project’s performance during peak flow conditions: the DEP Borough of Water and Sewer Operations (BWSO) often utilizes a 5-year design storm condition for drainage planning purposes. In addition, as the Canal is a tidally influenced waterbody, the Facilities’ performance is affected by tide levels, in that discharges can only occur when the upstream sewer HGL is higher than the downstream tide level. Accordingly, facilities that convey water out to the Canal must be designed with tide conditions in mind. Tide data from the National Oceanic and Atmospheric Association (NOAA) at various locations in the greater New York City harbor area were incorporated into the model framework to account for the Canal’s impacts on CSO solids discharged to the Canal.

CSO REDUCTION AND STORMWATER MANAGEMENT IN THE CANAL SEWERSHED

The CSO Facilities are being designed to meet the goals of the USEPA ROD, specifically a 58 to 74 percent reduction in CSO solids discharging to the Canal from the RH-034 and OH-007 outfalls. In a memorandum to file issued on June 9, 2016, USEPA stated that the size of the two storage tanks shall be 8 million gallons (MG) at the Head End Facility and 4 MG at the Owls Head Facility.

By intercepting the CSO volume prior to discharge, solids loading to the Canal via CSO discharges are reduced. The reduction of CSO solids was estimated using both a volume basis approach and a total suspended solids (TSS) load reduction approach.

To estimate the reduction in solids loading to the Canal using a volume basis approach, it was conservatively assumed that the reduction of total CSO volume is equal to the reduction in solids loading (i.e., by reducing the typical year CSO volume by 58 to 74 percent, it is expected that the solids loading to the Canal would also be reduced by the same percentage). This is a conservative assumption since it is expected that a good portion of the solids would be carried through the combined sewer system to the WWTP at the beginning of the wet weather event. Further, the tanks would be partitioned into cells.

When CSOs are detained in the tanks, settling within the cells would further improve solids loading reductions beyond the model's predicted estimate. The typical year solids load reduction by volume basis for the 8 MG tank at the Head End Facility was estimated to be 76 percent. The typical year solids load reduction by volume basis for the 4 MG tank at the Owls Head Facility was estimated to be 85 percent.

The TSS load reduction approach supplements the volume basis approach through modeling simulations to determine the solids removal efficiency of the 8 MG and 4 MG tanks, accounting for the many factors that affect the removal of solids in the tanks, including the TSS concentration, CSO volume, peak flow rate, and the surface area of the tank's basins, which affects the amount of solids that settle to the bottom of the tank and are removed from the stored flow. The TSS load reduction modeling found that both the 8 MG tank at the Head End and the 4 MG tank at the Owls Head Facility would result in a similar or increased reduction in solids loads as compared to the volume basis approach. Therefore, the CSO Facilities would meet or exceed the USEPA ROD goals for CSO solids reduction.

DRY-WEATHER TREATMENT DEMAND AT THE RED HOOK AND OWLS HEAD WWTPS

As noted above, per their respective SPDES permits, the maximum permitted dry weather capacities of the RH and OH WWTPs are 60 MGD and 120 MGD, respectively, and both Facilities are operating well below these levels. The SPDES permits for both the RH and OH WWTPs also require an 85 percent removal of influent TSS. Over the ~~past~~ 12-month period from January 2016 through January 2017, the RH and OH WWTPs have been in compliance with their respective SPDES permits with regard to maximum permitted flow capacity and effluent TSS. In particular, in addition to operating below their maximum permitted capacity, both the RH and OH WWTPs currently have an adequate safety factor in terms of percent TSS removal. On average, the influent TSS removal is 97 percent at the RH WWTP and 90 percent at the OH WWTP, exceeding the 85 percent removal required by the SPDES permits.

Pump-back events from the CSO Facilities to the WWTPs following wet-weather events are expected to occur approximately 40 to 50 times per year, and would take place during dry-weather flow conditions. The maximum pump-back volume from the Head End Facility would be 8 MG to the RH WWTP over a 24-hour period (a maximum pump-back rate of 0.33 MG per hour), and the corresponding maximum pump-back volume from the Owls Head Facility would be 4 MG to the OH WWTP (a maximum pump-back rate of 0.17 MG per hour). These flows—which account for approximately 13 percent and 3.3 percent of the permitted dry weather treatment capacities of the RH and OH WWTPs, respectively—and their associated TSS loads can be readily accommodated by the plants, based on their available capacities as described above.

Based on the information presented above, and the design of the CSO Facilities, CSO pump-back from the Head End and Owls Head Facilities would not adversely affect wastewater treatment performance at the OH and RH WWTPs.

CONVEYANCE SYSTEM UPSTREAM OF THE CSO FACILITIES

Effects of sewer infrastructure changes on the upstream system were determined through a hydraulic modeling analysis, which established the HGL necessary to achieve hydraulic neutrality. Specifically, for both CSO Facilities, the hydraulic analysis was utilized in the design of all elements of the Project, including conveyance piping, storage tanks, and screening systems, based on a modeled 5-year, 2-hour storm, and accounting for tide levels in the Canal. Based on the parameters established by the hydraulic analysis, the Facilities and related improvements (e.g., pumping station and regulator upgrades) have been designed so as to not result in new adverse conditions upstream. As described in greater detail below, the Project has been designed with a hydraulic profile that ensures all flow is conveyed through the system by gravity and any unusually large flows that cannot be stored and processed by the CSO Facilities are discharged to the Canal before causing upstream flooding or basement backups.

HEAD END FACILITY

Influent flow enters the RH-034 regulator and is conveyed to the Gowanus Pumping Station. When the influent flow begins to exceed the Gowanus Pumping Station capacity (30 MGD) and the water elevation in the RH-034 regulator exceeds the regulator's diversion weir elevation (-2.55 feet), the flow would be diverted into the Head End Facility. As this weir elevation has historically prevented any nuisance or dry weather overflow events, it will continue to be used to divert flow to the Head End Facility.

Based on the hydraulic analysis, hydraulic neutrality at the existing RH-034 regulator has been established at an elevation of 3.9 feet NAVD88. During instances when the tank is full and wet weather flows exceed the Facility's flow-through hydraulic capacity, flows would discharge via bending weirs upstream of the Facility to a bypass channel and into the Canal through the existing RH-034 outfall. The elevation of 3.9 feet NAVD88 was used as the trigger elevation for this new bending weir system. Therefore, conditions that cause the hydraulic grade to rise higher than 3.9 feet NAVD88, such as storm events that result in flows to the Facility exceeding its capacity and/or high tide conditions in the Canal, would result in the tipping of the bending weir, allowing the flow to bypass the Facility and discharge directly to the Canal without resulting in upstream surcharge. Any modifications to the RH-034 regulator would be designed so that it produces a HGL equal to less than 3.9 feet NAVD88, thus maintaining hydraulic neutrality.

OWLS HEAD FACILITY

Influent flow to the OH-007 regulator is currently conveyed to the 2nd Avenue Pumping Station, which pumps a small amount of flow back to the combined sewer. With the Project, flows would be diverted into the Owls Head Facility when influent flows begin to exceed the 2nd Avenue Pumping Station capacity (1 MGD) and the water elevation in the OH-007 regulator exceeds the diversion weir elevation of -0.12 feet NAVD88. As this weir elevation has historically prevented any nuisance or dry weather overflow events, it will continue to be used to divert flow to the Owls Head Facility.

Hydraulic neutrality at the OH-007 regulator has been established as the HGL elevation during a modeled 5-year 2-hour storm when the tide in the Canal is at mean high water level; this HGL elevation is 3.6 feet NAVD88. The new 2nd Avenue regulator to be constructed with the Project will be designed to produce an HGL equal to or less than the existing HGL at this location, which will allow flow to be conveyed to the Facility. The hydraulic elevations of the Facility's storage inlet channel and tank overflow weir will be designed to be below the base peak HGL elevations as determined by the modeled storm conditions, which will allow flow to be conveyed through the Facility to the new relocated OH-007 outfall that will be constructed with the Project, and for excess flow exceeding the capacity of the Facility to bypass it and discharge to the outfall directly.

Based on the information presented above, and the design of the CSO Facilities, the Project would not exacerbate any current conditions related to surcharging sewers and would not adversely affect sanitary and stormwater drainage and management.

F. CONCLUSION

The Project would meet the goals of the USEPA ROD, and would not adversely affect wastewater treatment performance at the RH and OH WWTPs or sanitary and stormwater drainage and management.✷

Chapter 12: Solid Waste and Sanitation Services

A. INTRODUCTION

A solid waste and sanitation services assessment is intended to determine whether a project has the potential to cause a substantial increase in solid waste production that could overburden available waste management capacity or otherwise be inconsistent with New York City's Solid Waste Management Plan (SWMP) or with New York State policy. The 2014 *City Environmental Quality Review (CEQR) Technical Manual* recommends a detailed analysis of solid waste impacts for projects that would result in substantial amounts of solid waste (generally 50 tons per week or more).

As discussed below, operation of the two Combined Sewer Overflow (CSO) Facilities would not result in solid waste generation exceeding 50 tons per week, so a detailed assessment of solid waste impacts is not necessary. Nevertheless, the *CEQR Technical Manual* recommends that the solid waste and service demand generated by a project be disclosed; therefore, this chapter estimates the amount of solid waste that would be generated by the Project and describes the solid waste removal services that would be utilized for the Facilities.

B. SCREENING ASSESSMENT

The CSO Facilities at the Head End and Owls Head Sites would be largely automated, either in a fully automatic mode or remotely controlled from the Red Hook and Owls Head Wastewater Treatment Plants (WWTPs), and would not require permanent staffing. During operation of the CSO Facilities, which during a typical year is expected to occur approximately 40 to 50 times, up to two personnel would be on site at each CSO Facility to monitor and manage equipment operations. Assuming a rate of 13 pounds per week per employee[1] and assuming a maximum of four employees, the CSO Facilities would generate an estimated 52 pounds of solid waste per week.

As discussed in Chapter 1, "Project Description," the CSO Facilities would also be equipped with screening systems to remove large debris from influent flow to the tanks as well as grit removal systems to remove materials such as silt, sand, and gravels (commonly referred to as "grit") from the stored flow prior to discharging to the sewer system. Residual solids from both the screening systems and the grit removal systems would be collected and stored in a 26- to 30-cubic-yard dumpster (with holding capacity for approximately 35 to 40 tons) located on-site at each Facility. After each CSO event—a wet weather event during which combined sewer flow (i.e., stormwater and sanitary sewage) would be conveyed to the Facilities and detained—each dumpster would be picked-up and replaced by a waste-hauling company under contract with the City of New York.

[1] Estimate utilizes the solid waste generation rate for office workers; see the *CEQR Technical Manual,* Table 14-1.

Based on the information presented above, operation of the Project would result in a level of solid waste generation that would be easily accommodated by existing waste transfer operators serving the Project sites and the surrounding neighborhood. Therefore, the Project would not result in any adverse impacts on solid waste and sanitation services, and no further analysis is necessary. ✷

Chapter 13: Energy

A. INTRODUCTION

This chapter considers the potential for the Project to result in significant adverse energy impacts. The 2014 *City Environmental Quality Review (CEQR) Technical Manual* recommends a detailed analysis of energy impacts for projects that could significantly affect the transmission or generation of energy, or cause substantial new consumption of energy. Operation of the two Combined Sewer Overflow (CSO) Facilities would not result in any of these conditions; therefore, a detailed assessment of energy impacts is not necessary. Nevertheless, the *CEQR Technical Manual* recommends that a project's energy consumption be calculated and disclosed, and so this chapter estimates the amount of energy that would be consumed by the Project.

B. DISCLOSURE OF PROJECT ENERGY CONSUMPTION

ENERGY SUPPLY AND TRANSMISSION IN NEW YORK CITY

Within New York City, electricity is generated and delivered to most users by Con Edison as well as a number of independent power companies. Electrical energy in New York City is drawn from a variety of sources that originate in various locations, including sites within New York City and other locations across the Northeast. Sources of energy include non-renewable sources such as oil, natural gas, and coal fuel; and renewable sources, such as hydroelectricity and, to a much lesser extent, biomass fuels, solar power, and wind power.

Con Edison distributes power throughout New York City and Westchester County. Transmission substations receive electricity from the regional high voltage transmission system and reduce the voltage to a level that can be delivered to area substations. Area substations further reduce the voltage to a level that can be delivered to the distribution system, or the street "grid." Within the grid, voltage is further reduced for delivery to customers. Each substation serves one or more distinct geographic areas, called networks, which are isolated from the rest of the local distribution system. If service is lost at a specific substation or substations, the network functions to isolate any problems from other parts of the City. Substations are also designed to have sufficient capacity for the network to grow.

In ~~2015~~ 2016 (the latest year for which data are available), approximately 57 billion kilowatt hours (KWH) of electricity, or 194 trillion British Thermal Units (BTUs), were delivered in Con Edison's service area. In addition, Con Edison supplied approximately ~~156~~ 153 trillion BTUs of natural gas and approximately ~~22~~ 20 billion pounds of steam, which is equivalent to approximately ~~26~~ 21 trillion BTUs. In total,[1] Con Edison provides approximately ~~376~~ 368 trillion BTUs of energy within the New York City and Westchester County service area annually.

[1] Consolidated Edison Annual Report, 2016~~5~~ (http://phx.corporate-ir.net/phoenix.zhtml?c=61493&p=irol-reportsannual)

EXISTING SITE ENERGY CONSUMPTION

The existing uses at the Head End and Owls Head Sites currently include several active industrial and commercial facilities—automobile repair shops, electrical and plumbing contractors, and shipping businesses. These facilities that would be displaced as a result of the Project total approximately 89,126 square feet (sf) of space.[2] For analysis purposes, these uses are assumed to consume energy at the industrial building type rate of 554,300 BTU/sf/year as defined in Table 15-1 of the *CEQR Technical Manual*. Therefore, the existing total energy consumption at the Head End and Owls Head Sites is estimated at 49,403 million BTUs per year.

PROJECT ENERGY CONSUMPTION

The CSO Facilities are expected to be in operation approximately 40 to 50 times during a typical year, and are estimated to require a total of approximately 10.5 million BTUs in energy consumption per year (approximately 7 million BTUs at the Head End Facility and approximately 3.5 million BTUs at the Owls Head Facility), a net decrease in energy consumption as compared with the existing facilities that would be displaced as a result of the Project.

Compared with the approximately ~~376~~ 368 trillion BTUs of energy provided by Con Edison within the New York City and Westchester County service area, the Project's energy consumption would be considered negligible. The load and service connections necessary to accommodate the CSO Facilities will be confirmed in consultation with Con Edison during detailed design**.** Therefore, the Project is not expected to result in any significant adverse impacts to energy generation or transmission, and no further analysis is warranted. ✷

[2] Existing energy consumption estimate does not include the film production studio on the Head End Site (Block 425, Lot 1) that is intended to be used as a construction staging area, as this site may be redeveloped with a facility that complies with zoning following construction of the Head End Facility.

Chapter 14: Transportation

A. INTRODUCTION

This chapter examines the potential effects of the Project on the transportation systems surrounding the project sites. The analysis presented was conducted pursuant to the methodologies outlined in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*.

B. SCREENING ASSESSMENT

The *CEQR Technical Manual* recommends a two-tier screening procedure to determine if further transportation analyses are warranted. This methodology begins with the preparation of a trip generation analysis (Level 1 screening) to estimate the volume of pedestrian and vehicle trips attributable to the Project. If the Project is expected to result in fewer than 50 peak hour vehicle trips and fewer than 200 peak hour transit or pedestrian trips, further quantified analyses are not warranted. When these thresholds are exceeded, detailed trip assignments (Level 2 screening) are performed to estimate the incremental trips and to identify potential locations for further analyses. If the trip assignments show that the Project would generate 50 or more peak hour vehicle trips through an intersection, 50 or more peak hour bus riders on a bus route in a single direction, 200 or more peak hour subway passengers at any given station, or 200 or more peak hour pedestrian trips per pedestrian element (i.e. sidewalks, crosswalks, corners), further quantified analyses may be warranted to evaluate the potential for significant adverse traffic, transit, pedestrian, and parking impacts.

During typical operating conditions, the Combined Sewer Overflow (CSO) Facilities at the Head End and Owls Head Sites would either be fully automatic or remotely controlled from the Red Hook and Owls Head Wastewater Treatment Plants (WWTPs), and would not require permanent staffing. Under wet weather events, which during a typical year are expected to occur approximately 40 to 50 times, up to two personnel would travel to each Facility to monitor and manage equipment operations. During and after such events, a waste hauling company would pick up the grit removed from the tanks, which would constitute minimal and intermittent truck trips.

Additionally, as discussed in Chapter 1, “Project Description,” it is anticipated that some type of publicly accessible open space or waterfront access would be developed at the Head End Site as part of the Project. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies. For the EIS analyses, it is assumed this space would be a maximum of approximately 2.4 acres (the total area of the Head End Site, excepting the construction staging area). Per the *CEQR Technical Manual*, this potential open space would generate a maximum of 20 person trips and two vehicle trips during any one hour during the weekday and 28 person trips and 4 vehicle trips during any one hour during peak Saturday periods.

As a result, the operation of the Project would generate nominal amounts of operational peak hour traffic, transit, and pedestrian trips, and would be well below the *CEQR Technical Manual* Level 1 screening thresholds. Therefore, detailed traffic, transit, pedestrian, and parking analyses are not warranted and the Project is not anticipated to result in any significant adverse transportation impacts. ✷

Chapter 15: Air Quality

A. INTRODUCTION

The Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) would result in the construction and operation of CSO Facilities at two sites along the Gowanus Canal. The potential for air quality impacts from the Project is examined in this chapter. Air quality impacts can be either direct or indirect. Direct impacts result from emissions generated by stationary sources, such as exhaust from fossil fuel-fired heating and hot water systems or emissions from odor control ventilation. Indirect impacts are caused by emissions from on-road vehicle trips generated by the Project or other changes to future traffic conditions due to the Project.

The Project would not significantly alter traffic conditions. The maximum hourly incremental traffic from the Project would not exceed the 2014 *City Environmental Quality Review* (*CEQR) Technical Manual* carbon monoxide (CO) screening threshold of 170 peak hour trips at nearby intersections in the study area, nor would it exceed the particulate matter (PM) screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*. Therefore, there is no potential for mobile-source impacts from the Project, and a quantified assessment of mobile-source emissions is not warranted.

The Head End Facility and the Owls Head Facility would include a natural gas-burning heating, ventilation, and air conditioning (HVAC) system~~, an emergency generator~~, and an odor control system. Therefore, a stationary source analysis was conducted to evaluate potential future pollutant concentrations from these sources. Following publication of the Draft EIS (DEIS), the designs for the Head End Facility and the Owls Head Facility were updated and the emergency generators were eliminated. The updated results are presented below.

B. METHODOLOGY

POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide (NO) and nitrogen dioxide (NO_2), collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources, and some sources utilizing non-road diesel such as large international marine engines. On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs. Ambient concentrations of CO, PM, NO_2, SO_2, ozone, and lead are regulated by the U.S. Environmental Protection Agency (USEPA) under the Clean Air Act (CAA), and are referred to as ‘criteria pollutants’; emissions of VOCs, NO_x, and other precursors to criteria pollutants are also regulated by USEPA. Hydrogen sulfide (H_2S), a 'non-criteria pollutant', is associated with sulfur-based odor-causing compounds and is commonly used as a trace odor indicator in determining potential off-site odors from wastewater treatment operations.

CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can diminish rapidly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled, and congested roadways, parking lots, and garages. Consequently, CO concentrations from mobile sources are generally analyzed on a local (microscale) basis.

The Project is not expected to significantly alter traffic conditions and would result in fewer new peak hour vehicle trips than the *CEQR Technical Manual* screening threshold of 170 trips at nearby intersections in the study area; therefore, a quantified assessment of mobile CO concentrations is not warranted. Potential CO concentrations from the stationary sources, i.e., the HVAC systems~~, and emergency generators~~ were analyzed.

NITROGEN OXIDES, VOCS, AND OZONE

NO_x emissions are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it has generally been of concern further downwind from large stationary point sources, and not a local concern from mobile sources. (NO_x emissions from fuel combustion consist of approximately 90 percent NO and 10 percent NO_2 at the source.) However, with the promulgation of the 2010 1-hour average standard for NO_2, local sources, such as vehicular emissions, may also be of concern.

The Project would not have a significant effect on the overall volume of vehicular travel in the metropolitan area; therefore, no measurable impact on regional NO_x emissions, ozone levels, or NO_2 emissions is predicted from mobile sources.

Potential impacts on local NO_2 concentrations from the Project's stationary HVAC systems ~~and emergency generators~~ were evaluated.

LEAD

Airborne lead emissions are currently associated principally with industrial sources. Lead in gasoline has been banned under the CAA and would not be emitted from any other component of the Project. Therefore, an analysis of this pollutant is not warranted.

RESPIRABLE PARTICULATE MATTER—PM_{10} AND $PM_{2.5}$

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

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

Gasoline and diesel-powered vehicles, especially heavy duty trucks and buses operating on diesel fuel, are significant sources of respirable PM, most of which is $PM_{2.5}$; PM concentrations may consequently be locally elevated near roadways. The Project would not result in any significant increases in truck traffic near the Project Sites or in the region, or any other potentially significant increase in $PM_{2.5}$ vehicle emissions as defined in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*. Therefore, an analysis of potential PM concentrations from mobile sources is not warranted.

Potential PM concentrations from the HVAC system ~~and emergency generators~~ were analyzed.

SULFUR DIOXIDE

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). SO_2 is also of concern as a precursor to $PM_{2.5}$ and is regulated by USEPA as a $PM_{2.5}$ precursor under the New Source Review permitting program for large sources. Due to the federal restrictions on the sulfur content in diesel fuel for on-road and non-road vehicles, no significant quantities of SO_2 are emitted from vehicular sources; therefore, analysis of SO_2 from mobile sources is not warranted.

As part of the Project, the HVAC systems would utilize natural gas, ~~and the emergency generators would utilize ultra-low sulfur distillate (ULSD) fuel oil; both of~~ which ~~have~~ has negligible levels of sulfur; therefore, impacts of SO_2 would not be significant. Following publication of the DEIS, the design of the CSO Facilities were updated and the emergency generator systems were eliminated. The emergency generators were planned to utilize ultra-low sulfur distillate (ULSD) fuel oil. While ULSD fuel oil also has negligible levels of sulfur, ~~Nevertheless~~ the *CEQR Technical Manual* identifies SO_2 emissions associated with the use of fuel oil; therefore, potential SO_2 concentrations from stationary sources were examined in the DEIS.

HYDROGEN SULFIDE

Many of the odor-causing compounds associated with wastewater and CSO facilities are sulfur-based compounds, such as H_2S, and mercaptans. H_2S is the most prevalent malodorous gas associated with domestic wastewater collection. The conditions leading to H_2S formation usually favor the production of other odorous gases, such as ammonia, mercaptans, and reduced sulfur compounds, which may have considerably higher detectable odor thresholds, and consequently H_2S may be an indicator of their presence. H_2S is commonly used as a trace odor indicator for the following reasons:

- It is always present in wastewater collection operations;
- It has a unique, unpleasant, and discernable odor character (rotten eggs);
- It has a very low odor recognition threshold (approximately 4 to 5 parts per billion [ppb] by volume in air detected by the average person);
- It is heavier than air, and will therefore accumulate in low-lying areas; and
- It can be monitored by hand-held and/or stationary instruments.

Therefore, H_2S was used as an indicator of potential off-site odors from the Project.

AIR QUALITY REGULATIONS, STANDARDS, AND GUIDANCE THRESHOLDS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the CAA, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO_2, ozone, respirable PM (both $PM_{2.5}$ and PM_{10}), SO_2, and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation’s welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary standards are generally either the same as the secondary standards or more restrictive. The NAAQS are presented in **Table 15-1**. The NAAQS for CO, annual NO_2, and 3-hour SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particles, settleable particles, non-methane hydrocarbons, 24-hour and annual SO_2, and ozone which correspond to federal standards that have since been revoked or replaced, and for the noncriteria pollutants beryllium, fluoride, and H_2S.

Table 15-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary ppm	Primary µg/m³	Secondary ppm	Secondary µg/m³
Carbon Monoxide (CO)				
8-Hour Average	9[1]	10,000	None	
1-Hour Average	35[1]	40,000		
Lead				
Rolling 3-Month Average[2]	N/A	0.15	N/A	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average[3]	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average[4,5]	0.070	140	0.070	140
Respirable Particulate Matter (PM_{10})				
24-Hour Average[1]	N/A	150	N/A	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean[6]	N/A	12	N/A	15
24-Hour Average[7]	N/A	35	N/A	35
Sulfur Dioxide (SO_2) [8]				
1-Hour Average[9]	0.075	196	N/A	N/A
Maximum 3-Hour Average[1]	N/A	N/A	0.50	1,300

Notes:
Ppm—parts per million (unit of measure for gases only)
µg/m³—micrograms per cubic meter (unit of measure for gases and particles, including lead)
N/A—not applicable
All annual periods refer to calendar year.
Standards are defined in ppm. Approximately equivalent concentrations in µg/m³ are presented.
[1] Not to be exceeded more than once a year.
[2] USEPA has lowered the NAAQS down from 1.5 µg/m³, effective January 12, 2009.
[3] Three-year average of the annual 98th percentile daily maximum 1-hr average concentration. Effective April 12, 2010.
[4] Three-year average of the annual fourth highest daily maximum 8-hr average concentration.
[5] USEPA has lowered the NAAQS down from 0.075 ppm, effective December 2015.
[6] Three-year average of annual mean. USEPA has lowered the primary standard from 15 µg/m³, effective March 2013.
[7] Not to be exceeded by the annual 98th percentile when averaged over 3 years.
[8] USEPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010.
[9] Three-year average of the annual 99th percentile daily maximum 1-hr average concentration.
Source:
40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by

USEPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

New York City is in attainment for CO and $PM_{2.5}$ under maintenance plans, in attainment for the annual-average NO_2 standard, is in a moderate NAA for ozone, and is currently designated as “unclassifiable/attainment” for the 1-hour NO_2 standard. USEPA has deferred action to designate areas for SO_2 1-hour attainment status until additional data is gathered.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

The State Environmental Quality Review Act (SEQRA) regulations and the *CEQR Technical Manual* state that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected.[1] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see **Table 15-1**) would be deemed to have a potential significant adverse impact.

In addition, in order to maintain ambient concentrations below the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels (*de minimis* criteria) have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

$PM_{2.5}$ De Minimis Criteria

The New York State Department of Environmental Conservation (NYSDEC) has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts.[2] This policy applies only to facilities applying for permits or major permit modifications under SEQRA that emit 15 tons of PM_{10} or more annually. The policy states that such a project will be deemed to have a potentially significant adverse impact if the project’s maximum impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 $\mu g/m^3$ averaged annually or more than 5 $\mu g/m^3$ on a 24-hour basis. Projects that exceed either the annual or 24-hour threshold will be required to prepare an Environmental Impact Statement (EIS) to assess the severity of the impacts, to evaluate alternatives, and to employ reasonable and necessary mitigation measures to minimize the $PM_{2.5}$ impacts of the source to the maximum extent practicable.

In addition, New York City uses *de minimis* criteria to determine the potential for significant adverse $PM_{2.5}$ impacts under CEQR as follows:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Annual average $PM_{2.5}$ concentration increments that are predicted to be greater than 0.1 $\mu g/m^3$ at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or at a distance from a roadway

[1] New York City. *CEQR Technical Manual*. Chapter 1, section 222. March 2014; and SEQR Regulations. 6 NYCRR § 617.7

[2] NYSDEC. *CP33: Assessing and Mitigating Impacts of Fine Particulate Emissions*. December 29, 2003.

corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or

- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.3 µg/m^3 at a discrete receptor location (elevated or ground level).

Actions under CEQR predicted to increase $PM_{2.5}$ concentrations by more than the above *de minimis* criteria will be considered to have a potential significant adverse impact.

The Project's annual emissions of PM_{10} are estimated to be less than 1 ton per year, well below the 15 ton per year threshold under NYSDEC's $PM_{2.5}$ policy guidance; however, the above *de minimis* criteria have been used to evaluate the significance of predicted $PM_{2.5}$ concentrations.

Odor Criteria

The criteria used to assess odor impacts are the City's *CEQR Technical Manual* odor threshold of 1 parts per billion (ppb) for H_2S at sensitive receptors, and the New York State Ambient Air Quality Standard (NYSAAQS) of 10 ppb H_2S in ambient air (both 1-hour average concentrations). Implicit in the use of 1 ppb H_2S as the significant odor threshold is that any control measures that may be needed to achieve this threshold will at the same time address other residual odors that are common to CSO storage facility operations. Since the level is extremely low, and is at the lowest end of the detection range of currently available monitoring technology, compliance with this criterion is demonstrated with air dispersion models. The 1-hour average NYSAAQS of 10 ppb H_2S, applicable for all locations beyond the fence line of the CSO storage Facilities, is used to protect the quality of life for the surrounding community.

Potential H_2S concentrations from each facility's odor control system were compared with the City's *CEQR Technical Manual* screening level odor threshold of 1 ppb for H_2S at sensitive receptors. Modeled H_2S concentrations were added to nearby sources and ambient background concentrations and compared with the NYSAAQS of 10 ppb H_2S in ambient air (i.e., at all off-site locations).

STATIONARY SOURCE ANALYSIS

The following section describes the modeling methodology used to assess the potential impacts from the Project's stationary sources of emissions within the study area (i.e., locations within 1,000 meters of each CSO Facility). Emissions from the HVAC systems ~~and emergency generators~~ were modeled to determine potential concentrations of the criteria air pollutants: NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$.[3] Emissions from the odor control systems were modeled to determine potential odor concentrations.

MODEL SELECTION

Potential impacts from the Project's odor control units~~,~~ and HVAC system~~, and emergency generators~~ were evaluated using a refined dispersion model, the USEPA/AMS AERMOD dispersion model (version 16216r). AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.

[3] Following publication of the Draft EIS (DEIS), the designs for the Head End Facility and the Owls Head Facility were updated and the emergency generator systems were eliminated. The updated results are presented below.

The AERMOD model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on hourly meteorological data, and has the capability of calculating pollutant concentrations at locations when the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. The analyses of potential impacts from exhaust stacks was performed assuming stack tip downwash, urban dispersion and surface roughness length (with and without building downwash), and elimination of calms.

The AERMOD model also incorporates the algorithms from the Plume Rise Model Enhancements (PRIME) model, which is designed to predict impacts in the "cavity region" (i.e., the area around a structure which, under certain conditions, may affect an exhaust plume, causing a portion of the plume to become entrained in a recirculation region). The Building Profile Input Program (BPIP) program for the PRIME model (BPIPRM) was used to determine the projected building dimensions modeling with the building downwash algorithm enabled. The modeling of downwash from sources accounted for all obstructions within a radius equal to five obstruction heights of the stack.

Per the *CEQR Technical Manual*, the analysis was performed both with and without downwash in order to assess potential impacts at both ground level and elevated receptors.

EMISSION RATES AND STACK PARAMETERS

Table 15-2 presents the emission rates and stack parameters that were used in the modeling analyses.

Table 15-2
Emission Rates and Stack Parameters

Stack Parameters (1)(2)	Head End Facility		Owls Head Facility	
	Boiler HVAC System	Odor Control System	Boiler HVAC System	Odor Control System
Stack Height above grade (ft)	60	85	60	53
Stack Diameter (ft)	1.17	6.0	1.00	4.5
Exhaust Flowrate (acfm)(3)	1,347	69,000	1,084	40,000
Exhaust Velocity (ft/s)(3)	21.00	40.67	23.00	41.92
Exhaust Temperature (F)	300	65	300	65
Stack Configuration	Vertical	Vertical	Vertical	Vertical
Emission Rates (g/s) (4)				
NO2, 1-hour	1.29×10^{-2}	N/A	2.07×10^{-2}	N/A
NO2, Annual	1.77×10^{-3}	N/A	5.17×10^{-3}	N/A
CO, 1-hour	2.17×10^{-2}	N/A	1.74×10^{-2}	N/A
CO, 8-hour	2.17×10^{-2}	N/A	1.74×10^{-2}	N/A
PM10, 24-hour	1.18×10^{-3}	N/A	9.43×10^{-4}	N/A
PM2.5 24-hour	1.18×10^{-3}	N/A	9.43×10^{-4}	N/A
PM2.5 Annual	2.69×10^{-4}	N/A	7.86×10^{-4}	N/A
SO2, 1-hour	1.55×10^{-4}	N/A	1.24×10^{-4}	N/A
SO_2, 3-hour	1.55×10^{-4}	N/A	1.24×10^{-4}	N/A
H2S, 1-hour	N/A	1.15×10^{-3}	N/A	6.66×10^{-4}

Notes:
* This table has been updated for the FEIS.
N/A—Not Applicable
(1) Following publication of the DEIS, updated designs for the two facilities eliminated the emergency generator systems.
(2) Stack exhaust information, such as exhaust diameter, flowrate, and temperature are based on design criteria for a single stack. Exhaust velocity is calculated using these values.
(3) Listed exhaust flowrates and exhaust velocities are representative for maximum operating load.
(4) The Head End Facility would include two, 4.185 MMBtu/hr boilers. The Owls Head Facility would include two, 3.35 MMBtu/hr boilers. Boiler emission rates presented are for a single boiler stack.
Peak hourly (1-hour, 3-hour, and 8-hour) emission rates assume boilers operating at 100 percent load.
Peak daily (24-hour) emission rates assumes boilers operating at 60 percent load.
Annual average emission rates assume boilers operating at 50 percent load during the heating season (i.e., 100 days between the late fall to the early spring).

~~*Emergency Generators*~~

~~The Head End Facility would include one 1,100 kilowatt (KW) diesel-fired emergency generator. The Owls Head Facility would include one 650 KW diesel-fired emergency generator.~~

~~The emergency generators would exhaust through the roof of each Facility at a minimum exhaust height of three feet above the height of the roof (53 feet above grade). The stack exhaust parameters, such as diameter, exhaust flowrate, and temperature are based on similar sized engines used in industry. The emergency generators would be regulated under the federal New Source Performance Standards (NSPS) under 40 CFR 60 IIII for Stationary Compression Ignition Internal Combustion Engines. Emission rates for NOx, CO, PM_{10}, and $PM_{2.5}$ are assumed to comply with NSPS limits and PM_{10} and $PM_{2.5}$ emissions are assumed equal to total PM emissions. The emission rates for SO_2 were obtained from federal AP-42 emission factors[4] assuming the use of ULSD fuel, per USEPA regulation, with a sulfur content of 15 parts~~

~~[4] USEPA. Compilation of Air Pollutant Emission Factors AP-42. 5th Ed., V. I, Ch. 3.4. October, 1996.~~

~~per million (ppm) in the fuel. The emission rates are based on a representative maintenance testing schedule and assume each generator would operate at full, 100 percent load for approximately one hour per week for a total of 52 hours per year per generator. The emergency generators would not participate in peak shaving or demand response programs, such as the New York Power Authority (NYPA) or New York Independent Systems Operator, Inc. (NYISO) peak load shaving programs.~~

~~Per USEPA guidance,[5] due to the intermittent nature of the emergency generator sources (i.e., operation only once per week for maintenance testing) and variability in meteorological conditions,~~ ~~NO_2 and SO_2 1-hour impacts—where the statistical form of the standard incorporates the 98th and 99th percentile values—was not analyzed.~~

HVAC Systems

The Head End Facility would include ~~three~~ two boilers, each with a maximum heat input capacity of ~~3~~ 4.185 million British thermal units per hour (MMBtu/hr). The Owls Head Facility would include ~~three~~ two boilers, each with a maximum heat input capacity of ~~2~~ 3.35 MMBtu/hr. The boilers exhaust ~~at a minimum of three~~ ten feet above the height of the roof (~~53~~ 60 feet above grade) through ~~three~~ two separate exhaust stacks at each Facility.

Under short-term peak operating conditions ~~two~~ one of the ~~three~~ boilers would operate at a daily (24-hour) average of 60 percent load and an hourly (1-hour, 3-hour, and 8-hour) maximum of 100 percent load, with the ~~third~~ second boiler available as a standby unit.

Under annual average operating conditions, ~~two~~ one of the ~~three~~ boilers at each Facility would operate at 50 percent load with the ~~third~~ second boiler available as a standby unit. In addition, the boilers would only operate during the heating season.

Emission rates for each of the boiler systems were calculated based on the maximum heat input capacity, operating load, and federal AP-42 emission factors for natural gas-fired boilers equipped with low NO_x burner controls.[6] $PM_{2.5}$ emissions include both the filterable and condensable portions.

Odor Control Systems

The odor control system at each Facility consists of multiple activated carbon odor control units vented to a single exhaust stack and would be designed according to industry standards.[7] A 25 ppb H_2S stack exhaust concentration limit would be specified, consistent with many New York City Department of Environmental Protection (DEP) activated carbon odor control systems.

At the Head End Facility, the odor control stack would exhaust to ambient air at a minimum of 35 feet above the roof (85 feet above grade). At the Owls Head Facility, the odor control stack would exhaust at a minimum of 3 feet above the roof (53 feet above grade). The exhaust flowrates from the odor control systems at the Head End and Owls Head Facilities are ~~85,000~~69,000 cubic feet per minute (cfm) and ~~50,000~~40,000 cfm, respectively. Using these exhaust flowrates, the maximum total H_2S emission rates are ~~1.42~~1.15x10^{-3} grams per second (g/s) and ~~8.33~~6.66x10^{-4} g/s from the odor control systems at the Head End and Owls Head Facilities, respectively.

~~[5] USEPA, 2011. Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 NAAQS, Air Quality Modeling Group, C439-01, March 1, 2011.~~

[6] USEPA. Compilation of Air Pollutant Emission Factors AP-42. 5th Ed., V. I, Ch. 1.4. July 1998.

[7] Carbon adsorbers can commonly achieve 99 percent and greater H_2S removal.

NO_2 CONCENTRATIONS

Annual NO_2 concentrations from the ~~emergency generator and~~ HVAC systems are estimated using a NO_2 to NO_x ratio of 0.75, as described in USEPA's Guideline on Air Quality Models at 40 CFR part 51 Appendix W, Section 4.2.3.4.[8]

One-hour average NO_2 concentration increments from the HVAC systems are estimated using the AERMOD model's Plume Volume Molar Ratio Method (PVMRM) module that analyzes chemical transformation within the model. The PVMRM module incorporates hourly background ozone concentrations to estimate NO_x transformation within the source plume. Ozone concentrations were obtained from the NYSDEC Queens College monitoring station that is the most representative ozone monitoring station that has complete five years of hourly data available. An initial NO_2 to NO_x ratio of 10 percent at the source exhaust stack was assumed.[9]

The potential NO_2 1-hour concentrations represent the five-year average of the annual 98th percentile of the maximum daily 1-hour average from the Project added to ambient background concentrations (see "Background Concentrations," below).

METEOROLOGICAL DATA

The meteorological data set consists of five consecutive years of meteorological data: surface data collected at John F Kennedy Airport (2012–2016), and concurrent upper air data collected at Brookhaven, New York. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevation over the five-year period. These data sets were processed using the USEPA AERMET program (version 16216) to develop data in a format which can be readily processed by the AERMOD model. The land uses around the site where meteorological surface data is available was classified using categories defined in digital United States Geological Survey (USGS) maps to determine surface parameters used by the AERMET program.

RECEPTOR LOCATIONS

A comprehensive receptor network (i.e., locations with continuous public access) was developed for the modeling analyses (see **Figure 15-1**).

Sensitive receptors were placed in the model at elevated operable windows, balconies, air intakes, and publicly accessible ground-level locations. The Head End Facility would be located in the area that is bounded by Butler Street to the north, Degraw Street to the south, Bond Street to the west, and Nevins Street to the east. The Owls Head Facility would be located in the area that is bounded by 5th Street to the north, 6th Street to the south, 2nd Avenue to the east, and the Gowanus Canal to the west.

Sensitive receptors in the Head End site study area are primarily three-story residential condominiums, publically accessible sidewalks, the Gowanus Canal, the Thomas Greene Playground, the Gowanus House residential buildings and the Wyckoff Gardens New York City Housing Authority buildings, the publically accessible open space located at the Head End site, and planned future projects in the study area, including the hotels at 239 Butler Street and 489 Baltic Street.

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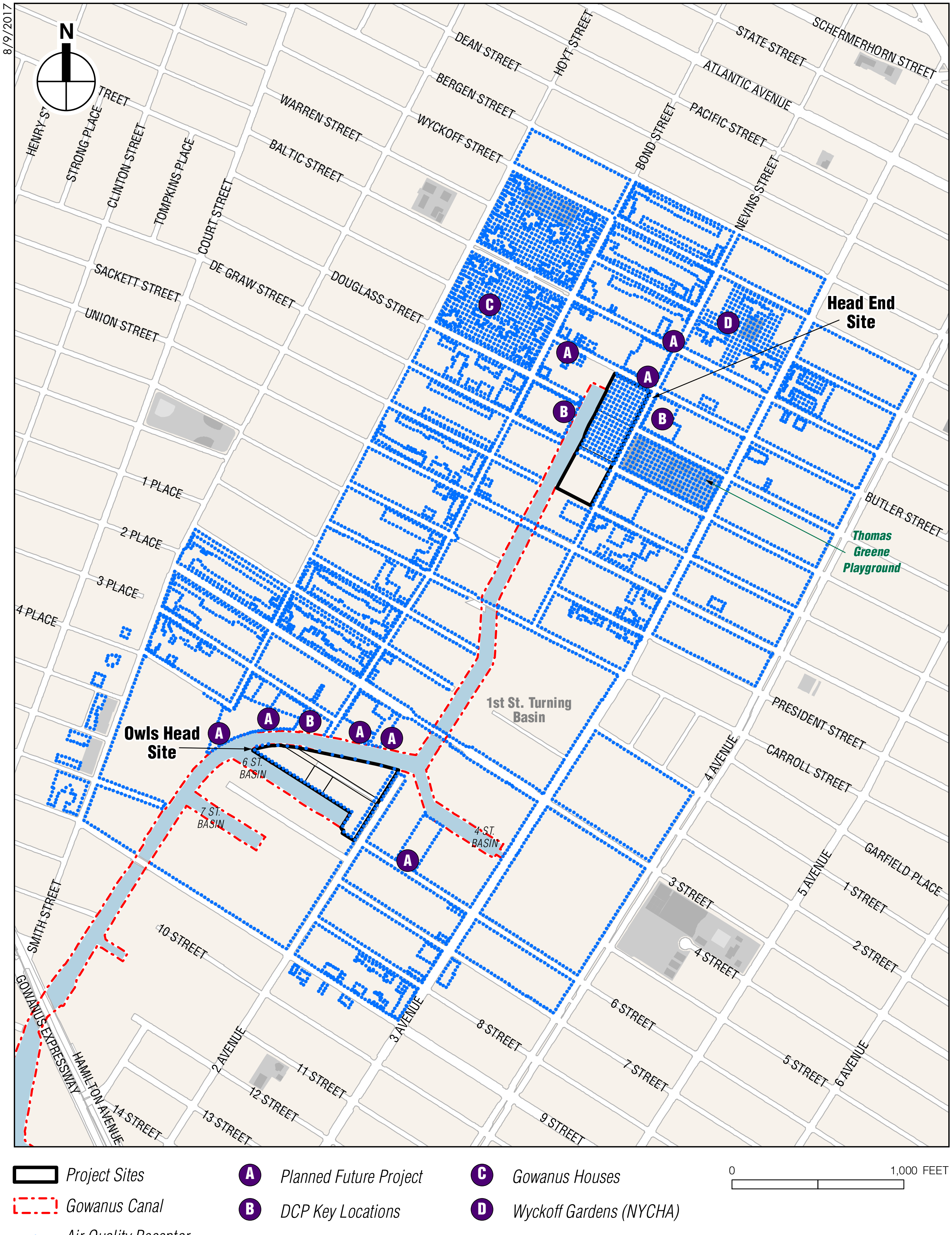
[8] https://www.gpo.gov/fdsys/pkg/FR-2017-01-17/pdf/2016-31747.pdf.

[9] NO_2 boiler emissions generally range from 1 to 5 percent of total NO_x. EPA. *NO_2/NO_x In-Stack Ratio (ISR) Database*. http://www3.epa.gov/scram001/no2_isr_database.htm



Gowanus Canal CSO Facilities

Air Quality Receptor Locations

Figure 15-1

Sensitive receptors in the Owls Head site study area include the outdoor open space at Whole Foods Market, one- to three-story residences, the Gowanus Waterfront Park, luxury residences at 365 Bond Street, and planned future projects in the study area, including the open space associated with the Gowanus Green development directly west of the Owls Head Site across the Canal.

Finally, consistent with 2016 *Bridging Gowanus* study, a comprehensive planning study of the neighborhood under the City's Planning for Livability, Affordability, Community, Economic Opportunity and Sustainability (PLACES) program, initiated by the Department of City Planning (DCP), conservative analysis receptors were also placed at key locations identified to conservatively evaluate the Project's effect on potential future land use changes.

In addition to sensitive receptors, fence line receptors as well as a discrete 1 kilometer (km) by 1 km ground level Cartesian receptor grid centered at each Facility with 25-meter receptor spacing was included in the model to assess the potential for ground level and neighborhood level impacts.

Receptor elevations were determined using information from 1 degree United States Geological Survey (USGS) Digital Elevation Models (DEMs). The AERMAP pre-processor algorithms incorporated as part of the AERMOD model were used to account for varying ground level elevations and terrain in the area.

BACKGROUND CONCENTRATIONS

To estimate the maximum pollutant concentration at a given receptor, the predicted impacts were added to a background value that accounts for existing pollutant concentrations from other sources that are not directly accounted for in the model (see **Table 15-3**).

Table 15-3
Maximum Background Pollutant Concentrations

Pollutant	Average Period	Location	Units	Concentration	NAAQS
NO_2	Annual(1)	Queens College 2, Queens	µg/m³	32.9	100
	1-hour(2)	Queens College 2, Queens	µg/m³	112.2	188
CO	1-hour(3)	Queens College 2, Queens	µg/m³	2,176	40,000
	8-hour(3)		µg/m³	1,603	10,000
PM_{10}	24 Hour(3)	Division Street, Manhattan	µg/m³	44	150
$PM_{2.5}$	24 Hour(4)	JHS 126, Brooklyn	µg/m³	21.3	35
	Annual(5)		µg/m³	8.7	12
SO_2	1-hour(3)	Queens College 2, Queens	µg/m³	23.8	196
	3-hour(3)	Queens College 2, Queens	µg/m³	15.5	1,300
Lead	3-month(6)	JHS 126, Brooklyn	µg/m³	0.0061	0.15
Ozone	8-hour(7)	Queens College 2, Queens	ppm	0.071	0.075

Notes:
(1) Five-year maximum from 2012–2016.
(2) Three-year average of the annual 98th percentile daily maximum 1-hr average concentration (2014–2016).
(3) Five-year highest second-highest measured value from 2012–2016 except for PM10 which is based on the 3-year highest second-highest value from 2014–2016.
(4) Three-year average of the annual 98th percentile daily maximum 24-hr average concentration (2014–2016).
(5) Three-year average
(6) Three-month rolling average
(7) Fourth highest annual
Sources:
New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2012–2015
USEPA Air Quality System Data Mart. http://www.epa.gov/ttn/airs/aqsdatamart, 2016

The background levels are based on concentrations monitored at the nearest NYSDEC ambient air monitoring stations over a recent five-year period for which data are available, with the exception of PM_{10}, which is based on three years of data, consistent with DEP guidance. For the 3-hour SO_2, 24-hour PM_{10}, and CO averages, the highest second-highest measured values over the specified period are used. The annual average background values are the highest measured average concentrations. It was conservatively assumed that the maximum background concentrations occur on all days.

Consistent with NYSDEC's Division of Air Resources (DAR-1) guidelines, because there is no available H_2S background data in the area, background levels of H_2S are assumed to be zero.

Total 1-hour NO_2 concentrations were determined following methodologies that are accepted by USEPA, and which are considered appropriate and conservative for this analysis. The methodology used to determine the compliance of total 1-hour NO_2 concentrations from the Project's HVAC sources with the 1-hour NO_2 NAAQS[10] was based on adding the monitored background concentrations to modeled concentrations, as follows: hourly modeled concentrations from the Project's sources were first added to the seasonal hourly background monitored concentrations from the nearest representative monitoring station; then the highest combined daily 1-hour NO_2 concentration was determined at each receptor location and the 98th percentile daily 1-hour maximum concentration for each modeled year was calculated within the AERMOD model; finally the 98th percentile concentrations were averaged over the latest five years. Seasonal NO_2 and ozone background concentrations were utilized for missing hours.

C. EXISTING CONDITIONS

The maximum background pollutant concentrations as monitored by NYSDEC at air quality monitoring stations in **Table 15-3** are used as representative existing pollutant concentrations in the vicinity of the study area. In some cases, when no monitoring station is located nearby, the concentrations from other stations in the City are presented. In addition to CO, PM, and NO_2, concentrations of SO_2 and lead in New York City are well below the NAAQS. As described above, the New York City area is formally nonattainment for ozone. However, in the latest three years of data monitored from 2013 to 2015, the average 4th highest daily ozone concentration at Queens College was 0.071 parts per million (ppm), just below the 0.075 ppm NAAQS.

D. FUTURE CONDITIONS IN THE ANALYSIS YEAR

In the future conditions in the 2028 analysis year, there would be the development of limited hotel and office land use within the study area around the Head End and Owls Head Facilities that would not result in significant changes to existing air quality conditions.

Additionally, DCP along with other City agencies initiated a comprehensive planning study of the Gowanus neighborhood in order to develop a planning and land use framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study areas being rezoned to allow for residential use, among other uses and goals of the study, which is not presently permitted by the existing zoning in the area. However, the planning study is currently in its preliminary stages and its outcome and where new residential uses could be permitted is not known at this time. Therefore, the existing manufacturing uses

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[10] http://www.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf.

in the study area are assumed to remain in place in the 2028 analysis year and air quality conditions would remain similar to those presented in the existing conditions (see **Table 15-3**).

E. PROBABLE IMPACTS OF THE PROJECT

HEAD END FACILITY

HVAC ~~AND EMERGENCY GENERATORS~~SYSTEMS

Following publication of the DEIS, the design of the Head End Facility was updated and the emergency generator system was eliminated. Maximum potential criteria pollutant concentrations from the HVAC ~~and emergency generator~~ system at the Head End Facility are presented in **Table 15-4**. Maximum predicted concentrations were added to the maximum ambient background concentrations and compared to the NAAQS, with the exception of $PM_{2.5}$. $PM_{2.5}$ concentrations were compared to the *de minimis* criteria. Maximum criteria pollutant concentrations were less than the NAAQS and *de minimis* criteria and located approximately 60 feet from the Head End Facility at the future planned hotel under construction at 239 Butler Street and at one location identified to conservatively evaluate the Project's effect on potential future land use changes across from the Head End Facility on Nevins Street.

Table 15-4
Maximum Modeled Pollutant Concentrations—Head End Facility

Pollutant	Averaging Period	Units	Maximum Modeled Impact (1)	Background	Total Concentration	Criterion
NO_2	1-hour	µg/m³	NA	112.2	~~181.1~~158.0 (2~~1~~)	188 (3~~2~~)
	Annual	µg/m³	~~2.8~~0.9	32.9	~~35.7~~33.8	100 (3~~2~~)
CO	1-hour	µg/m³	~~4,017~~190	2,176	~~6,193~~2,366	40,000 (3~~2~~)
	8-hour	µg/m³	~~2,642~~151	1,603	~~4,245~~1,754	10,000 (3~~2~~)
PM_{10}	24-hour	µg/m³	~~6.1~~3.7	44	~~50.1~~47.7	150 (3~~2~~)
$PM_{2.5}$	24-hour	µg/m³	~~6.1~~3.7	N/A	~~6.1~~3.7	6.85 (4~~3~~)
	Annual—Discrete	µg/m³	~~0.18~~0.11	N/A	~~0.18~~0.11	0.3 (5~~4~~)
	Annual—Neighborhood	µg/m³	0.002	N/A	0.002	0.1 (5~~4~~)
SO_2	1-hour	µg/m³	~~1.7~~1.3	23.8	~~25.5~~25.1	196 (3~~2~~)
	3-hour	µg/m³	~~2.4~~1.3	15.5	~~17.9~~16.8	1,300 (3)
H_2S	1-hour	Ppb	~~0.75~~ 0.60	N/A	~~0.75~~ 0.60	1 or 10 (6~~5~~)

Notes:
N/A—Not Applicable
(1) Following publication of the DEIS, the design of the Head End Facility was updated and the emergency generator system was eliminated. Maximum modeled concentrations for the updated design of the Head End Facility are presented.
(2) The 1-hour average NO_2 concentration is estimated using seasonal hourly background concentrations per USEPA guidance.
(3) NAAQS.
(4) $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
(5) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor and neighborhood scale).
(6) The *CEQR Technical Manual* screening level odor threshold is 1 ppb H_2S at sensitive receptors and the 1-hour average NYSAAQS is 10 ppb H_2S in ambient air.

The Head End Facility's HVAC systems would not result in any significant adverse air quality impacts.

ODOR CONTROL SYSTEM

The maximum predicted 1-hour average H_2S concentration at a sensitive receptor as well as in ambient air was ~~0.75~~0.60 ppb (see **Table 15-4**), located at the future planned hotel under construction at 239 Butler Street across from the Head End site. This is below the 1 ppb significant odor threshold for sensitive receptors and well below the 10 ppb NYSAAQS in ambient air. Therefore, emissions from the odor control system at the Head End Facility would not result in any significant adverse odor impacts.

~~The Head End Facility's HVAC and emergency generator systems would not result in any significant adverse air quality impacts.~~

OWLS HEAD FACILITY

HVAC SYSTEMS~~AND EMERGENCY GENERATORS~~

Following publication of the DEIS, the design of the Owls Head Facility was updated and the emergency generator system was eliminated. Maximum potential criteria pollutant concentrations from the HVAC ~~and emergency generator~~ system at the Owls Head Facility are presented in **Table 15-5**. Similar to the Head End Facility, maximum predicted concentrations were added to the maximum ambient background concentrations and compared to the NAAQS, with the exception of $PM_{2.5}$. $PM_{2.5}$ concentrations were compared to the *de minimis* criteria. Maximum criteria pollutant concentrations were less than the NAAQS and *de minimis* criteria and located approximately 250 feet from the Owls Head Facility at future planned construction located across the Gowanus Canal.

Table 15-5
Maximum Modeled Pollutant Concentrations—Owls Head Facility

Pollutant	Averaging Period	Units	Maximum Modeled Impact (1)	Background	Total Concentration	Criterion
NO_2	1-hour	µg/m³	NA	112.2	~~122.5~~116.7 (2~~1~~)	188 (3~~2~~)
	Annual	µg/m³	~~2.1~~1.3	32.9	~~35.0~~34.2	100 (3~~2~~)
CO	1-hour	µg/m³	~~183~~25	2,176	~~2,359~~2,201	40,000 (3~~2~~)
	8-hour	µg/m³	~~141~~16	1,603	~~1,744~~1,619	10,000 (3~~2~~)
PM_{10}	24-hour	µg/m³	~~1.1~~0.7	44	~~45.1~~44.7	150 (3~~2~~)
$PM_{2.5}$	24-hour	µg/m³	~~1.1~~0.7	N/A	~~1.1~~0.7	6.85 (4~~3~~)
	Annual—Discrete	µg/m³	~~0.07~~0.16	N/A	~~0.07~~0.16	0.3 (5~~4~~)
	Annual—Neighborhood	µg/m³	~~0.004~~0.002	N/A	~~0.004~~0.002	0.1 (6~~4~~)
SO_2	1-hour	µg/m³	~~0.2~~1.3	23.8	~~24.0~~25.1	196 (3~~2~~)
	3-hour	µg/m³	~~0.3~~1.3	15.5	~~15.8~~16.8	1,300 (3)
H_2S	1-hour	ppb	~~0.27~~ 0.21	N/A	~~0.27~~ 0.21	1 or 10 (~~3~~5)

Notes:
N/A—Not Applicable
(1) Following publication of the DEIS, the design of the Owls Head Facility was updated and the emergency generator system was eliminated. Maximum modeled concentrations for the updated design of the Owls Head Facility are presented.
(2~~1~~) The 1-hour average NO_2 concentration is estimated using seasonal hourly background concentrations per USEPA guidance.
(3~~2~~) NAAQS.
(4~~3~~) $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
(5~~4~~) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor and neighborhood scale).
(6~~5~~) The *CEQR Technical Manual* screening level odor threshold is 1 ppb H_2S at sensitive receptors and the 1-hour average NYSAAQS is 10 ppb H_2S in ambient air.

The Owls Head Facility's HVAC ~~and emergency generator~~ system would not result in any significant adverse air quality impacts.

ODOR CONTROL SYSTEM

The maximum predicted 1-hour average H_2S concentration at a sensitive receptor as well as within ambient air was ~~0.27~~0.21 ppb (see **Table 15-5**), located at locations identified to conservatively evaluate the Project's effect on potential future land use changes across the Gowanus Canal. This is below the 1 ppb significant odor threshold for sensitive receptors and well below the 10 ppb NYSAAQS in ambient air. Therefore, emissions from the odor control system at the Owls Head Facility would not result in any significant adverse odor impacts.

COMBINED ASSESSMENT

Maximum ~~predicted~~ concentrations from the simultaneous operation of both the Head End Facility and the Owls Head Facility are presented in **Table 15-6**. Emissions from both Facilities were modeled together to obtain total combined maximum concentrations from the Project. Maximum combined concentrations occur 60 feet from the Head End Facility and are below the NAAQS, $PM_{2.5}$ *de minimis* thresholds, and the 1 ppb and 10 ppb odor criteria.

Table 15-6
Maximum Modeled Pollutant Combined Concentrations

Pollutant	Averaging Period	Units	Maximum Modeled Impact (1)	Background	Total Concentration	Criterion
NO_2	1-hour	µg/m³	NA	112.2	~~181.1~~158.0 (2~~1~~)	188(~~3~~2)
	Annual	µg/m³	~~2.8~~1.3	32.9	~~35.7~~34.2	100(~~3~~2)
CO	1-hour	µg/m³	~~4,017~~190	2,176	~~6,193~~2,366	40,000(~~3~~2)
	8-hour	µg/m³	~~2,642~~151	1,603	~~4,245~~1,754	10,000(~~3~~2)
PM_{10}	24-hour	µg/m³	~~6.1~~3.7	44	~~50.1~~47.7	150(~~3~~2)
$PM_{2.5}$	24-hour	µg/m³	~~6.1~~3.7	N/A	~~6.1~~3.7	6.85(~~4~~3)
	Annual—Discrete	µg/m³	~~0.19~~0.16	N/A	~~0.19~~0.16	0.3(~~5~~4)
	Annual—Neighborhood	µg/m³	~~0.005~~0.002	N/A	~~0.005~~0.002	0.1(~~5~~4)
SO_2	1-hour	µg/m³	~~1.7~~1.3	23.8	~~25.5~~25.1	196(~~3~~2)
	3-hour	µg/m³	~~2.1~~1.3	15.5	~~17.6~~16.8	1,300
H_2S	1-hour	ppb	~~0.75~~ 0.60	N/A	~~0.75~~ 0.60	1 or 10 (~~6~~5)

Notes:
N/A—Not Applicable
(1) Following publication of the DEIS, the design of the CSO Facilit~~y~~ies was updated and the emergency generator systems were eliminated. Maximum modeled concentrations for the updated design are presented.
(2) The 1-hour average NO_2 concentration is estimated using seasonal hourly background concentrations per USEPA guidance.
(3) NAAQS.
(4) $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
(5) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor and neighborhood scale).
(6) The *CEQR Technical Manual* screening level odor threshold is 1 ppb H_2S at sensitive receptors and the 1-hour average NYSAAQS is 10 ppb H_2S in ambient air.

Therefore, emissions from the combined operation of the Head End Facility and Owls Head Facility would not result in significant adverse air quality impacts.

F. CONCLUSION

The Project's HVAC systems ~~and emergency generators~~ would not result in an exceedance of the NAAQS or the City's $PM_{2.5}$ *de minimis* criteria. Additionally, the odor control units would not result in an exceedance of the 1 ppb significant odor threshold for sensitive receptors or the 10 ppb NYSAAQS in ambient air. Therefore, the Project would not result in significant adverse air quality impacts. ✷

Chapter 16: Greenhouse Gas Emissions and Climate Change

A. INTRODUCTION

As discussed in the Council on Environmental Quality's (CEQ) guidance, New York State Department of Environmental Conservation (NYSDEC) policy, and the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, climate change is projected to have wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although this is occurring on a global scale, the environmental effects of climate change, such as sea level rise and the increase in the frequency and severity of extreme weather events, are also likely to be felt at the local level. The United States, New York State, and New York City have all established sustainability initiatives and goals for greatly reducing greenhouse gas (GHG) emissions and for adapting to climate change. New York City's sustainable development policy, starting with PlaNYC, and continued and enhanced in OneNYC, includes GHG emission reduction goals, many specific initiatives that can result in emission reductions, and initiatives aimed at making New York City more resilient to climate change.

The first part of this chapter, Section B, "Greenhouse Gas Emissions," evaluates the GHG emissions that would be generated by the construction and operation of the Project and its consistency with the citywide GHG reduction and climate change resiliency goals. Operational emissions are quantified and sources of construction emissions are discussed qualitatively, along with the measures that would be taken to reduce those emissions to the maximum extent practicable.

The second part of this chapter, Section C, "Climate Change and Resilience," discusses projected future climate conditions and their potential effect on the Project. With the Project, two combined sewer overflow (CSO) facilities would be constructed to store stormwater and reduce CSO. The Project would include tanks for storing stormwater until there is sufficient downstream capacity to convey the stored flow to a wastewater treatment plant. Along with other green infrastructure and high level storm water sewer projects to control CSO, the Project would make the City more resilient to increased precipitation. Therefore, Section C also includes a discussion of the benefits of the Project as a resilience measure.

B. GREENHOUSE GAS EMISSIONS

POLICY, REGULATIONS, STANDARDS, AND BENCHMARKS FOR REDUCING GHG EMISSIONS

Because of the growing consensus that GHG emissions resulting from human activity have the potential to profoundly impact the Earth's climate, countries around the world have undertaken efforts to reduce emissions by implementing both global and local measures addressing energy consumption and production, land use, and other sectors. The U.S. Environmental Protection Agency (USEPA) is required to regulate GHGs under the Clean Air Act and has begun preparing and implementing regulations. There are also regional and local efforts to reduce GHG emissions. New York State has a goal to reduce GHG emissions by 80 percent, compared with 1990 levels, by 2050.

The New York State Energy Plan outlines the State's energy goals and provides strategies and recommendations for meeting those goals. The latest version of the plan was published in June 2015. The new plan outlines a vision for transforming the state's energy sector that would result in increased energy efficiency (both demand and supply), increased carbon-free power production and cleaner transportation, in addition to achieving other goals not related to GHG emissions. The 2015 plan also establishes new targets: (1) reducing GHG emissions in New York State by 40 percent, compared with 1990 levels, by 2030; (2) providing 50 percent of electricity generation in the state from renewable sources by 2030; and (3) increasing building energy efficiency gains by 600 trillion British thermal units (Btu) by 2030.

In New York City, the goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 ("30 by 30") was codified by Local Law 22 of 2008, known as the New York City Climate Protection Act (the "GHG reduction goal").[1] The City has also announced a longer-term goal of reducing emissions to 80 percent below 2005 levels by 2050 ("80 by 50"), which was codified by Local Law 66 of 2014, and has published a study evaluating the potential for achieving that goal. More recently, as part of OneNYC, the City announced a more aggressive goal for reducing emissions from building energy to 30 percent below 2005 levels by 2025.

Per the *CEQR Technical Manual*, a project's consistency with the citywide GHG reduction goals discussed above is currently the most appropriate standard by which to evaluate a project under CEQR. The *CEQR Technical Manual* recommends that a GHG consistency assessment be undertaken for certain large development or infrastructure projects. Accordingly, this chapter evaluates the GHG emissions associated with the Project and measures that would be implemented to reduce those emissions, consistent with the City's policy.

There are also several benchmarks for energy efficiency and sustainable design. For example, Envision™[2] is a voluntary system for benchmarking performance and resiliency of infrastructure projects.

METHODOLOGY FOR GHG EMISSIONS ASSESSMENT

Climate change is driven by the collective contributions of diverse individual sources of emissions to global atmospheric GHG concentrations. Identifying potential GHG emissions from a proposed action can help decision makers identify practicable opportunities to reduce GHG emissions and ensure consistency with policies aimed at reducing overall emissions. While the emissions of criteria pollutants are assessed in the context of health-based standards and local impacts, there are no established thresholds for assessing the significance of a project's contribution to climate change. Nonetheless, prudent planning dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them. Therefore, this evaluation discusses GHG emissions associated with the Project and identifies measures that would be implemented and measures that are still under consideration to limit emissions.

POLLUTANTS OF CONCERN

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. The general warming of the Earth's atmosphere caused by this

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[1] Administrative Code of the City of New York, §24-803.

[2] Institute for Sustainable Infrastructure, http://sustainableinfrastructure.org/envision/, accessed June 2, 2017.

phenomenon is known as the "greenhouse effect." The *CEQR Technical Manual* lists six GHGs considered for inclusion in a GHG analysis: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

To present a complete inventory of all GHGs, component emissions are added together and presented as carbon dioxide equivalent (CO_2e) emissions—a unit representing the quantity of each GHG weighted by its effectiveness in warming the planet using CO_2 as a reference. This is achieved by multiplying the quantity of each GHG emitted by the GWP. GWPs account for the lifetime and the radiative forcing[3] of each chemical over a period of 100 years (e.g., CO_2 has a much shorter atmospheric lifetime than SF_6, and therefore has a much lower GWP). The GWPs for the main GHGs are presented in **Table 16-1**.

Table 16-1
Global Warming Potential (GWP) for Major GHGs

Greenhouse Gas	100-year Horizon GWP
Carbon Dioxide (CO2)	1
Methane (CH4)	21
Nitrous Oxide (N2O)	310
Hydrofluorocarbons (HFCs)	140 to 11,700
Perfluorocarbons (PFCs)	6,500 to 9,200
Sulfur Hexafluoride (SF6)	23,900

Note:
The GWPs presented above are based on the Intergovernmental Panel on Climate Change's (IPCC) Second Assessment Report (SAR) to maintain consistency in GHG reporting. The IPCC has since published updated GWP values that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO2. In some instances, if combined emission factors were used from updated modeling tools, some slightly different GWP may have been used for this study. Since the emissions of GHGs other than CO2 represent a very minor component of the emissions, these differences are negligible.
Source: 2014 *CEQR Technical Manual*.

This analysis focuses on CO_2, N_2O, and methane; there are no significant direct or indirect sources of other GHGs associated with the Project.

Carbon dioxide (CO_2) is the primary pollutant of concern from anthropogenic sources. Although not the GHG with the strongest global warming potential (GWP), CO_2 is by far the most abundant. CO_2 is emitted from processes involving fuel combustion (both natural, such as forest fires, and anthropogenic, such as electricity generation); from some industrial processes, such as the manufacture of cement, mineral production, metal production, and the use of petroleum-based products; from volcanic eruptions; and from the decay of organic matter. CO_2 is removed ("sequestered") from the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans. CO_2 is included in any analysis of GHG emissions.

Methane and N_2O also play an important role since the removal processes for these compounds are limited and because they have a relatively high impact on global climate change as compared with an equal quantity of CO_2. Emissions of these compounds, therefore, are included in GHG emissions analyses when the potential for substantial emissions of these gases exists.

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[3] *Radiative forcing* is a measure of the influence a gas has in altering the balance of incoming and outgoing energy in the Earth-atmosphere system and is an index of the importance of the gas as a GHG.

EMISSIONS ASSOCIATED WITH THE PROJECT

Estimates of GHG emissions associated with the Project are based on the applicable methodology presented in the *CEQR Technical Manual*. Sources of GHG emissions from the operation of the Project include off-site emissions associated with the use of electricity (for screens, pumps, HVAC, odor control and site lighting), on-site emissions from boilers~~ and emergency generators~~, and emissions from trucks that would haul away debris and grit removed by the screening and degritting systems after rain events. The Project would not fundamentally change the City's solid waste management system, as the amount of grit and debris would be relatively small. Therefore, as per the *CEQR Technical Manual*, the GHG emissions from solid waste generation, transportation, treatment, and disposal are not analyzed. Project construction activities would also generate GHG emissions. More importantly, the production and transport of construction materials, notably concrete and steel, generates GHG emissions. Emissions from construction activities and materials used in construction are evaluated qualitatively and measures to reduce those emissions would be implemented to the maximum extent practicable. Following publication of the DEIS, the design of the CSO Facilities was refined and now includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. Based on this modification, the design no longer includes emergency generators.

Off-Site Emissions from Electricity Use

The CSO Facilities are expected to be in operation approximately 40 to 50 times during a typical year, and are estimated to require a total of approximately ~~5,806~~5,241 megawatt-hours (MWh) in electricity consumption per year (approximately ~~3,690~~3,125 MWh at the Head End Facility and approximately 2,116 MWh at the Owls Head Facility. The analysis of emissions from energy use (electricity and on-site fuel use) was based on energy consumption projections developed by the Project engineers and emission factors referenced in the 2015 GHG emissions inventory for New York City (approximately ~~293~~ 261 kg CO_2e/MWh).[4] The emission factor used does not account for the likely future increase in the share of electricity generated from renewable resources. The projected emissions from electricity use are therefore conservatively high.

~~*On-Site Emissions from Emergency Generators*~~

~~The Head End Facility would include one 1,100 kilowatt (KW) diesel-fired emergency generator. The Owls Head Facility would include one 650 KW diesel-fired emergency generator. The emission rates are based on a representative maintenance testing schedule and assume each generator would operate at full, 100 percent load for approximately one hour per week for a total of 52 hours per year per generator. The emergency generators would not participate in peak shaving or demand response programs, such as the New York Power Authority (NYPA) or New York Independent Systems Operator, Inc. (NYISO) peak load shaving programs. The analysis of emissions is based on annual diesel fuel use and the emission factor for diesel from New York City GHG inventory (approximately 2.7 kg CO₂e/liter).~~

On Site Emissions from HVAC Systems

The Head End Facility would include ~~three~~ two natural gas-fired boilers, each with a maximum heat input capacity of ~~3~~ 4 million British thermal units per hour (MMBtu/hr). The Owls Head Facility would include ~~three~~ two natural gas-fired boilers, each with a maximum heat input capacity of ~~2~~ 3 MMBtu/hr. Under

[4] ~~The City of~~ New York City Mayor's Office of ~~Long-Term Planning and~~ Sustainability. ~~*Inventory of New York City Greenhouse Gas Emissions in 2015*~~*Aligning New York City with the Paris Climate Agreement*. ~~April~~ September 2017.

annual average operating conditions, ~~two~~ one of the ~~three~~ two boilers at each Facility would operate at 50 percent load with the ~~third~~ second boiler available as a standby unit. In addition, the boilers would only operate during the heating season, and primarily when the Facilities are occupied for maintenance and cleanout. The analysis of emissions is based on annual use of natural gas energy in these boilers and the emission factor from New York City GHG inventory (approximately 50.4 kg CO_2e/GJ).

Mobile Source Emissions

As discussed in Chapter 14, "Transportation," minimal truck traffic and employee vehicle trips would be generated by the Project. The Facilities would only be staffed after heavy rain events. Therefore, mobile source emissions were not further analyzed.

Construction Emissions

A description of construction activities is provided in Chapter 20, "Construction,"~~.~~ Major construction activities that would result in emissions from construction equipment include excavation and demolition, soil removal, and truck transport. In addition, the Project would require construction materials with large embodied emissions (emissions associated with the energy required to produce and transport the materials and emissions generated by the manufacturing process for the materials). A goal of the design is to minimize the size of the above-grade finished Facility which, by extension, will minimize the extent of steel, concrete, and other building materials utilized.

GHG EMISSIONS ASSOCIATED WITH THE PROJECT

The electricity use, on-site fuel consumption, emission factors, and resulting GHG emissions from each site are presented in detail in **Table 16-2**. As shown, the Project would generate approximately ~~715~~ 1,814[5] metric tons of CO_2e per year from electricity use and on-site fuel consumption. Approximately 60 percent of those emissions are associated with the larger Head End Facility. The remaining 40 percent are associated with the Owls Head Facility.

The operational emissions presented above include on-site emissions from fuel consumption as well as emissions associated with the production and delivery of the electricity to be used on-site. The New York City Department of Environmental Protection (DEP) is currently evaluating energy efficiency measures and design elements that would be implemented (see the following section).

[5] Due to an error the DEIS included an incorrect calculation: the DEIS total was 2,415 metric tons of CO_2e per year from electricity use and on-site fuel consumption (correctly shown in Table 16-2 of the DEIS).

Table 16-2
Estimated Annual Operational Emissions

Facility	Source	Annual Consumption	Emission Factor	GHG Emissions (metric tons CO_2e)
Head End	Grid Electricity	~~3,690~~3,125 MWh	~~293~~ 261 kg CO_2e/MWh	~~1,081~~816
	~~Diesel Fuel (for Emergency Generators)~~	~~17,480 liters~~	~~2.7 kg CO_2e/liter~~	~~47~~
	Natural Gas (for Boilers)	~~7,596~~ 5,064 GJ	50.4 kg CO_2e/GJ	~~383~~255
Head End Facility Total				**~~1,511~~1,071**
Owls Head	Grid Electricity	2,116 MWh	~~293~~ 261 kg CO_2e/MWh	~~620~~552
	~~Diesel Fuel (for Emergency Generators)~~	~~10,511 liters~~	~~2.7 kg CO_2e/liter~~	~~28~~
	Natural Gas (for Boilers)	~~5,064~~3,798 GJ	50.4 kg CO_2e/GJ	~~255~~191
Owls Head Facility Total				**~~903~~743**
Total for Both Facilities				**~~2,415~~1,814**

Notes:
Totals may not sum due to rounding.
Per *CEQR Technical Manual* guidance, electricity emissions represent the latest data and not a future year with the Project. Future emissions are expected to be lower.
GJ = gigajoule; CO_2e = carbon dioxide equivalent; MWh = megawatt hour
Sources: ~~The City of New York, Inventory of Climate Change in New York City in 2015~~ New York City Mayor's Office of Sustainability, *Aligning New York City with the Paris Climate Agreement*, ~~Appendix I,~~ September. 2017.

PROJECT ELEMENTS THAT WOULD REDUCE GHG EMISSIONS

The Project would include a number of sustainable design features which would, among other benefits, result in lower GHG emissions. These features and other measures currently under consideration are discussed in this section, addressing the PlaNYC/OneNYC goals. The implementation of the various design measures and features described would be consistent with the City's emissions reduction goal, as defined in the *CEQR Technical Manual*. The Project would use the Envision rating system to evaluate the sustainability of the proposed infrastructure.

ENERGY EFFICIENT DESIGN

The main source of emissions during Project operation would be energy use. Therefore, reducing energy consumption by making the Project more energy efficient is important in reducing GHG emissions from the Project. The following measures are included.

- The Project would strive for a 50 percent reduction in energy use for non-process equipment, consistent with Local Law 31 of 2016.[6]
- Use efficient lighting to the extent allowable by the Public Design Commission (PDC).
- Pumping operations were considered and the Project design minimized the need for pumping and resulting GHG emissions using gravity in-flow and pumped out-flow, with redundant pumps. The CSO Facilities would have a gravity overflow once their capacity is exceeded, discharging into the

[6] http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=2240482&GUID=0A9A548C-E3D9-4057-AEAC-426CA033FBBF

Canal. The Facilities would be "off-line," meaning they would be used for peak flow events, and not during typical wet weather flow events.

- Explore the possibility of reducing HVAC requirements by increasing building insulation.

The Project would also consider measures to reduce water consumption, indirectly reducing energy use and providing other environmental benefits.

- The Project would explore the possibility of avoiding the need for fire suppression.
- The possible use of rain-water harvesting or grey water for tank flushing, interior non-potable plumbing (e.g., toilets) was assessed; however, the volume of rain water was estimated to be too small for this use.

USE CLEAN POWER

The Project evaluated the use of natural gas, a lower carbon fuel, and electricity for the normal operation of the heating, ventilation, and air conditioning (HVAC) systems. A final decision on the means for providing HVAC to the Facilities will be made during detailed design.

The feasibility of providing a roof-mounted photovoltaic system (solar power) was assessed according to the guidelines established in New York City Local Law Laws and DEP's Sustainability policies. A ground-mounted photovoltaic system could be considered as an alternative to roof-mounted panels, assuming this does not interfere with other sustainability objectives for the project.

TRANSIT-ORIENTED DEVELOPMENT AND SUSTAINABLE TRANSPORTATION

The Project would not generate substantial vehicle traffic; therefore, there is limited opportunity to encourage transit-oriented development or make transportation more sustainable.

REDUCE CONSTRUCTION OPERATION EMISSIONS

Construction specifications would include an extensive diesel emissions reduction program, as described in detail in Chapter 20, "Construction," including diesel particle filters for large construction engines and other measures. These measures would reduce particulate matter emissions. While particulate matter is not included in the list of standard GHGs studies have shown that black carbon—a constituent of particulate matter—may play an important role in climate change.[7]

- Construction waste would be diverted from landfills to the extent practicable by separating out materials for reuse and recycling. DEP would aim to reduce the disposal at landfills of non-hazardous waste by 100 percent.
- DEP would explore opportunities/needs to reuse existing materials.
- Options to improve sustainability of soil remediation would be considered, including in-situ treatment.
- A Waste Management Plan would be produced pending the results of the remedial investigation.

[7] Bond, T. C., et al. (2013), Bounding the role of black carbon in the climate system: A scientific assessment, J. Geophys. Res. Atmos., 118, 5380–5552, doi:10.1002/jgrd.50171.

USE MATERIALS WITH LOW CARBON INTENSITY

- To the extent practicable, the Project would use materials with recycled content, including concrete and steel, which have high embodied emissions. A materials study would be prepared to identify opportunities to incorporate recycled material. Considerations requiring additional investigation for using recycled concrete for the tank structure include: tank inundation, groundwater chemistry, and inflow and infiltration. Some cement replacements, such as fly ash and/or slag, may also be used, and concrete content would be optimized to the extent feasible. Recycled steel would most likely be used for most structural steel since the steel available in the region is mostly recycled.
- The Project would, to the extent practiable, incorporate regionally sourced materials, with a target of 60 to 90 percent.

C. CLIMATE CHANGE RESILIENCE

Standards for analysis of the effects of climate change on a proposed project are still being developed and have not yet been defined in CEQR. However, the Waterfront Revitalization Program (WRP)[8] addresses climate change and sea-level rise. The WRP requires consideration of climate change and sea-level rise in planning and design of development within the defined Coastal Zone Boundary (the proposed project is within that zone). As set forth in more detail in the *CEQR Technical Manual*, the provisions of the WRP are applied by the New York City Department of City Planning (DCP) and other city agencies when conducting environmental review. The proposed project's consistency with WRP policies is described in Chapter 2, "Land Use, Zoning, and Public Policy." Moreover, the Project is a major infrastructure undertaking and the Project sites are located within the existing and future projected floodplain. Therefore, the potential effects of global climate change on the Project are considered and measures that would be implemented to improve the Project resilience to climate change are identified. The beneficial effect of the Project on the Gowanus watershed, in terms of resilience to increased precipitation due to climate change is also discussed.

POLICY TO IMPROVE CLIMATE CHANGE RESILIENCE

In recognition of the important roles that the federal, state, and local governments have to play to address adaptation to climate change, climate action task force groups have been working at all government levels to address climate change risks and vulnerability and develop policies for resiliency.

The New York State Climate Action Plan Interim Report[9] identified a number of policy options and actions that could increase the climate change resilience of natural systems, the built environment, and key economic sectors—focusing on agriculture, vulnerable coastal zones, ecosystems, water resources, energy infrastructure, public health, telecommunications and information infrastructure, and transportation. New York State's Community Risk and Resiliency Act (CRRA)[10] requires that applicants for certain State programs demonstrate that they have taken into account future physical climate risks from storm surges, sea-level rise and flooding, and required the Department of Environmental Conservation (NYSDEC) to establish official State sea-level rise projections. In February 2017, NYSDEC adopted a rule (6 NYCRR Part 490) defining the existing projections for use. These projections provide the basis for State adaptation

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[8] City of New York Department of City Planning. *The New York City Waterfront Revitalization Program*. October 30, 2013. Approved by New York State Department of State, February 3, 2016.
[9] NYSERDA. New York State Climate Action Plan Interim Report. November, 2010.
[10] Community Risk and Resiliency Act. Chapter 355, NY Laws of 2014. April 9, 2013. Signed September 22, 2014.

decisions and are available for use by all decision makers. CRRA applies to specific State permitting, funding and regulatory decisions, including smart growth assessments; funding for wastewater treatment plants; siting of hazardous waste facilities; design and construction of petroleum and chemical bulk storage facilities; oil and gas drilling, and State acquisition of open space.

In New York City, the Climate Change Adaptation Task Force, composed of more than 35 New York City and State agencies and other stakeholders is tasked with securing the city's critical infrastructure against rising seas, higher temperatures, and fluctuating water supplies projected to result from climate change. To assist the task force, the New York City Panel on Climate Change (NPCC), has prepared a set of climate change projections for the New York City region[11] which was subsequently updated.[12] [13] The NPCC includes leading climatologists, sea-level rise specialists, adaptation experts, and engineers, as well as representatives from the insurance and legal sectors. The climate change projections include a summary of baseline and projected climate conditions throughout the 21st century including heat waves and cold events, intense precipitation and droughts, sea-level rise, and coastal storm levels and frequency. NPCC projected that sea levels are likely to increase by up to 30 inches by the 2050s and up to 75 inches by the end of the century (more detailed ranges and timescales are available).

The following summarizes the findings most relevant to the Project (more detailed ranges and timescales are available):

- Sea Level Rise and Storm Surge: NPCC projected that sea levels are likely to increase by up to 75 inches by the end of the century. In general, the probability of increased sea levels is characterized as “extremely likely,” but there is uncertainty regarding the probability of the various levels projected and timescale. Intense hurricanes are characterized as “more likely than not” to increase in intensity and/or frequency, and the likelihood of changes in other large storms (“Nor’easters”) are characterized as unknown. Therefore, the projections for future 1-in-100 coastal storm surge levels for the area include only sea-level rise at this time, and do not account for changes in storm frequency.
- Temperature: NPCC projected that annual average temperature is likely to increase by up to 12ºF by the end of the century. In general, the probability of higher temperature is characterized as “extremely likely.” Heatwaves (events with a duration of three or more days with maximum temperatures exceeding 90ºF) are “very likely” to increase in frequency, with up to nine events projected in the high estimate by the 2080s in an average year, up from two events per average year in the baseline, and a duration of up to eight days per event, up from four days in the baseline. The number of days per average year with a maximum temperature exceeding 90ºF in that same timeframe could increase from 18 to 87.
- Precipitation: NPCC projected that annual average precipitation is likely to increase by up to 25 percent by the end of the century. The number of downpours (intense precipitation events shorter than a day and often shorter than an hour) is “very likely” to increase. By the 2080s, downpours of 1 inch or more could increase from an annual average of 13 events in the baseline to 18 events, and downpours of 4 inches or more from an annual average of 0.3 to 0.7 events.

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[11] New York City Panel on Climate Change. *Climate Change Adaptation in New York City: Building a Risk Management Response*. Annals of the New York Academy of Sciences, May 2010.

[12] New York City Panel on Climate Change. *Climate Risk Information 2013: Observations, Climate Change Projections, and Maps*. June 2013.

[13] New York City Panel on Climate Change. *New York City Panel on Climate Change 2015 Report*. Ann. N.Y. Acad. Sci. 1336. 2015.

Building on the climate change projections, the Mayor's Office of Recovery and Resiliency recently developed "Preliminary Climate Resiliency Design Guidelines," to incorporate forward-looking climate data into the design of all City of New York capital projects. The Guidelines aim to provide a consistent methodology for engineers, architects, and planners to design facilities that are resilient to changing climate conditions.

The New York City Green Code Task force has also recommended strategies for addressing climate change resilience in buildings and for improving storm water management.[14] DEP is evaluating adaptive strategies for City water and wastewater infrastructure. The City has already developed a *New York City Green Infrastructure Plan,*[15] and a *Sustainable Stormwater Management Plan.*[16] The goal of the Green Infrastructure Program that resulted in the above mentioned plans is to reduce CSO into the waterways of New York City by managing stormwater from impervious surfaces using green infrastructure (GI) technologies. Many of the strategies discussed in these plans would improve the City's resilience to climate change.

EXISTING CONDITIONS

Both the Head End Site and Owls Head Site are within the current 100-year floodplain (Zone AE; the area that historically had a 1 percent probability of flooding each year; with climate change, the same area is projected to flood more frequently than once in a hundred years). The base flood elevation for Zone AE is 10 feet North American Vertical Datum of 1988 (NAVD88) within the Head End Site and 11 feet NAVD88 within the Owls Head Site. The force main associated with the Owls Head Facility is located partly within the 100-year floodplain, and partly within the 500-year floodplain (the 500-year floodplain is the area that historically had a 0.2 percent probability of flooding each year; with climate change, the same area is projected to flood more frequent than once every 500 years).

With existing precipitation in a typical year, 137 million gallons (MG) of CSO are discharged into the Gowanus Canal from outfall RH-034, and 58 MG are discharged from outfall OH-007. During typical year, approximately 40 to 50 wet weather events result in CSO.

FUTURE WITH THE PROJECT AND DESIGN MEASURES FOR RESILIENCE

As discussed, sea levels are likely to increase by 30 inches by the 2050s and up to 75 inches by the end of the century. As discussed in the Waterfront Revitalization Program (WRP) assessment in Chapter 2, "Land Use, Zoning, and Public Policy," based on NPCC projections, the 100-year flood elevation for the Head End Site may rise to between approximately 10.67 feet NAVD88 (low projection) and approximately 12.5 feet NAVD88 (high projection) by 2050. The 100-year flood elevation for the Owls Head Site may rise to between approximately 11.67 feet NAVD88 (low projection) and approximately 13.5 feet NAVD88 (high projection) by 2050.

The Facilities would be designed in accordance with DEP's November 2013 Crucial Equipment Flood Elevation for Climate Change Memorandum, which requires sensitive and critical equipment be located either 32 inches above the 100-year advisory base flood elevation (ABFE) or at the 500-year ABFE if the cost increase is insignificant. To protect critical infrastructure, the following design measures would be incorporated:

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[14] New York City Green Codes Task Force. *Recommendations to New York City Building Code*. February 2010.
[15] New York City. New York City Green Infrastructure Plan. September 2010.
[16] New York City. Sustainable Stormwater Management Plan. December 2008.

- Head End Facility: the first floor of the Facility's superstructure would be set at an elevation of 13 feet NAVD88, more than 32 inches above the 100-year ABFE. The first floor elevation is not set above the 500-year ABFE (14.8 feet NAVD88) because the cost to meet this requirement would be significant given the grade of the site. All critical electrical equipment would be placed on 22-inch tall equipment pads to put them at an elevation of approximately 15 feet NAVD88, above the 500-year flood elevation.
- Owls Head Facility: the first floor would be set at an elevation of 14 feet NAVD88, and all critical equipment would be placed on 10-inch tall equipment pads to place them above the 500-year flood elevations.

With the proposed elevations, sensitive electrical equipment would be well above the level likely to flood in the future. In addition, incorporation of the following stormwater and flood management measure would be considered to the extent practicable.

- Permeable surfaces (soils/porous pavers) to assist site drainage, if soils are amenable to percolating surface flow. Use of rainwater harvesting system for tank flushing and other uses; the project team would determine what volume is required for tank flush-out.

As a result of the Project, the CSO volume discharged from outfall RH-034 during a typical year is expected to be reduced by approximately 76 percent, from 137 MG to 33 MG. The CSO volume discharged from outfall OH-007 is expected to be reduced by approximately 85 percent, from 58 MG to 9 MG. The Project would directly contribute to more resilient wastewater and stormwater management and contribute to improved water quality. Even with the likely increase in precipitation, the Project would be expected to greatly reduce CSO entering the Gowanus Canal from outfall RH-034 and outfall OH-007.

RESILIENCE BENEFITS OF THE PROJECT

With the Project, the CSO Facilities would store stormwater, until there is sufficient downstream capacity to convey the stored flow to a wastewater treatment plant, thereby reducing CSO. While the design and construction of the Project would reduce the volume of combined sewer overflows entering the Canal, as mandated by the USEPA to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund), the Project will also help address resiliency, as precipitation is projected to increase with climate change. Without the Project and other components of the City's LTCP to address CSO, the number and severity of CSO events would likely increase, worsening water quality. Along with other components of the LTCP, the Project would make the City more resilient to increased precipitation. With increasing temperatures and the number of hot days projected with climate change, odor problems may also worsen in the future. However, the Project would include an odor control system, which would be designed to reduce existing odors and address odor conditions that would likely be exacerbated by climate change.

D. CONCLUSION

The operation of the Project would result in ~~2,415~~ 1,814 metric tons of CO_2e per year. Construction activities and use of construction materials are also associated with GHG emissions. Based on the Project commitment to energy efficiency measures and other sustainability measures under consideration, the Project would be consistent with the City's emissions reduction goals, as defined in the *CEQR Technical Manual*. The Project would also make the Gowanus Canal area more resilient to climate change and would incorporate measures to protect critical infrastructure from flooding. The Project would therefore be consistent with the City's climate change goals. ✷

Chapter 17: Noise

A. INTRODUCTION

This chapter assesses the potential for significant adverse noise impacts from the Project. According to the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, a noise analysis may be required when a project would generate mobile or stationary sources of noise or would introduce new noise receptors in an area with existing high ambient noise levels.

The number of vehicle trips generated by the Project would be lower than the threshold that would require any detailed analysis (see Chapter 14, "Transportation"). Consequently, it is not expected that the Project would generate sufficient traffic to cause a 3 dBA increase in noise levels (i.e., doubling noise passenger-car-equivalents [Noise PCEs]) at any surrounding receptors, which would be considered a significant increase in noise. The Project also does not include above-ground stationary noise sources that could potentially increase noise levels at surrounding receptors. Therefore, existing sensitive receptors are not expected to experience increased noise levels as a result of the Project and an analysis of mobile and stationary noise sources on surrounding receptors is not warranted.

However, since the Project would include publicly accessible open space located in an area with existing high ambient noise levels from vehicular traffic and local industrial activity, this chapter includes a discussion of noise levels at the Project's publicly accessible open space at the Head End Site between Nevins Street and the Gowanus Canal in relation to the CEQR Noise Exposure Guidelines.

B. METHODOLOGY

ACOUSTICS FUNDAMENTALS

Sound is a fluctuation in air pressure. Sound pressure levels (SPLs) are measured in units called "decibels" ("dB"). The character of the sound that we hear (a whistle compared with a French horn, for example) is determined by the speed, or "frequency," at which the air pressure fluctuates, or "oscillates." Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as 1 Hertz ("Hz"). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernable, and therefore more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

"A"-WEIGHTED SOUND LEVEL (DBA)

Noise, in its simplest definition, is unwanted sound. In order to establish a uniform noise measurement that simulates people's perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or "dBA," and it is the descriptor of noise levels most often used for community noise analyses.

As shown in **Table 17-1**, the threshold of human hearing is defined as 0 dBA; quiet conditions (e.g., inside a library) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA are considered noisy, and; levels that approach 130 dBA and higher are considered loud, intrusive, and deafening.

Table 17-1
Common Noise Levels

Sound Source	(dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60-70
Typical Suburban Area	50-60
Quiet Suburban Area at Night	40-50
Typical Rural Area at Night	30-40
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0

Note: A change of 3 dBA is just a noticeable change in SPL. A change of 10 dBA is perceived as a doubling or halving in SPL.
Source: New York City Environmental Quality Review Technical Manual, Table 19-1, 2014.

The dBA scale is logarithmic, meaning that each change of 10 dBA describes a doubling or halving of perceived loudness. Thus, the background noise in an office, at 50 dBA, is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, it must be at least 3 dBA. At 5 dBA, the change will be readily noticeable.

SOUND LEVEL DESCRIPTORS

Because the sound pressure level unit of dBA describes a noise level at just one moment and few noises are constant, other ways of describing noise that fluctuates over extended periods have been developed. One way is to describe the fluctuating sound heard over a specific time period as if it were a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., one hour, denoted by $L_{eq(1)}$, or 24 hours, denoted by $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound.

Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are used to indicate noise levels that are exceeded 1, 10, 50, 90, and x percent of the time, respectively. The relationship between L_{eq} and statistical descriptors depends on how the source of noise fluctuates over a given time period. If the noise fluctuates little, L_{eq} will be approximately L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations occur, the L_{eq} will exceed L_{90}, or the background level by 10 or more decibels. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}.

The one-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines. Therefore, the L_{10} descriptor has been selected as the noise descriptor for the Project.

NOISE STANDARDS AND CRITERIA

CEQR NOISE CRITERIA

The *CEQR Technical Manual* sets external noise exposure standards; these standards are shown in **Table 17-2**. Noise exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable.

Table 17-2
CEQR Noise Exposure Guidelines[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	Ldn ≤ 60 dBA	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Hospital, nursing home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA	60 < Ldn ≤ 65 dBA	$65 < L_{10} \leq 80$ dBA	(I) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn	$L_{10} > 80$ dBA	Ldn ≤ 75 dBA
Residence, residential hotel, or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient public health facility		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)	
Commercial or office		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)	
Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

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

Table Notes:

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

2 Tracts of land where serenity and quiet are extraordinarily important and serve an important public need, and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks, or portions of parks, or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.

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

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

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

C. EXISTING NOISE LEVELS

SELECTION OF NOISE RECEPTOR LOCATIONS

A total of four receptor locations, i.e., sites 1, 2, 6, and 10[1], were used to evaluate noise at the publicly accessible open space on the Head End Site. These locations are detailed below in **Table 17-3** and shown in **Figure 17-1.**

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[1] These receptor sites are a subset of the 11 total sites used for the construction noise impact analysis over the entire study area as presented in Chapter 20, "Construction."

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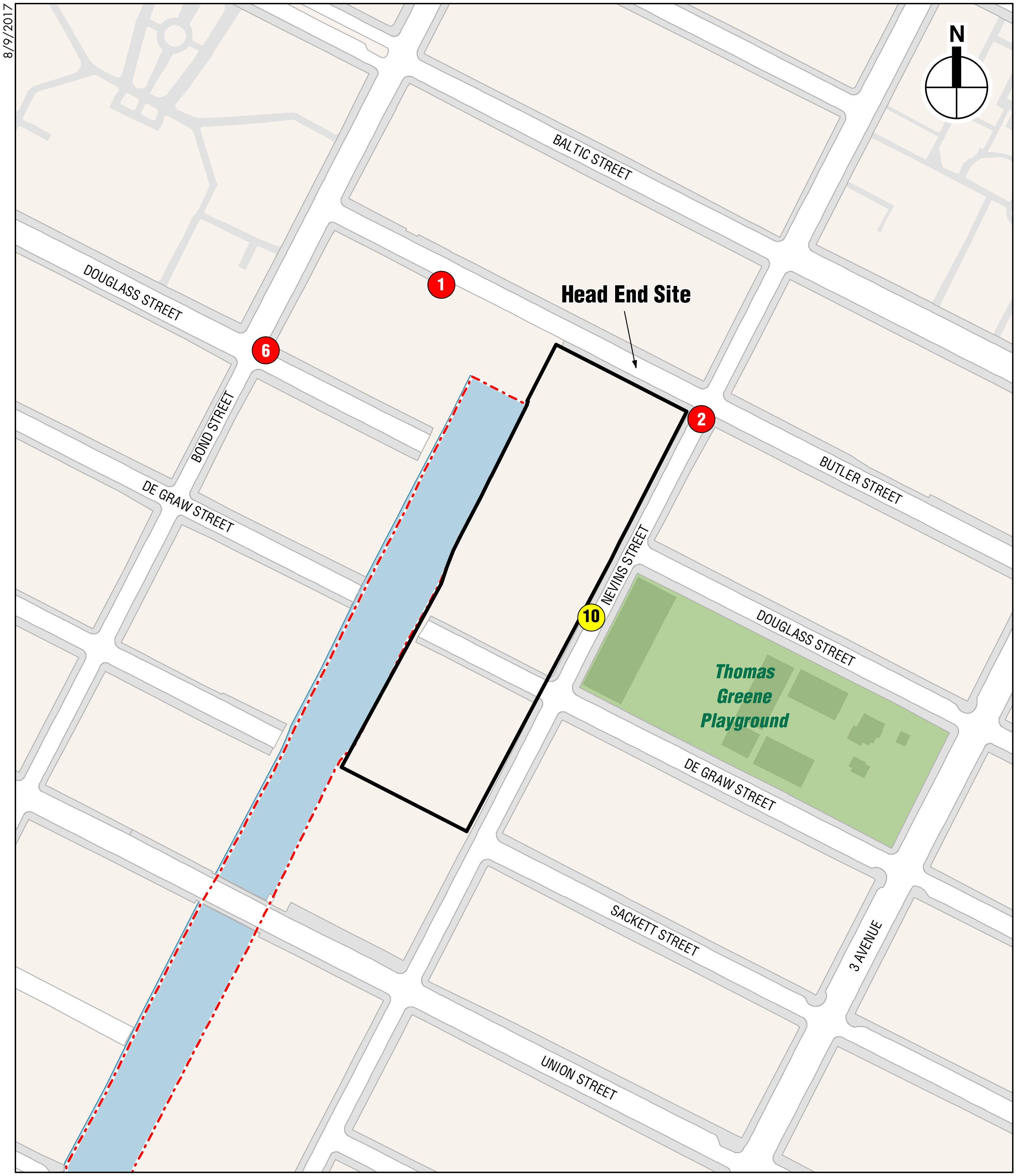


Project Sites

60-minute spot measurements

24-hour continuous measurements

Gowanus Canal

NOTE: These receptor sites are a subset of the 11 total sites used for the construction noise impact analysis presented in Chapter 20, "Construction."

0 200 FEET

Gowanus Canal CSO Facilities

Noise Receptors
Figure 17-1

Table 17-3
Noise Measurement Locations

Noise Receptor	Location	Land Use(s) Represented	Type of Measurements
Spot Noise Monitoring			
1	Butler Street between Nevins Street and Bond Street	Residential	60-minute spot measurement
2	Northeast corner of Nevins Street and Butler Street	Residential	60-minute spot measurement
6	Northeast corner of Douglass Street and Bond Street	Residential	60-minute spot measurement
Continuous Noise Monitoring			
10	Nevins Street between Douglass Street and Degraw Street	Open Space/Recreation	24-hour continuous measurement

The receptor locations were selected due to their proximity to the open space at the Head End Site, which would constitute a newly introduced noise receptor. These four noise receptor locations represent the range of noise levels that occur at the Head End Site, and thus the range of noise levels that can be expected to occur at the open space at the Head End Site.

NOISE MONITORING

A continuous 24-hour noise measurement was performed at site 10 from October 5, 2016 to October 6, 2016. Concurrently, spot noise measurements were conducted for 60 minutes at sites 1 and 6. Existing noise levels were measured at site 2 for 60 minutes on October 19, 2016. Measurements were conducted on week-days between Tuesday and Thursday on weeks when New York City Public Schools were in session as recommended by the *CEQR Technical Manual*.

NOISE MONITORING EQUIPMENT

Measurements were performed using Brüel & Kjær Type 2260, 2250, and 2270 Sound Level Meters (SLMs), Brüel & Kjær Type 4189 ½-inch microphones, and Brüel & Kjær Type 4231 Sound Level Calibrators. The Brüel & Kjær SLMs are Type 1 instruments according to ANSI Standard S1.4-1983 (R2006). The SLMs had a laboratory calibration date within the past one year at the time of use. All noise measurement locations were approximately five feet above grade. The SLMs were calibrated before and after readings with a Brüel & Kjær Type 4231 Sound Level Calibrator using the appropriate adaptors. The data were digitally recorded by the SLMs and displayed at the end of the measurement period in units of dBA. Measured quantities included the L_{eq}, L_1, L_{10}, L_{50}, and L_{90}. Windscreens were used during all sound measurements except for calibration, as directed by the *CEQR Technical Manual*. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

EXISTING NOISE LEVELS AT NOISE RECEPTOR LOCATIONS

MEASURED NOISE LEVELS

The measured existing $L_{eq(1)}$ and $L_{10(1)}$ noise levels at each measurement location are summarized in **Table 17-4**. Maximum existing noise levels are presented in **Table 17-5**. At site 10, the maximum measured noise level over the 24-hour measurement period occurred during the 7 AM hour, which is during the morning rush hour. At sites 1, 2, and 6, 24-hour existing noise levels were calculated by prorating the spot-measured noise levels using the temporal distribution of measured noise levels at site

10. Specifically, for each spot measurement location, the difference in measured L_{eq} values at the spot measurement location versus the continuous measurement location at the same hour was applied to noise levels measured at the continuous measurement location for each hour to develop a 24-hour profile of noise levels.

Table 17-4
Existing Noise Levels (in dBA)

Start Time[1]	Receptor Site 10[2]		Receptor Site 1		Receptor Site 2		Receptor Site 6	
	L_{eq}	L_{10}	L_{eq}	L_{10}	L_{eq}	L_{10}	L_{eq}	L_{10}
1:00 PM	62.1	64.1	57.9	61.4	68.0	64.5	72.5	62.9
2:00 PM	65.5	67.1	61.4	64.4	71.5	67.6	76.0	66.0
3:00 PM	65.1	67.2	61.0	64.4	71.1	67.6	75.6	66.0
4:00 PM	64.1	65.1	60.0	62.4	70.1	65.6	74.6	64.0
5:00 PM	64.1	66.0	60.0	63.2	70.1	66.4	74.6	64.8
6:00 PM	64.6	65.6	60.4[3,4]	62.9[3,4]	70.5	66.0	75.0	64.5
7:00 PM	60.7	63.3	56.6	60.6	66.7[3,4]	63.7[3,4]	71.2[3,4]	62.1[3,4]
8:00 PM	62.3	63.6	58.2	60.9	68.3	64.0	72.8	62.4
9:00 PM	63.4	62.8	59.2	60.1	69.3	63.2	73.8	61.7
10:00 PM	58.1	61.5	54.0	58.8	64.1	61.9	68.6	60.3
11:00 PM	56.5	60.2	52.3	57.4	62.4	60.6	66.9	59.0
12:00 AM	60.2	61.4	56.0	58.7	66.2	61.8	70.7	60.3
1:00 AM	58.2	59.2	54.0	56.5	64.1	59.6	68.6	58.0
2:00 AM	55.6	54.2	51.4	51.4	61.6	54.6	66.1	53.0
3:00 AM	64.1	65.7	60.0	63.0	70.1	66.1	74.6	64.5
4:00 AM	59.3	57.4	55.2	54.7	65.3	57.8	69.8	56.3
5:00 AM	65.6	64.1	61.5	61.4	71.6	64.5	76.1	63.0
6:00 AM	64.7	65.2	60.5	62.5	70.6	65.7	75.1	64.1
7:00 AM	65.6	67.4	61.4	64.7	71.6	67.9	76.1	66.3
8:00 AM	61.8	63.7	57.7	61.0	67.8	64.2	72.3	62.6
9:00 AM	65.0	65.1	60.9	62.4	71.0	65.6	75.5	64.0
10:00 AM	61.2	63.4	57.0	60.7	67.1	63.9	71.6	62.3
11:00 AM	63.8	66.2	59.6	63.5	69.8	66.7	74.3	65.1
12:00 PM	63.2	66.7	59.0	64.0	69.2	67.1	73.7	65.5

Notes:
[1] Field Measurements were performed on October 5, 2016, October 6, 2016, and October 19, 2016.
[2] Existing noise levels at Receptor Site 10 were measured over the entire 24-hour period from 1:00 PM on October 5, 2016 to 1:00 PM on October 6, 2016.
[3] Indicates 60-minute spot measurement start time at Receptor Sites 1, 2, and 6. Existing $L_{eq(1)}$ and $L_{10(1)}$ noise levels at Receptor Sites 1, 2, and 6 during all other hours were determined by prorating the measured $L_{eq(1)}$ based on the 24-hour continuous noise level profile measured at Receptor Site 10.
[4] At Site 1 a 60-minute spot measurement was taken starting at 6:00 PM on October 5, 2016. At Sites 2 and 6, a 60-minute spot measurement was taken starting at 7:00 PM on October 19, 2016 and October 6, 2016, respectively.

Table 17-5
Maximum Existing Noise Levels in dBA

Receptor Site	Location	Maximum $L_{10(1)}$
1	Butler Street between Bond and Nevins	64.7
2	Butler St and Nevins Street	67.9
6	Douglass and Bond	66.3
10	Nevins Street between Douglass Street and Degraw Street	67.4

Note: Maximum $L_{10(1)}$ noise levels at Receptors 1, 2, and 6 are determined based on the 24-hour measured $L_{10(1)}$ noise levels at Receptor 10.

At sites 1, 2, 6, and 10, vehicle traffic on adjacent or nearby roadways was the dominant noise source. Measured levels at sites 1, 2, 6, and 10, were moderate, and reflect the levels expected from vehicular traffic on adjacent roadways. In terms of the CEQR criteria for open spaces, the maximum existing noise levels at these receptor sites are above the noise exposure guideline criteria of 55 dBA $L_{10(1)}$ for open spaces requiring serenity and quiet.

D. FUTURE CONDITIONS IN THE ANALYSIS YEAR

As discussed above, existing noise levels in the vicinity of the publicly accessible open space at the Head End Site are above the 55 dBA $L_{10(1)}$ noise exposure guideline criteria for open spaces requiring serenity and quiet. Noise levels in the future without the Project are expected to be comparable to the existing noise levels at the site of the publicly accessible open space because existing dominant noise sources (i.e. vehicular traffic and industrial businesses) are expected to continue in the future without the Project.

E. PROBABLE IMPACTS OF THE PROJECT

NOISE LEVELS FROM PROJECT GENERATED MOBILE SOURCES

As described above, the number of vehicle trips generated by the Project would be lower than the threshold that would require any detailed analysis (see Chapter 14, "Transportation"). Consequently, it is not expected that the Project would generate sufficient traffic to cause a 3 dBA increase in noise levels (i.e., doubling noise passenger-car-equivalents [Noise PCEs]) at any surrounding receptors, which would be considered a significant increase in noise. Therefore, the Project would not result in any significant adverse noise impacts related to Project-generated mobile sources.

NOISE LEVELS FROM THE PROJECT'S MECHANICAL EQUIPMENT

The building's mechanical systems (i.e., HVAC systems, ~~emergency generators,~~ odor control systems, pumps, etc.) would meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code, the New York City Zoning Resolution [NYCZR] Performance Standards for Manufacturing zones, and the New York City Department of Buildings [DOB] Mechanical Code) and would avoid producing noise levels that would result in any significant increase in ambient noise levels. Further, this equipment would be located either indoors or below grade without line of sight to nearby sensitive receptors. Therefore, the Project would not result in any significant adverse noise impacts related to the building's mechanical equipment.

NOISE LEVELS AT NEWLY INTRODUCED PUBLICLY ACCESSIBLE OPEN SPACE

The Project would include publicly accessible open space located in an area with existing high ambient noise levels from vehicular traffic and local industrial activity. Noise exposure at the newly introduced open space was evaluated according to the *CEQR Technical Manual* Noise Exposure Guidelines (see **Table 17-2**).

As discussed above, existing noise levels in the vicinity of the newly introduced publicly accessible open space are above the 55 dBA $L_{10(1)}$ noise exposure guideline criteria for open spaces requiring serenity and quiet. Noise levels in the future with the Project are expected to be comparable to existing noise levels. Based on the existing noise levels at Receptor Sites 1, 2, 6, and 10, which range from low 50s to high 60s dBA, $L_{10(1)}$ noise levels at the publicly accessible open space are expected to be above 55 dBA, which exceeds the recommended noise level for outdoor areas requiring serenity and quiet contained in the *CEQR Technical Manual* noise exposure guidelines (see **Table 17-2**). However, the dominant source of noise in this area is vehicular traffic and industrial noise from existing businesses operating on Nevins Street, which would continue in the future with the Project. Therefore, although the noise levels in the publicly accessible open space would be above the guideline noise level threshold, these noise levels are comparable to measured existing noise levels in other publicly accessible open spaces in the Gowanus neighborhood, including the Thomas Greene Playground represented by measured values at site 10 and the waterfront public access area (WPAA) at Whole Foods Market (see Chapter 20, “Construction,” for measured values at this open space, measured as site 11). The CEQR guidelines, which provide for a relatively low noise level, intended as a goal for outdoor areas requiring serenity and quiet, such as passive open spaces, are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks. Therefore, the future projected noise levels at the publicly accessible open space would not constitute a significant adverse noise impact.

F. CONCLUSION

The Project would not generate sufficient traffic to cause a 3 dBA increase in noise levels at any surrounding receptors; therefore there are no potential significant noise impacts from mobile sources. Stationary sources used for the building’s mechanical systems and for facility operation (i.e., ~~emergency generators,~~ odor control systems, pumps, etc.) would meet all applicable noise regulations and would avoid producing noise levels that would result in any significant increases in ambient noise levels. Further, this equipment would be located either indoors or below grade without line of sight to nearby sensitive receptors. Therefore, there are no potential significant noise impacts from the Project’s stationary sources on surrounding receptors.

The Project would include publicly accessible open space at the Head End Site between Nevins Street and the Gowanus Canal. Potential noise levels at this open space would exceed the 55 dBA $L_{10(1)}$ CEQR threshold, but would be comparable to measured noise levels at other parks around the Gowanus Canal area and in New York City. Therefore, the Project’s noise levels would not constitute a potential significant adverse noise impact at the publicly accessible open space. ✷

Chapter 18: Public Health

A. INTRODUCTION

Public health is the effort of society to protect and improve the health and well-being of its population. The goal of a public health analysis per the 2014 *City Environmental Quality Review (CEQR) Technical Manual* is to determine whether adverse impacts on public health may occur as a result of a project, and if so, to identify measures to mitigate such effects. The potential effects of the Gowanus Canal CSO Facilities Project (the Project) were considered with regard to effects on the surrounding community.

A public health assessment is warranted for a specific technical area if there is a significant unmitigated adverse impact found in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise. No significant unmitigable changes to air quality, water quality, or hazardous materials are anticipated. As identified in Chapter 20, "Construction," the Project may result in unmitigated construction noise impacts. Therefore, this chapter provides a public health assessment of construction noise.

B. METHODOLOGY

The construction noise analysis presented in Chapter 20, "Construction," was used to identify the extent of the potential temporary noise exposure to the public as a result of the Project. The *CEQR Technical Manual* thresholds for construction noise are based on quality of life considerations and not on public health considerations. The potential temporary noise exposure identified in Chapter 20, "Construction," was evaluated for its potential to impact the health of the affected population by comparing it with the relevant health-based noise criteria as described in the *CEQR Technical Manual*, which identifies chronic exposure to high levels of noise, prolonged exposure to noise levels above 85 dBA (the *CEQR Technical Manual* recommended threshold for potential hearing loss), and episodic and unpredictable exposure to short-term impacts of noise at high decibel levels of concern for Public Health effects.

C. PUBLIC HEALTH ASSESSMENT

Construction of the Project would be divided into three construction phases (CP-1, CP-2, and CP-3). CP-1 includes site preparation, utility relocation, and demolition. CP-2 includes the support of excavation (SOE) construction, site excavation, and construction of the below-grade structures. CP-3 includes the construction of the above grade structures, conveyances, and outfalls.

Construction of the Project would include noise control measures as required by the *New York City Noise Control Code.* These measures include a variety of source (i.e., reducing noise levels at the source or during the most sensitive time periods) and path (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors) controls.

Even with these noise control measures, the analysis presented in Chapter 20, "Construction," found that predicted noise levels due to construction-related activities would result in noise levels at receptors in the vicinity of the project work areas that would constitute potential temporary significant adverse impacts. The locations predicted to experience potential temporary significant adverse impacts under either a five-day per week construction schedule or a seven-day per week construction schedule include 282 and 285 Nevins Street near the Head End Site staging area on Nevins, Douglass, and Sackett Streets (see Figure 20-20).

Although the *CEQR Technical Manual* thresholds for significant adverse impacts are predicted to be exceeded at certain locations during construction, these exceedances would not constitute a significant adverse public health impact. As discussed above, the *CEQR Technical Manual* thresholds for construction noise are based on quality of life considerations and not on public health considerations. An impact found pursuant to a quality of life framework (i.e., significant adverse construction noise impact) does not definitively imply that an impact will exist when the analysis area is evaluated in terms of public health (i.e., significant adverse public health impact).

The predicted temporary noise impacts identified would not constitute chronic exposure to high levels of noise because of the temporary and intermittent nature of construction noise as described in Chapter 20, “Construction.” The maximum predicted construction noise levels (up to the mid-70s dBA) occur over a limited duration during the construction period based on the amount and type of construction work occurring in the construction work areas. Furthermore, construction activity would be limited to a single shift during the day, leaving the remainder of the day and the evening unaffected by construction noise. Since the construction noise would fluctuate in level and would not occur constantly throughout the construction period, which itself is limited in duration, it would not be described as “chronic.” Consequently, construction of the Project would not have the potential to result in chronic exposure to high levels of noise.

The predicted absolute noise levels would be well below the threshold for potential hearing loss of 85 dBA at all analyzed receptors. As shown in Tables 20-37 and 20-40, the maximum predicted levels of noise resulting from construction of the Project would be in the mid-70s dBA.

Based on the predicted noise levels described in Chapter 20, “Construction,” it is also not expected that construction of the Project would result in unpredictable exposure to short-term impacts of noise at high decibel levels. The maximum short-term noise impact resulting from construction of the Project would be in the mid-70s dBA, which would not be uncharacteristic of existing condition noise levels in the Gowanus neighborhood, considering that measured existing noise levels at receptor sites 3, 6, and 8 were also in the mid-70s dBA, as shown in Table 20-33.

Additionally, the predicted noise exposure for the residents of the residential buildings predicted to experience potentially significant adverse construction noise impacts would depend on the amount of façade noise attenuation provided by the buildings. The façade noise attenuation is a factor of the building façade construction as well as whether the building’s windows are able to remain closed. Buildings that have an alternate means of ventilation (e.g., some form of air conditioning) are assumed to be able to maintain a closed-window condition, which results in a higher level of façade noise attenuation. At the existing residential receptors located on Nevins Street near the Head End Site, standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition at this receptor, would be expected to provide approximately 25 dBA window/wall attenuation[1], and interior noise levels at this receptor during construction would be in the ~~high~~ mid-40s dBA, up to approximately ~~5~~2 dBA higher than the 45 dBA threshold recommended for residential areas according to the *CEQR Technical Manual* noise exposure guidelines.

[1] Interior noise levels would be 25 dBA less than exterior noise levels. Standard façade construction using insulated glass windows typically provides approximately 25-30 dBA window/wall attenuation.

As discussed above, construction of the Project would not result in chronic exposure to high levels of noise, prolonged exposure to noise levels above 85 dBA, or episodic and unpredictable exposure to short-term impacts of noise at high decibel levels. Because of the limited magnitude by which interior noise levels would exceed the acceptable threshold at residential receptors and construction noise would not occur during the nighttime when residences are most sensitive to noise, predicted noise levels due to construction of the Project would not constitute unpredictable exposure to short-term impacts of noise at high decibel levels.

Since the area of potential noise impacts is limited and the population exposed to elevated noise levels due to construction is very limited and as described above, the noise would not be chronic, and would not exceed the threshold of short-term, high-decibel levels, the predicted noise resulting from construction of the Project would not constitute a potential significant adverse public health impact. Therefore, the Project would not result in potential significant adverse public health impacts. ✷

Chapter 19: Neighborhood Character

A. INTRODUCTION

This chapter assesses how the Project could affect the neighborhood character of the area around the Head End Site and Owls Head Site along the Gowanus Canal, and determines whether any potential changes to neighborhood character would be considered significant and adverse. As described in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, neighborhood character is an amalgam of various elements that give a neighborhood its distinct "personality" and an assessment of neighborhood character is appropriate when a project would have the potential to result in any significant adverse impacts in the technical areas that relate to neighborhood character such as land use, socioeconomic conditions, open space, historic and cultural resources, urban design and visual resources, shadows, transportation, and noise. Detailed analyses were performed in several of these technical areas and as discussed in Chapter 7, "Historic and Cultural Resources," and Chapter 20, "Construction," the Project has the potential to result in significant adverse impacts in historic resources and construction noise. Therefore, an assessment of neighborhood character is warranted.

This chapter describes the defining features of the existing neighborhood character in the area near the Head End Site and the Owls Head Site along the Gowanus Canal, and considers the potential effects of the Project on these defining features.

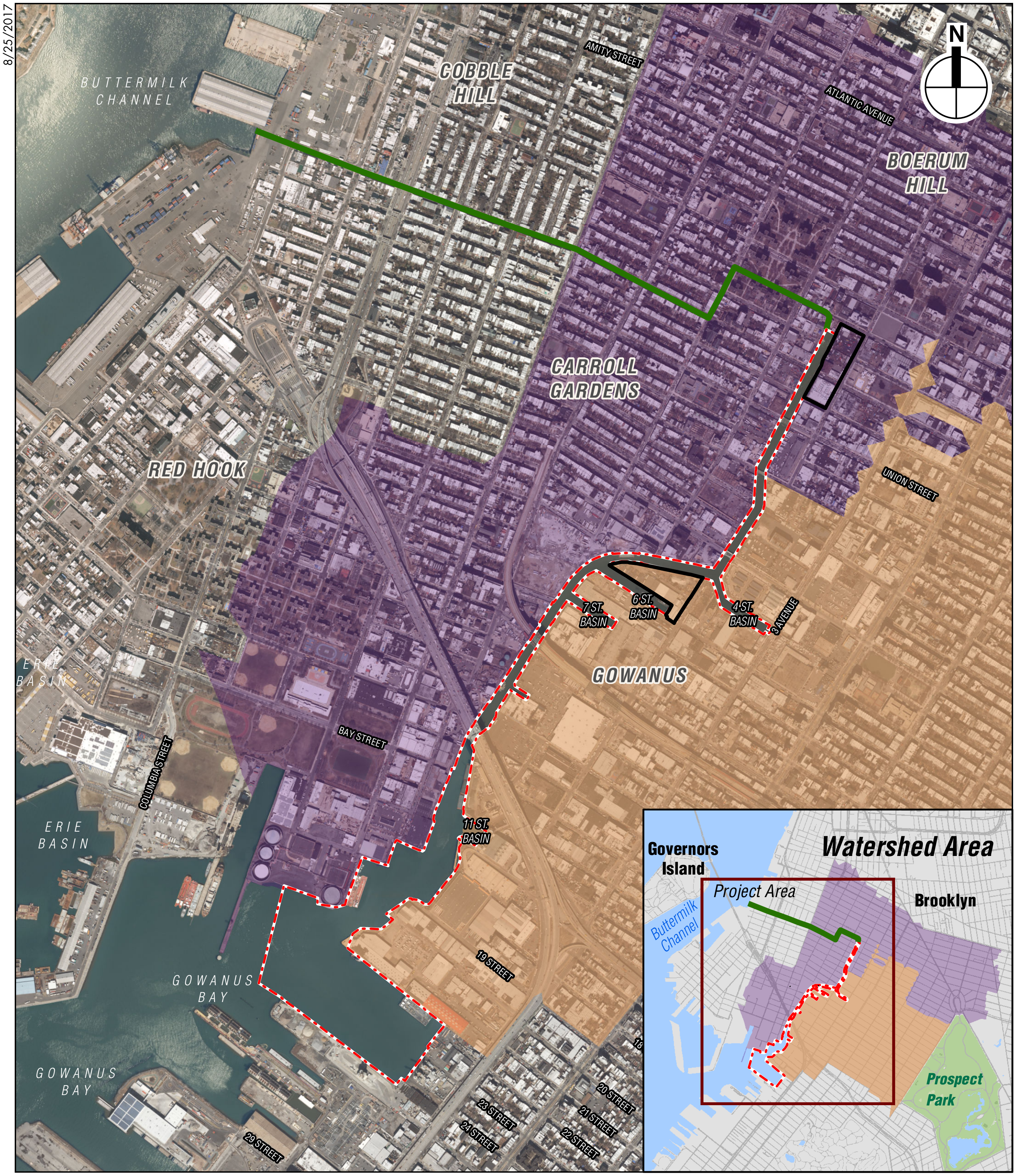
B. METHODOLOGY

A preliminary assessment of neighborhood character was performed to determine whether changes expected in other technical areas may affect an element that contributes to neighborhood character. The assessment identifies the defining features of the neighborhood and assesses whether the Project has the potential to affect these defining features either through the potential for significant adverse impacts or a combination of moderate effects. A moderate effect is generally defined as an effect considered reasonably close to a significant adverse impact threshold for a particular technical area. Therefore, even if a project does not have the potential to result in a significant adverse impact on neighborhood character in a certain technical area, the project may result in a combination of moderate effects to several elements that, when considered together, may cumulatively alter an area's neighborhood character, warranting further analysis. Neighborhood character effects are rare, and only under unusual circumstances would a combination of moderate effects to the neighborhood result in an impact to neighborhood character, in the absence of an impact in any of the relevant technical areas.

STUDY AREA

The Gowanus Canal is surrounded by a mix of residential, commercial, and industrial uses. The residential areas surrounding the Canal include the neighborhoods of Gowanus, Park Slope, Cobble Hill, Carroll Gardens, and Red Hook.

There are two distinct Project Sites (see **Figures 19-1 and 19-2**). The Head End Site includes three properties totaling approximately 3.6 acres. The Head End Facility would be constructed on two of the



Project Sites

Gowanus Canal

Gowanus Canal Flushing Tunnel

Red Hook Sewershed*

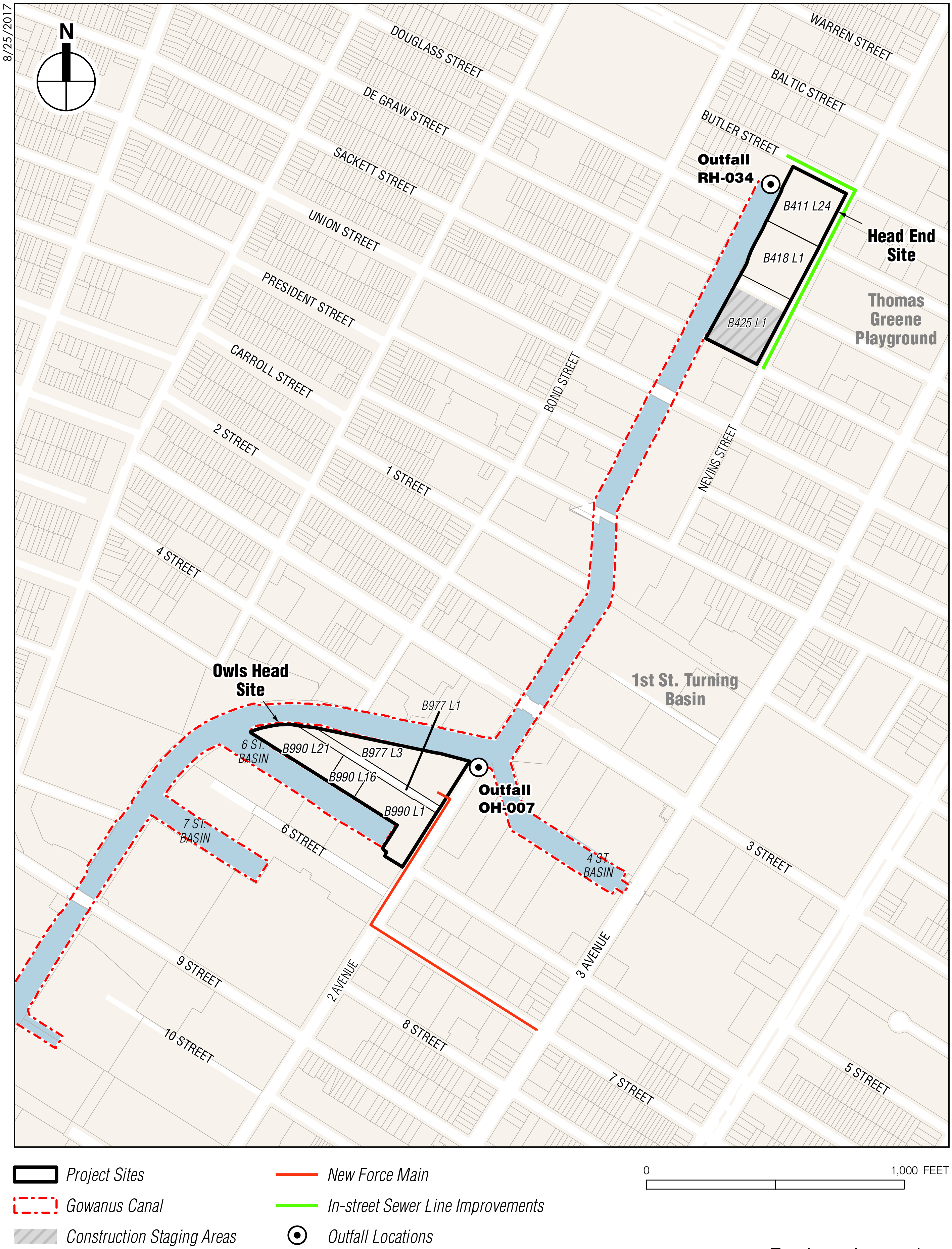
Owls Head Sewershed*

0 1,000 FEET

* Sewershed areas indicate the portions of the Gowanus Canal Watershed served by each WWTP

Gowanus Canal CSO Facilities

Project Area:
Gowanus Canal
Figure 19-1



Gowanus Canal CSO Facilities

Project Location
Figure 19-2

properties on the eastern side of the Canal between Degraw and Butler Streets. The third property on the Head End Site is south of Degraw Street and is intended to be used as a construction staging area. The Owls Head Site includes five properties located along the southern side of the Canal as it bends toward the west near the 4th Street turning basin, totaling approximately 4.1 acres; the five properties would be used for the Owls Head Facility and construction staging areas.

As stated in the *CEQR Technical Manual*, the study area for a preliminary analysis of neighborhood character is typically consistent with the study areas in the relevant technical areas that contribute to the defining elements of the neighborhood. Therefore, the study areas for this analysis are varied. For example, a 600-foot study area around each project site was analyzed for land use, zoning, and public policy. The Head End Study Area is roughly bounded by Warren Street to the north, 3rd Avenue to the east, President Street to the south, and Bond Street to the west; the Owls Head Study Area is roughly bounded by 2nd Street to the north, 3rd Avenue to the east, 9th Street to the south, and between Hoyt and Smith Streets to the west, shown on Figure 2-2 in Chapter 2, “Land Use, Zoning, and Public Policy.” A ½-mile study area around each project site was analyzed for socioeconomics (which includes Census Tracts 71, 75, 77, 119, 121, and 127, roughly bounded by the Brooklyn Queens Expressway to the south, Court Street to the west, Bergen Street to the north, and 4th Avenue to the east), shown on Figure 3-1 in Chapter 3, “Socioeconomic Conditions.” Study areas associated with the shadows, noise, and construction analyses fell within these boundaries with receptor locations specific to the analyses.

C. PRELIMINARY ASSESSMENT

DEFINING FEATURES

The neighborhood character of the Project’s area is defined by a few key components: the neighborhood’s land uses, socioeconomic character, and history, which are all related to manufacturing and commercial activities around the Canal, as well as the public open spaces and recreational resources in the area, such as the Thomas Greene Playground. The Canal has been a defining feature of the area; following its construction in the 1860s, the Canal quickly became one of the nation’s busiest industrial waterways, serving heavy industries in the area. Historically, properties along the waterfront were primarily commercial and industrial; currently, the properties fronting on the Canal remain largely industrial and light-manufacturing. The Canal also became a location for sewer infrastructure; major sewer infrastructure in the area of the Canal includes the New York City Department of Environmental Protection (DEP) Gowanus Wastewater Pumping Station, located immediately to the west of the Head End Site along Butler Street, and the Gowanus Canal Flushing Tunnel, which discharges to the Canal opposite the Head End Site.

The area surrounding the Head End Site primarily contains commercial, light-industrial, and residential uses. In particular, the properties fronting the Canal to the south of the Head End Site and on the western side of the Canal consist mainly of one- to three-story distribution and warehouse buildings, as well as open storage yards, parking areas for trucks and buses, and artists’ workspaces and studios. In addition, the Thomas Greene Playground, a major open space and recreational resource, is located immediately east of the Head End Site (discussed further below).

The area surrounding the Owls Head Site primarily contains manufacturing, light-industrial and commercial uses in one- to three-story buildings located on both sides of the Canal. This area is farther from residential land uses than the area surrounding the Head End Site (the only existing residential building within the area is a one-story, single-family home on 4th Street west of the Canal). Notable features in the this area include an office building adjacent to the Owls Head Site, opposite 2nd Avenue, which contains facilities for the New York State Department of Corrections (DOC). Recently, the area has experienced more commercial development, in particular the Whole Foods Market north of the 4th Street turning basin along 3rd Avenue.

As detailed in Chapter 7, “Historic and Cultural Resources,” there are historic and cultural resources within proximity to the Canal that reflect the area’s historic industrial development and contribute to the area’s defining features. In particular, the Gowanus Canal Historic District (State and National Register [S/NR]-eligible) encompasses 53 blocks around the Canal, including the Head End and Owls Head Sites. In the National Register of Historic Places Registration (Nomination) Form prepared by the New York State Historic Preservation Office (SHPO), the Historic District was identified as significant in the areas of architecture, engineering, transportation and commerce.[1] In particular, near the Head End Site and Owls Head Site, the cribbing and bulkheads of the Gowanus Canal are considered S/NR-eligible historic resources. The cribbing and bulkheads are present along the length of the Canal within this area and within a distance of approximately 25 feet from the Canal’s bulkhead.

On the Head End Site, the buildings at 242 Nevins Street, 270 Nevins Street, and 234 Butler Street contribute to the significance of the S/NR-eligible Gowanus Canal Historic District. Other historic resources near the Head End Site include several individually S/NR-eligible architectural resources: the Gowanus Canal Pumping Station and Gate House, 190 Butler Street, the ASPCA Memorial Building (233 Butler Street), the Former R.G. Dunn and Company Building (255 Butler Street), and the Union Street Bridge.

The Owls Head Site contains utilitarian structures that are not distinguished architecturally and do not appear to possess any particular historical significance or significant association with the Canal. In their letter dated July 3, 2017, SHPO concurred that the buildings on the Owls Head site are Non-Contributing to the S/NR-eligible Gowanus Canal Historic District. Other historic resources near the Owls Head Site include similar historic infrastructure and industrial buildings: the Third Street Bridge, the Leonhard Michel Brewing Company Complex at 409-411 Bond Street, and the Kentile Building Complex located at 83-125 9th Street (all S/NR-eligible).

As in any neighborhood, the area’s character is partly defined by its design (the totality of components that contribute to a pedestrian’s experience of public space). In this case, the area’s urban design reflects its primarily industrial built environment, in particular, its low-density buildings and open yards, with limited visual resources, as described in Chapter 8, “Urban Design and Visual Resources.”

Similarly, the area is defined by its socioeconomic character, which is a reflection of its historic industrial economy. As noted in Chapter 3, “Socioeconomic Conditions,” there are significantly higher levels of employment within the area in the Construction, Transportation and Warehousing, and Wholesale Trade industry sectors as compared with Brooklyn and New York City overall. The Construction sector represents 10 percent of total study area private-sector employment, whereas in Brooklyn and New York City, the sector represents 4 to 5 percent of private-sector employment. The Transportation and Warehousing sector represents 8 percent of total study area private-sector employment, whereas in

[1] As discussed in Chapter 7, “Historic and Cultural Resources,” the Gowanus Canal Historic District was proposed for listing on the S/NR by SHPO in 2014; however, in response to community comments, SHPO decided not to pursue the listing of the historic district, the S/NR listing did not go forward, and SHPO subsequently made a determination of S/NR-eligibility for the Gowanus Canal Historic District. The Draft National Register Nomination Form for the historic district, which provides information regarding the history and construction dates of the buildings within the historic district boundaries and identifies certain buildings as Non-Contributing to the significance of the proposed historic district, serves as the basis for the identification and discussion of historic architectural resources.

Brooklyn and in New York City, the sector represents 3 percent of private-sector employment. Employment in Wholesale Trade represents 7 percent of study area employment as compared with 4 percent in Brooklyn and in New York City.

The area's character is also defined by its open space and recreational areas. In particular, the Thomas Greene Playground, a public open space operated by the New York City Department of Parks and Recreation (NYC Parks), is a significant resource located east of the Head End Site between Douglass and Degraw Streets. The Thomas Greene Playground contains handball courts, a public pool (the Douglass and Degraw Pool), a comfort station, and changing rooms, a paved area with basketball courts, a playground, and seating areas. In addition, the Gowanus Canal itself is a recreational resource that is used by the surrounding community for active recreational activities such as fishing and boating.

ASSESSMENT OF THE POTENTIAL TO AFFECT THE DEFINING FEATURES OF THE NEIGHBORHOOD

Using the findings from the respective chapters of this ~~D~~FEIS, the assessment identifies whether the Project would result in any significant adverse impacts or moderate adverse effects (effects considered reasonably close to a significant adverse impact threshold, as described above) and whether any such changes would have the potential to affect the defining features of neighborhood character. The assessment focuses on the major characteristics of the neighborhood and their relative contribution to the area's overall character (described above), and how these characteristics would potentially be affected by the Project. Specifically, as discussed above, the area surrounding the Head End Site and the Owls Head Site are primarily defined by their industrial and commercial land uses, socioeconomic character, industrial historic resources that developed around the Canal, and the public open spaces and recreational resources. The potential for significant adverse impacts to these neighborhood features are discussed below.

LAND USE

As described in Chapter 2, "Land Use, Zoning, and Public Policy," the two combined sewer overflow (CSO) Facilities would be part of the extensive sewer infrastructure system present in the area around the Canal—which includes pumping stations, regulators, CSO outfalls, and the DEP Gowanus Wastewater Pumping Station immediately to the west of the Head End Site—and would be compatible with the existing sewer infrastructure in the area. Similarly, the Facilities would be compatible with the other uses within the area, including distribution/warehouse, light-industrial, and commercial and residential. In addition, use of the property on the Head End Site as a temporary construction staging area would not pose conflicts to nearby land uses, as it would not result in any permanent facilities on the construction staging area.

Operation of the Head End Facility would not have a negative effect on the adjacent Thomas Greene Playground. Although the design of the Facility is ongoing, it would result in the addition of some form of publicly accessible open space along the Canal, and potentially additional public access areas and/or public amenities that could help stitch together the new public open space along the Canal and the Thomas Greene Playground across Nevins Street. Similarly, operation of the Owls Head Facility would not have an adverse effect on adjacent properties, which generally contain manufacturing, light-industrial, and commercial uses. In addition, construction of the Project would not affect land use conditions and patterns in the area, as construction activities would be temporary in nature and would largely take place within the Project Sites or within portions of sidewalk and streets immediately adjacent to the Project Sites. Therefore, the Project would be compatible with existing land uses in the area, and would not have the potential to affect the land uses which are a defining feature of the area's neighborhood character.

HISTORIC AND CULTURAL RESOURCES

As discussed in Chapter 7, “Historic and Cultural Resources,” the Owls Head Facility would not have any indirect, contextual impacts on architectural resources in the study area as it would result in a low-rise industrial facility and paved area similar to other properties in the S/NR-eligible Gowanus Canal Historic District. The Head End Site and Owls Head Site are sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature. If these resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact on archaeological resources. As the Gowanus Canal bulkheads are S/NR-eligible, modification of the bulkhead at the Head End Site would result in a significant adverse impact. As discussed in Chapter 7, “Historic and Cultural Resources,” consultation with SHPO and LPC is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites and appropriate mitigation, which may include archaeological monitoring.

On the Head End Site, DEP has determined that demolition of the buildings at 242-244 Nevins Street, 270 Nevins Street, and the Gowanus Station at 234 Butler Street and associated one-story sections would constitute a potential significant adverse impact to architectural resources on the Head End Site and to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. As the Project is mandated by the U.S. Environmental Protection Agency (USEPA) to satisfy remediation objectives under CERCLA (and would require permits from the U.S. Army Corps of Engineers [USACE] or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act of 1966. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA in consultation with SHPO and the City, will seek ways to minimize or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition and is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, and as discussed above, it is expected that DEP, under USEPA’s supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would incorporate some salvageable significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

~~Therefore, DEP is evaluating the potential of retaining all or portions of the buildings to avoid or minimize the adverse impact that would occur through demolition. If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, DEP would document the buildings as per recordation standards determined in consultation with SHPO, which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available. In addition, DEP would explore the potential to salvage any significant architectural features of the buildings for reuse at the Head End Site or at another location.~~

Two individually S/NR-eligible architectural resources are located within 90 feet of the Head End Site: the ASPCA Memorial Building and the Former R.G. Dunn and Company Building. To avoid any inadvertent construction-related impacts to these resources during project construction, a Construction Protection Plan (CPP) would be prepared and implemented in consultation with SHPO and LPC and in conformance with the New York City Department of Building's (DOB) Technical Policy and Procedure Notice (TPPN) #10/88. In addition, other properties located within the S/NR-eligible Gowanus Canal Historic District are located within 90 feet of the Head End Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken between DEP and SHPO to determine what protection measures may be needed for these properties during construction of the Project. As long as appropriate mitigation measures are in place, there would be no adverse impacts to neighborhood character resulting from construction of the Project on the ASPCA Memorial Building, the Former R.G. Dunn Company Building, or other historic resources in the area of the Head End Site.

The buildings on the Owls Head Site are utilitarian structures that are not distinguished architecturally and do not contribute to the significance of the 2014 S/NR-eligible Gowanus Canal Historic District. Therefore, demolition of the buildings on the Owls Head Site would have no significant adverse impacts on architectural resources. As with the Head End Site, consultation is being undertaken between DEP and SHPO to determine what protection measures may be needed for other properties within the Gowanus Canal Historic District that are located within 90 feet of the Owls Head Site.

In addition, both the Head End Facility and the Owls Head Facility are being designed to be compatible with the neighborhood context and to the extent possible would integrate architectural features with ongoing community planning and development. The design will use, to the extent feasible and practicable, building massings and material palettes, colors, and textures that are sensitive to the area's primarily industrial architectural character. With the mitigation measures described above in place, there would be no neighborhood character impacts due to significant adverse effects to historic and cultural resources.

URBAN DESIGN AND VISUAL RESOURCES

The pedestrian experience in certain areas along the Canal close to the Head End Facility and the Owls Head Facility would be enhanced with the new project components. Landscaping at both sites and potential public access areas at the Head End Site would create new views of the Canal from nearby areas by removing existing structures and manufacturing facilities, thereby improving westward views from the adjacent Thomas Greene Playground. As described in Chapter 8, "Urban Design and Visual Resources," the Project would comply with applicable zoning regulations regarding bulk and built form, and would result in physical and visual changes consistent with zoning regulations along the Canal. Therefore, the Project would not result in a significant adverse impact on urban design or visual resources, or the pedestrian's experience of these characteristics of the built and natural environment, and would not negatively affect the urban design elements that contribute to the area's neighborhood character.

SOCIOECONOMIC CONDITIONS

As discussed in Chapter 3, "Socioeconomic Conditions," there are 19 businesses, predominantly within the Construction, Transportation and Warehousing, and Other Services Sector—Automotive Repair and Maintenance industry sectors, that could be directly displaced by the Project. These 19 businesses do not provide products or services essential to the local economy that would no longer be available in their "trade areas" to local residents or businesses due to the difficulty of either relocating the businesses or establishing new, comparable businesses. These 19 businesses are also not in a category of businesses or institutions that may be the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it. The single-largest potentially displaced business, which also has the most employees, is Eastern Effects—a Motion Picture and Sound Recording company occupying the entirety of Lot 1 on Block 425 (the location of the construction staging area for the Head End Site). Eastern Effects is estimated to employ 35 workers. However, displacing the studio space would not significantly affect business conditions in the Motion Picture and Sound Recording Industry Sector in the area. Motion picture businesses are located throughout the City (e.g., in Midtown Manhattan, in the Brooklyn Navy Yard, in the Kaufman and Silvercup Studios in Astoria, Queens, and in East New York). Also, many of the smaller businesses in the sector that are sub-contractors to larger production facilities typically offer their services to multiple facilities/studios in different locations. Further, for supporting businesses in the area such as editors and other post-production businesses, it is not necessary to be in close proximity to the production site since files can be shared digitally.

With the Project, the socioeconomic character of the area, which is largely defined by the presence of businesses in the Construction, Transportation and Warehousing, and Wholesale Trade sectors, would remain intact. The displacement of these 19 businesses, including Eastern Effects, would not significantly affect business conditions in any industry or any category of business within or outside the study area. In addition, construction of the Project would not result in any significant adverse impacts on socioeconomic conditions; lane and/or sidewalk closures needed to accommodate construction of the Project would not obstruct entrances to any existing businesses, and businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. In addition, Maintenance and Protection of Traffic (MPT) plans would be developed and implemented to ensure that access to existing businesses near the Project Sites would be maintained throughout the construction period. Therefore, the Project would not result in significant adverse impacts to socioeconomic conditions that would affect the area's neighborhood character.

OPEN SPACE

Publicly accessible open spaces and recreational resources, including the Canal itself, are considered defining features of the neighborhood. The Project sites and construction staging areas do not currently contain any publically accessible open spaces; therefore, the Project would not displace any open space. Further, construction and operation of the CSO Facilities would not result in any significant adverse impacts from odor, air quality, noise, or shadows on any publicly accessible open spaces.

As discussed in Chapter 6, "Shadows," the Project would not result in any significant adverse shadow impacts to the Canal or any other nearby open spaces. As described in the detailed shadows analysis, some seasonal incremental shadow would be cast on the Canal; however, the limited areas of incremental shadows would not substantially affect recreational use of the Canal, as large areas of the Canal adjacent to the area affected by incremental shadows would continue to receive direct sunlight and be available to users. Similarly, the Head End Facility and Owls Head Facility would not result in any shadows on adjacent open spaces (the Thomas Greene Playground and the Whole Foods Market open space, respectively).

As discussed in the construction noise analysis in Chapter 20, "Construction," although noise levels would increase during periods of the Project's construction, publicly accessible open spaces, including the Canal, would remain usable during construction. At open space receptors near the construction work areas, the total noise levels during the most intensive construction activities would be noticeable and potentially intrusive at times; however, the noise levels would be comparable to the measured existing weekday noise levels in the Gowanus neighborhood, and therefore the total noise levels would be in the range considered typical for the area. Therefore, the predicted levels of construction noise were not determined to rise to the level of a significant adverse impact at any open space receptors.

Overall, with the Project, nearby open spaces would continue to function in their current state. As a result there would be no impacts to recreational use or open spaces, and these elements of the area's neighborhood character would not be significantly impacted.

CONSIDERATION OF MODERATE EFFECTS

As noted above, even if a project does not have the potential to result in a significant adverse impact on neighborhood character in a certain technical area, the project may result in a combination of moderate effects (effects considered reasonably close to a significant adverse impact threshold) to several elements that may cumulatively affect an area's neighborhood character. The Project would not result in adverse effects that are reasonably close to significant adverse impacts in the areas of land use, zoning, and public policy; socioeconomic conditions; open space; shadows; urban design and visual resources; transportation; or operational noise. Although the Project would have potential significant adverse effects on historic and cultural resources, these effects would be mitigated with appropriate measures (see Chapter 7, "Historic and Cultural Resources" and Chapter 23, "Mitigation"). Similarly, while the Project would result in elevated noise levels affecting nearby sensitive uses, including nearby residences, during periods of construction (discussed in Chapter 20, "Construction"), the potential temporary significant adverse noise impacts would be limited to the construction period and would only occur at a limited number of existing residences on two distinct blocks adjacent to the construction work areas. Potential temporary significant adverse noise impacts at these receptors would occur intermittently over the course of approximately 48 months of the most noise-intensive construction period.~~ Although the intensity of work and required number of construction vehicles traveling to and from the site would be less during the remaining phases of construction, potential temporary significant adverse noise impacts at these receptors may still occur throughout the entire duration of project construction.~~ However, these potential temporary significant adverse construction noise impacts would be limited to the areas near the construction area, and the Project would not result in widespread noise impacts affecting the area's neighborhood character. Therefore, in consideration of the limited geographic area of the potential temporary significant adverse construction noise impacts, in combination these effects would not cumulatively affect the character of the area near the Project Sites.

D. CONCLUSION

As discussed above, the defining features of the neighborhood around the Project Sites include its primarily industrial and commercial land uses, socioeconomic character, and historic resources, all of which are influenced by the historic presence of the Canal. The area's character is also partly defined by its public open spaces, such as the Thomas Greene Playground, and the recreational use of the Canal. This preliminary assessment did not identify any potentially significant adverse impacts to neighborhood character either singularly, or in combination with potential impacts in other relevant technical areas. Although the Project would result in a potential significant adverse impact to historic resources, this impact would be mitigated, ensuring that there would be no potential impacts on the area's historic neighborhood character. Similarly, although the Project would result in potential temporary significant adverse noise impacts during construction, these impacts would be limited to the construction period and would only occur at receptors immediately adjacent to the construction areas; therefore, they would not result in widespread noise impacts affecting the area's neighborhood character, and a detailed neighborhood character analysis is not necessary.

With the Project, the defining features of the neighborhood would remain unaffected, including its mix of land uses which contribute to the area's primarily industrial character. Furthermore, the Project would include elements that enhance the pedestrian experience and the character of the area, including publicly accessible elements at the Head End Site and certain landscaping elements at the Owls Head Site. Overall, the Head End and Owls Head Facilities would be consistent with the existing water and sewer infrastructure in the neighborhood, and would not detract from any of the neighborhood's defining features. ✷

Chapter 20: Construction

A. INTRODUCTION

The Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) would result in the construction and operation of CSO facilities at two sites along the Gowanus Canal. This chapter summarizes the construction program for the Project and assesses the potential for significant adverse impacts during construction in accordance with the 2014 *City Environmental Quality Review (CEQR) Technical Manual*.

The chapter provides a discussion of the activities likely to occur during construction, the types of equipment that are likely to be used, the construction schedule, the anticipated construction logistics (i.e., equipment operation and staging area locations), and construction workers and truck delivery estimates. Based on this information, potential impacts on transportation, air quality, noise and vibration, land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, natural resources, hazardous materials, and water and sewer infrastructure from construction activities are analyzed.

Construction of the Head End Facility is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1). Construction of the Owls Head Facility is proposed to be located at 2 2nd Avenue (Block 977, Lot 3), 110 5th Street (Block 990, Lot 21), 122 5th Street (Block 990, Lot 16), 22 2nd Avenue (Block 990, Lot 1), and 5th Street (Block 977, Lot 1), with portions of this area used for construction staging (see Figure 1-2). The site for the Owls Head Facility contains a New York City Department of Sanitation (DSNY) facility that includes a road salt storage yard and space for storage of snow plows, located on Block 977, Lot 3. During construction of the Owls Head Site the DSNY's road salt and plow storage may be relocated within a portion of the site. In addition, the DSNY-controlled portion of the Owls Head Site is also used periodically by a local non-profit environmental group, the Gowanus Canal Conservancy (GCC), for environmental education and stewardship events, including composting operations. While access to GCC activities may be displaced during construction, following construction of the Owls Head Facility, access for these activities would be restored.

PROJECT SITES

Head End Site

The Head End Site includes three properties totaling approximately 3.6 acres (see Figure 2-2a). Two of the properties are on the eastern side of the Canal between Degraw and Butler Streets (Block 411, Lot 24 and Block 418, Lot 1). The Head End Facility would be constructed on these two properties, which are currently developed with several one- and two-story buildings used by manufacturing and auto-related businesses, including automobile repair shops and electrical and plumbing contractors. These buildings are generally located along the street frontages of the properties (along Nevins and Degraw Streets) while the interior of the properties face the Canal and generally contain open vehicle and equipment storage yards (accessed by a driveway on Butler Street and two driveways on Nevins Street). A sewer line runs through the properties leading to a CSO outfall on the Canal (outfall RH-033). This sewer line extends under a mapped but unbuilt portion of Douglass Street.

The third property on the Head End Site is south of Degraw Street (Block 425, Lot 1) and is intended to be used as a construction staging area. This property is developed with a one-story former manufacturing building that has been repurposed into a film production studio.

Owls Head Site

The Owls Head Site includes five properties totaling approximately 4.1 acres (see Figure 2-2b) that would be used for the Owls Head Facility and construction staging areas. The DSNY property (Block 977, Lot 3), is located along the southern side of the Canal as it bends toward the west near the 4th Street turning basin. The property is primarily a storage yard for road salt and a composting area, and contains a recently constructed shed. South of the DSNY lot, the site consists of four properties: the adjacent property (Block 977, Lot 1) is a portion of 5th Street which leads to a vehicle storage area along the Canal (Block 990, Lot 21); the street is a mapped City street that is controlled by the private owner of the vehicle storage property and used as a private street. The other properties (Block 990, Lots 1 and 16) are located between 5th Street and the 6th Street turning basin, and contain one-story buildings used by automobile repair and shipping businesses.

B. DESCRIPTION OF CONSTRUCTION PROGRAM

CONSTRUCTION PHASES

The construction of the Head End Facility and the Owls Head Facility would consist of three primary construction phases referred to as CP-1, CP-2, and CP-3 to facilitate the sequence of work and the construction activities by others.[1] CP-1 comprises site preparation, utility relocation, and demolition; CP-2 comprises support of excavation (SOE) construction, site excavation, and below-grade structures construction; and CP-3 comprises above-grade structures, conveyances, and outfalls construction (see **Figure 20-1**). The activities anticipated to occur in these construction phases are applicable for both Project Sites unless otherwise stated.

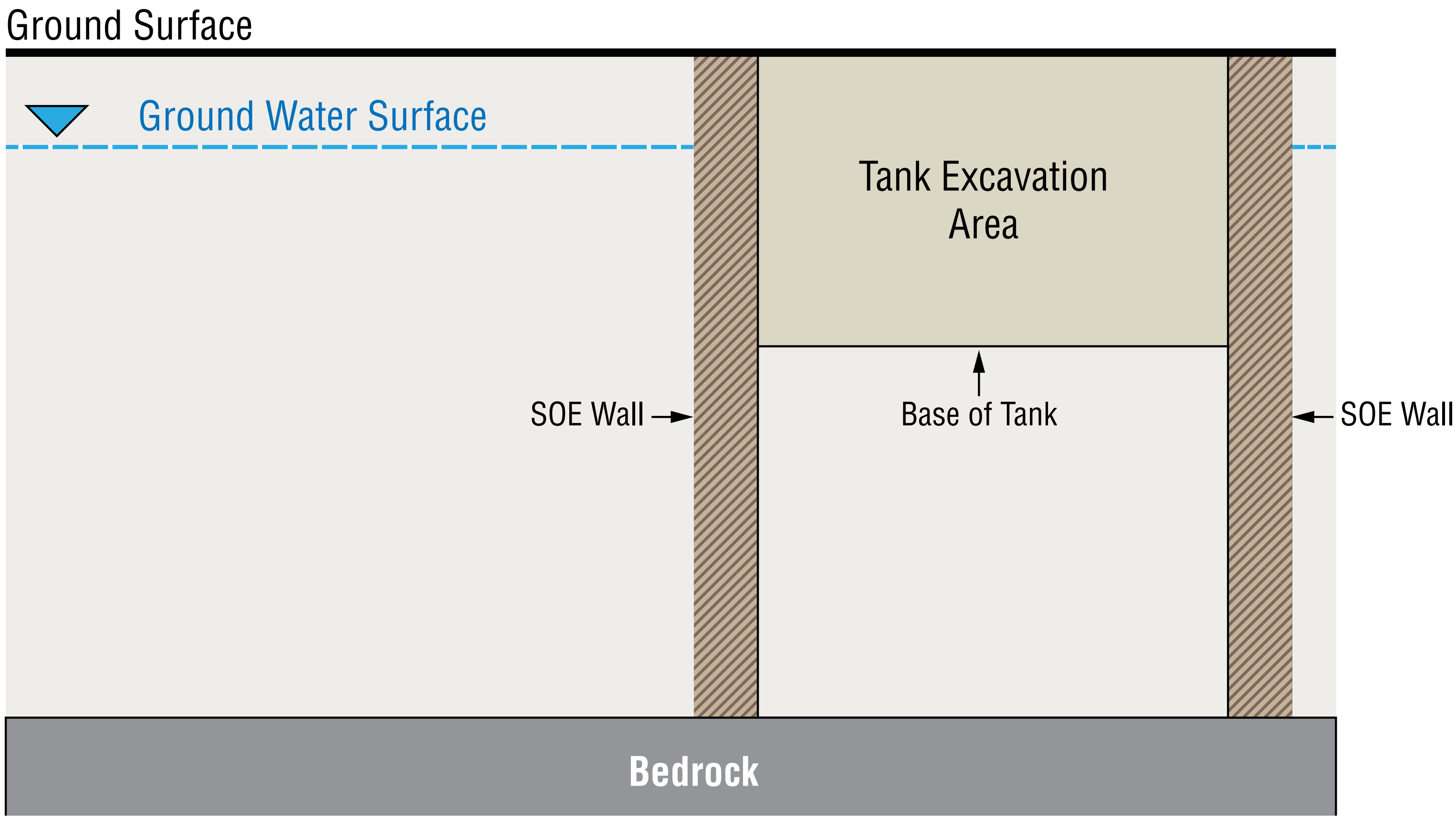
CP-1: SITE PREPARATION, UTILITY RELOCATION, AND DEMOLITION

CP-1 includes site preparation, utility relocation, and demolition activities. The overall duration of CP-1 at each site is expected to take nine months.

Site Preparation

Beginning with site preparation, the work area would be prepared for construction. The construction areas would be fenced off to minimize interference between passersby and the construction work. Additional public safety measures, such as signs, would be installed. Access points to the construction area would also be established and portable toilets and dumpsters for trash would be brought to the site and installed. Construction trailers for on-site workers and DEP staff would also be located at various locations near the project sites. At the Head End Site, construction trailers would either be located on Butler Street between

[1] Independent of the Project, in the time between CP-1 and CP-2, it is expected that National Grid would replace portions of the Canal bulkhead, install the cutoff wall, and excavate and remove MGP related contamination outside the perimeter of the Head End Facility.



Support of Excavation (SOE)

Figure 20-1

Nevins Street and the Canal or on Sackett Street between Nevins Street and the Canal, with locations specified as the design progresses. At the Owls Head Site, construction trailers would be located in various locations on the site. Equipment used for site preparation activities typically includes jack hammers, air compressors, and a variety of small hand-held tools.

Utility Relocation and Abatement

Prior to the start of demolition, existing buildings would have their utilities disconnected and any hazardous materials (e.g., asbestos-containing materials, lead-based paint, or polychlorinated biphenyls) found on-site abated in accordance with applicable regulatory requirements (see Chapter 10, "Hazardous Materials").

Demolition

CP-1 would conclude with the demolition of the existing buildings, beginning with the removal of any economically salvageable materials that could be reused. The interior of the buildings would be deconstructed to the floor plates and structural columns. Netting around the exterior of the buildings would be used to prevent falling materials. Hand tools and excavators with hoe ram attachments would be used for the demolition of the existing structures, and mini excavators and front-end loaders would load the debris into dump trucks for transport. Demolition debris would be sorted prior to being disposed of at landfills to maximize recycling opportunities. The construction staging area for the Head End Site would be cleared with only the concrete foundation slab remaining to support Project construction.

As described in detail in Chapter 7, "Historic and Cultural Resources," the buildings at 242 Nevins Street, 270 Nevins Street and 234 Butler Street, contribute to the significance of the State and National Register (S/NR)~~-~~eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that ~~and~~ their demolition, which is necessary to complete the Project as mandated by USEPA, would constitute a significant adverse impact to ~~architectural resources~~the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. ~~Therefore,~~ DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the buildings to ~~avoid or~~ minimize or mitigate to the extent practicable the adverse impact that would occur through demolition.

Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York City on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with the New York State Historic Preservation Office (SHPO) and USEPA (which~~; this documentation~~ would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential to~~incorporate some salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

At the Head End Site, once CP-1 is complete, it is expected that National Grid would replace portions of the Canal bulkhead, install a cutoff wall, and excavate and remove manufactured gas plant (MGP)-related contamination outside the perimeter of the CSO Facility. This construction activity is independent of the Project and is expected to last one year. Once this work by National Grid is finished, CP-2 construction activities would commence, as discussed below.

CP-2: SOE, SITE EXCAVATION, AND BELOW-GRADE STRUCTURES

CP-2 would include construction of the SOE, site excavation, and construction of the below-grade structures including the tank. The SOE is a deep wall that goes down to bedrock, used to hold back the soil around the excavation area and to cut off the horizontal groundwater seepage into the excavation area (see **Figure 20-1)**. The overall duration of CP-2 construction at each site is expected to take 48 months.

Slabs and Below-Grade Elements Removal

The first stage of CP-2 at the Head End and Owls Head Sites is the removal of the existing buildings' concrete foundation slabs that remained on the sites at the end of CP-1, and any remaining below-grade elements such as buried utilities. Equipment used for this stage of construction is anticipated to include excavators and bulldozers.

SOE

The second stage of CP-2 is construction of the SOE. To construct the SOE, a trench would be dug from the surface, slurry (typically a bentonite clay and water mixture) would be pumped into the trench to form a temporary SOE wall as soil is removed, reinforcement cages would be lowered into the slurry, and concrete would be poured to displace the slurry and form the permanent SOE wall going down to bedrock, cutting off the groundwater. Equipment used for SOE construction is anticipated to include excavators, cranes, and a slurry mixer.

The Head End Site is located within National Grid's Remedial Investigation Parcel Boundaries for the former Fulton MGP Site, which, from approximately 1879 until 1929, produced gas from coal, oil, and other feedstock. These operations led to extensive contamination of soil and groundwater by coal tar and other contaminants, primarily at the Site itself, but also in the vicinity. As discussed in Section 10, "Hazardous Materials," the New York State Department of Environmental Conservation (NYSDEC) issued an administrative consent order and administrative settlement with National Grid's predecessors (Brooklyn Union Gas/Keyspan) to evaluate environmental conditions at a number of sites in New York City and Long Island, New York, that included the Fulton MGP Site (containing the parcels of the Head End Site). Investigation within the Head End Site identified coal tar contamination in the majority of the soil samples (at depths ranging from approximately 6 to 150 feet below grade), ~~and other MGP wastes in the subsurface, including the presence of~~as well as volatile organic compounds (VOCs) (including benzene), semi-volatile organic compounds (SVOCs) (including naphthalene), pesticides, and metals (including lead). Lead was also identified exceeding the USEPA Resource Conservation and Recovery

Act (RCRA) limit for hazardous waste in one soil sample. In the absence of a likely source for this lead, it is most likely to be related to historical fill material or building debris. The groundwater samples identified the presence of VOCs (including benzene), SVOCs (including naphthalene) and metals (including lead) exceeding the NYSDEC Ambient Water Quality Standards (6 NYCRR Parts 700-706). Soil vapor samples were also collected and the results detected VOCs, notably benzene (there are no New York State soil vapor guidance levels).

The Owls Head Site is not located within a former MGP area, but coal tar ~~has been~~was identified in ~~some~~ the majority of Pre-Design Investigation (PDI) ~~the recent deeper~~ borings at depths ranging from approximately 30 to 40 feet and in some borings up to approximately 60 feet. The Site itself has a long history of industrial/commercial uses, similar to most of the properties along the Canal. A 2015 subsurface investigation report confirmed the presence of SVOCs, metals, polychlorinated biphenyls (PCBs), and pesticides in shallow soils.[2] The 2017 Pre-Design Investigation (PDI) (Hazen/Brown and Caldwell 2017, Pre-Design Investigation Report for OH-007) soil samples identified SVOCs (including naphthalene) and metals (including lead) exceeding the NYSDEC Commercial Soil Cleanup Objectives (6 NYCRR Part 375). Lead was also identified exceeding the USEPA RCRA limit for hazardous waste in one soil sample. Although a source of lead was not identified, the most likely source was historical fill material or building debris at the site. Groundwater samples identified the presence of VOCs (including benzene), SVOCs (including naphthalene), and metals (including lead) exceeding the NYSDEC Ambient Water Quality Standards (6 NYCRR Parts 700-706). Soil vapor samples were also collected and the results detected VOCs, notably benzene-).~~Prior to construction, further investigation of the Owls Head Site would be performed by DEP to better determine the nature of the soil that would be excavated.~~

At both Project Sites, as discussed in Chapter 10, "Hazardous Materials," since contamination would be encountered in the groundwater during SOE activities, a groundwater treatment system would be operated to treat water generated from excavation, dewatering, drainage of excavated materials, contact stormwater runoff, decontamination of construction vehicles, equipment and tools, and other sources. Treatment processes would likely include some of the following: equalization, sedimentation, oil-water separation, metals removal, air stripping, and granular activated carbon adsorption. For the purposes of this construction analysis, based on representative groundwater sampling data,[3] an air stripper with granulated carbon adsorption was assumed as necessary treatment to meet groundwater discharge requirements and air quality standards and thresholds, discussed below under "Air Quality."

It is anticipated that effluent from the temporary treatment system would be discharged to the Canal, either directly or via an existing storm sewer connection. Dewatering would be conducted in accordance with applicable permitting requirements. Treatment limits would be established by NYSDEC and/or the U.S. Environmental Protection Agency (USEPA) for discharge to the Canal.

Solids generated from treatment would be disposed off-site (in accordance with applicable regulatory requirements) or regenerated for reuse within the treatment system (e.g., activated carbon).

For the excavated soil, a large area might be needed to stockpile and perhaps dry the material before the soils are removed from the Project Sites. Any contaminated soil would be hauled away to licensed and qualified off-site waste disposal facilities, likely following treatment.

[2] GHD Consulting Services Inc., February 2015, Soil Sampling Analysis Results Summary, BK6 Salt Lot Improvements, Prepared on behalf of New York City Department of Sanitation.

[3] GEI Consultants Inc., July 2012 Final Remedial Investigation Report, Fulton Municipal Works Former Manufactured Gas Plant (MGP), Brooklyn, New York.

To control dust and vapors during CP-2 construction activities, the design may include a fabric structure or a similar enclosure during excavation to cover localized work areas, soil stockpiles in the staging area, or the groundwater treatment system. The analyses for potential impacts from construction activities assume, as a worst-case condition, that the excavation areas and equipment would remain open to the atmosphere and that enclosures would not be used.

Site Excavation

After the SOE is constructed, soil excavation activities would proceed with the use of excavators. When the excavation reaches areas identified for remediation, the soil would be trucked to the staging area and stockpiled for testing. At the staging area, the soil would be processed through a machine that is commonly known as a “pug mill,” where various admixtures such as lime (i.e., calcium oxide, calcium hydroxide, or lime slurry) would be added to chemically neutralize the soil. The processed soil may remain for up to five days in the staging area to cure and would be tested before it is trucked offsite to a licensed and qualified off-site waste disposal facility. A truck washing station would be established to wash down the trucks before they exit the construction area. Implementation of a Stormwater Pollution Prevention Plan (SWPPP) would minimize the potential for impacts from wheel washing activities. Soil management and disposal procedures are discussed in detail in Chapter 10, “Hazardous Materials.”

Multiple levels of bracing for the SOE area would be required to support the SOE wall and prevent it from failing. The bracing would be installed at multiple stages throughout the excavation phase and before excavation is complete. This process would be repeated until the final depth of excavation is reached, where a mud mat (a slab of concrete typically a few inches thick) would be installed as a working surface and a cap to the non-remediated soil. Equipment used for site excavation and SOE bracing activities is anticipated to include excavators, drill rigs, backhoes, loaders, and dozers.

Below-Grade Structures

Once soil excavation is complete, the area previously needed for groundwater treatment and stockpiling within the staging area would be reduced to allow for a laydown area for the below-grade construction materials, such as rebars and concrete forms. Below-grade construction of the tank would then begin with the installation of concrete slabs, exterior walls, and piles as well as the removal of the SOE bracing once the below-grade structure is stabilized. Cranes would be used to lift structural components and other large materials and concrete trucks and pumps would typically be employed for concrete operations. With the exterior walls and slabs stabilized, work on the interior walls would progress. Additional activities associated with tank construction, including below-grade equipment, electrical wiring, and piping installation are included in CP-3, as discussed below. Equipment used during below-grade construction is anticipated to include cranes, rebar benders, and concrete pumps.

CP-3: ABOVE-GRADE STRUCTURES, CONVEYANCES, AND OUTFALLS

CP-3 includes the construction of the above-grade structures at the Project Sites as well as conveyances, outfalls, and landscaping activities. The overall duration of CP-3 construction at each site is expected to take 24 months.

Above-Grade Structures

Once the below-grade activity in CP-2 is complete, construction of the above-grade structures would begin. First, the structures’ framework (beams and columns) and floor decks would be constructed followed by the construction of the interior structures such as vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; stairs; and restroom areas. Cranes would be used to lift structural components and other large materials. Interior fit-out activities including the construction of nonstructural elements such as interior partitions, lighting fixtures, and interior finishes (i.e., flooring, painting, etc.) would then be conducted. Manlifts, forklifts, and a variety of hand tools (i.e., wrench, electric drills, etc.) would typically be used during above-grade construction.

In addition to new structures, below-grade equipment, electrical wiring, and piping installation as well as modifications to existing infrastructure would occur at the Project Sites during CP-3. As discussed in Chapter 1, “Project Description,” the Nevins Street Pumping Station would be rehabilitated or relocated to the Head End Facility, the RH-034 regulator would be modified with new bending weirs, tide gates, and flap valves to maximize diversion of flow and prevent backward flow from the regulator to Nevins Street, and the RH-038 outfall would be rebuilt to accommodate the effluent flow from the Head End Facility. For the Owls Head Facility, the existing 2nd Avenue regulator, located just north of the 2nd Avenue and 5th Street intersection, would be replaced with a new regulator in order to capture the required total design flow rates. Other existing sewer infrastructure, including the existing grit chamber, outfall OH-007, and the 2nd Avenue Pumping Station would be demolished and removed. A new grit chamber, new outfall, and new, similar pumping station with a 1 MGD capacity would be constructed adjacent to or within the Owls Head Facility. In addition, the existing bulkhead at the Owls Head Facility would be replaced. Infrastructure work would typically include excavation, dewatering, installation of the structures, and backfill and restoration.

Conveyance Construction

For construction of conveyance pipelines (force mains and sewers) for both the Head End Facility and the Owls Head Facility, a trench line would first be cut in the existing pavement and then the pavement and soil underneath the pavement would be excavated. Lengths of pipe or conduit would then be laid in the trench, connected, and tested. After the piping is installed, the trench would be backfilled with compacted soil. This stage of the work would involve a pavement cutter, excavators, and backhoes. Flatbed delivery trucks would transport the pipes to the site. Dump trucks would be used to remove soils and deliver bedding material and clean fill, if needed, to the work site. Asphalt trucks and rollers would be used to install any temporary paving cover.

Outfalls Construction

Outfall construction activities would take place at both the Head End and Owls Head Sites. Outfall RH-038 would be rebuilt to accommodate the effluent from the Head End Facility and a new outfall OH-007 would be constructed to accommodate the effluent from the Owls Head Facility. Outfall construction is expected to include: installation of a turbidity curtain with a temporary cofferdam to contain the work zone and allow dewatering pumps to remove water from the outfall work zone site, as needed; all groundwater recovered during dewatering would be treated and discharged to the Canal, as needed for the force main construction, in accordance with applicable regulatory requirements. Installation of the proposed outfall at the Owls Head Site would also require excavation and installation of mini-piles and piping and penetration of the bulkhead for installation. The sheet pile cofferdams and turbidity curtains would be installed prior to the commencement of in-water construction activities associated with demolition and construction of outfall OH-007, and turbidity curtains would be installed prior to installing the bulkhead at the Owls Head Facility, and would be removed when the work is completed (likely after 6 to 9 months). The demolition and reconstruction of outfall OH-007 would be completed within the cofferdam, which would be driven outboard of the toe of the existing shoreline stabilization, minimizing potential increases in suspended sediment and adverse impacts to water quality due to the Project. In addition, following completion of outfall construction at the Owls Head Site, the bulkhead along the northern shoreline of the Owls Head Site would be repaired and replaced.

Landscaping

The remainder of the surface area on the Project Sites is expected to be paved and accessible for maintenance and operations with landscaping, where appropriate. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies, including review by New York City Parks and Recreation (NYC Parks). The Owls Head Site would accommodate the DSNY facility and the remaining portion of the site is expected to be paved and accessible for maintenance and operations with landscaping where appropriate, the site could also be accessible for GCC activities following completion of construction. For paving activities, asphalt would be brought by trucks and placed into a paving machine for spreading and compacting. A roller or compactor would then be used to smooth the surface after the asphalt layer has been placed. For landscaping activities, dump trucks would be used to transport the soil for spreading on site, followed by the installation of grassy areas and plantings.

CONSTRUCTION SCHEDULE

Figure 20-2 illustrates the anticipated construction schedule and durations for the construction of the Head End and Owls Head Facilities. The construction analyses conservatively assume that peak construction activities at both the Head End and Owls Head Sites would occur simultaneously to capture the cumulative nature of construction impacts.[4]

CONSTRUCTION PRACTICES

This section describes the construction practices that would be employed for the Project, including hours of work, construction truck and worker estimates, site access, sidewalk, land, and street closures, parking, erosion and sediment control plans, public safety, and site restoration.

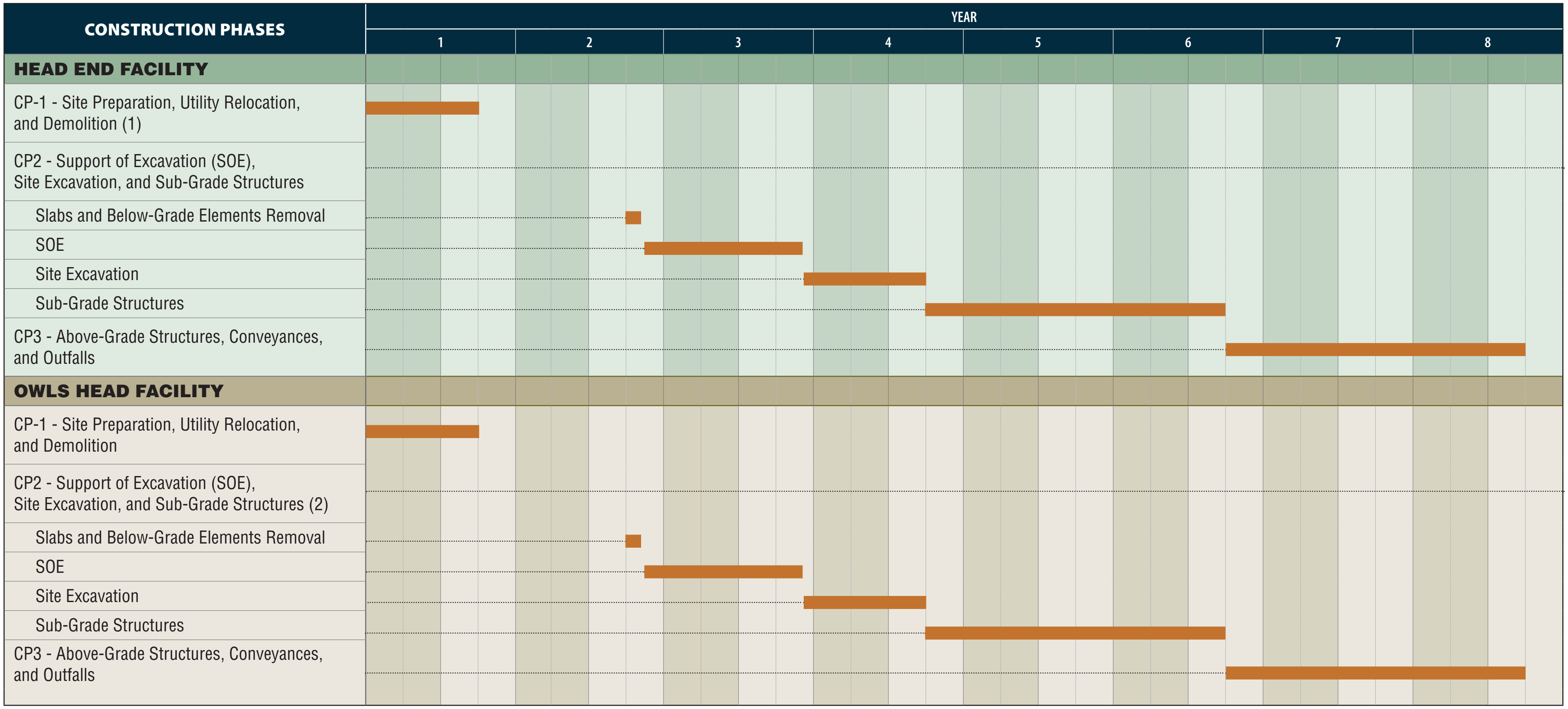
HOURS OF WORK

Permissible construction hours in accordance with New York City laws and regulations are from 7 AM to 6 PM on weekdays. Construction activities typically occur from 7 AM to 3:30 PM, however, the Project construction schedule assumes that construction activities would typically occur in one 10-hour shift from 7 AM to 5 PM, five days a week on weekdays with the potential for some work on weekends to make up for weather delays and/or to accelerate the project construction schedule as determined by the construction contractor. The effects of potential weekend construction work are also assessed in this chapter under Section O, “Alternative Construction Schedule Scenario.” Appropriate work permits from the New York City Department of Buildings (DOB) would be obtained for any necessary work outside of the permissible construction hours (7 AM to 6 PM on weekdays) for weekend or night work.

CONSTRUCTION TRUCK AND WORKER ESTIMATES

Construction truck trip and worker estimates would vary over the construction phases, with the greatest number of truck trips and workers anticipated during CP-2 construction. During this phase, the maximum

[4] The illustrative construction schedule conservatively assumes that the construction activities at the Project Sites would occur simultaneously and therefore, as with the Head End Site, a one year gap between CP-1 and CP-2 was assumed for the Owls Head site even though activities at the Owls Head Site would not be affected by the National Grid work at the Head End Site.



Notes:

(1) Following demolition, there would be work (i.e., bulkhead replacement, cutoff wall installation, MGP related contaminant excavation and removal) conducted by National Grid at the Head End Site. This construction activity, independent of the project, is expected to last up to one year.

(2) Conservatively assumes that CP-2 for the Owls Head Facility would overlap with CP-2 for the Head End Facility.

Anticipated Construction Schedule

Figure 20-2

number of on-site workers would be approximately 36 workers per day at each Project Site throughout the SOE and below-grade structures stages of CP-2 construction. The maximum number of truck roundtrips (i.e., one truck trip entering the site and one truck trip leaving the site) would be approximately 100 per day and 475 per month at each Project Site during the site excavation stage of CP-2 construction.

SITE ACCESS

Based on current design, it is anticipated that during construction, the Head End Site would have a vehicular access/egress location along Nevins Street between Douglass Street and Degraw Street and another potential vehicular egress from the southern portion of the site onto Degraw Street between Nevins Street and the Canal. The Owls Head Site would have one vehicular access/egress location along 2nd Avenue between 5th and 6th Streets.

A portion of the Owls Head Site includes a DSNY storage yard for road salt and snow plows and a community sponsored composting facility, located along the southern side of the Canal as it bends toward the west near the 4th Street turning basin (Block 977, Lot 3). DSNY operations may be relocated within the Owls Head Site but are expected to be maintained throughout the Project's construction period. Access to this facility would be maintained at all times while the CSO facility is being constructed and in operation.

SIDEWALK, LANE, AND STREET CLOSURES

Since the above-grade structure for the Head End Facility would extend to the property line along Butler and Nevins Streets, the curb-lane immediately adjacent to the proposed structure would be closed during CP-1 and CP-3 construction phases during demolition of the existing buildings and construction of the above-grade structure at this location. In addition, temporary sidewalk, lane, and/or street closures are also anticipated to be required during demolition, utility relocation, and conveyance work associated with the Project at both the Head End and Owls Head Facilities.

Maintenance and Protection of Traffic (MPT) plans would be developed for any required temporary sidewalk, lane, and/or street closures to ensure the safety of the construction workers and the public passing through the area. Approval of these plans and implementation of the closures would be coordinated with the New York City Department of Transportation (NYCDOT)'s Office of Construction Mitigation and Coordination (OCMC). Measures specified in the MPT plans that are anticipated to be implemented may include but are not limited to the following: sidewalk closures; curbside moving lane closures; safety signs; safety barriers; and construction fencing. The final MPT plans, together with Traffic Stipulations to be issued by the NYCDOT, would be implemented as part of the Project.

PARKING

Construction workers are generally prohibited from parking their vehicles on-site during the construction period. Parking for construction workers would be available with on-street parking spaces within a ¼-mile radius of the sites.

EROSION AND SEDIMENT CONTROL PLANS

As discussed in detail in Chapter 9, "Natural Resources," upland demolition and construction activities, including force main construction and shoreline stabilization (i.e., bulkhead replacement), would be undertaken in accordance with erosion and sediment control plans and best management practices incorporated into the SWPPP prepared for the Project, as required under the State Pollutant Discharge Elimination System (SPDES) General Permit for Construction Activities.

PUBLIC SAFETY

A variety of measures would be employed to ensure public safety during the construction of the Project. These would include the erection of sidewalk bridges where appropriate during demolition and above-grade construction activities to provide overhead protection for pedestrians passing by the construction area. Construction site perimeter fences would also be erected. Flaggers may be posted as necessary to control trucks entering and exiting the construction sites and/or to provide guidance to pedestrians. Safety netting would be installed in advance of any demolition and above-grade construction where appropriate to prevent debris from falling to the ground. All DOB safety requirements would be followed and construction of the Project would be undertaken so as to ensure the safety of the public.

SITE RESTORATION

The construction staging area at the Head End Site would be leased to DEP and would not contain any permanent facilities as a result of the Project. In the areas not occupied by the Head End Facility or the Owls Head Facility, such as the construction staging areas, these areas would be restored. While the specific details of the restoration plan are still being developed, it is anticipated that the restoration plan could include a combination of paving and planting.

C. CONSTRUCTION TRANSPORTATION

INTRODUCTION

The construction transportation analysis assesses the potential for construction activities to result in significant adverse impacts to traffic, transit (i.e., subway and bus), pedestrian elements (i.e., sidewalks, corners, and crosswalks), and parking conditions. The analysis is based on the peak worker and truck trips during construction of the Project which, as described below, are developed based on several factors including worker modal splits (how the workers access the sites per mode of transportation: automobile, transit, or walking), vehicle occupancy and trip distribution, truck passenger car equivalents (PCEs), and arrival/departure patterns. For the Project, the greatest construction-related traffic, transit, pedestrian, and parking demand would occur during CP-2, where the highest number of construction truck trips would be needed primarily for the removal of excavated materials from the Project Sites. The analysis conservatively assumes that construction activities are simultaneously occurring at both the Head End and Owls Head Sites to capture the cumulative nature of construction impacts.

METHODOLOGY

TRANSPORTATION PLANNING ASSUMPTIONS

Trip generation factors for the Project were developed based on information from U.S. Census data. The trip generation is based on an estimated monthly construction work schedule and average daily construction worker and truck projections.

Construction Worker Modal Splits and Vehicle Occupancy

Based on the latest available U.S. Census data (2000 Census data) for workers in the construction and excavation industry, it is anticipated that 61 percent of construction workers would commute to the Project Sites using private automobiles at an average occupancy of approximately 1.12 persons per vehicle. Similarly, it is expected that approximately 37 percent of construction workers would commute to the Project Sites via transit and the remaining 2 percent would walk to the Project Sites.

TRANSPORTATION SCREENING ASSESSMENT

The *CEQR Technical Manual* identifies procedures for evaluating a Project's potential impacts on traffic, transit, pedestrian, and parking conditions. This methodology begins with the preparation of a trip generation analysis to determine the volume of person and vehicle trips associated with the construction of the Project. The results are then compared with the *CEQR Technical Manual*-specified thresholds (Level 1 screening analysis) to determine whether additional screening and/or quantified analyses are warranted. If the Project would result in 50 or more peak hour vehicle trips or 200 or more peak hour transit or pedestrian trips, a Level 2 screening analysis is performed.

For the Level 2 screening analysis, project-generated trips are assigned to specific intersections, transit routes, and pedestrian elements. If the results of this analysis show that the Project would generate 50 or more peak hour vehicle trips through an intersection, 50 or more peak hour bus riders on a bus route in a single direction, 200 or more peak hour subway passengers at any given station, or 200 or more peak hour pedestrian trips per pedestrian element, further quantified analyses may be warranted to evaluate the potential for significant adverse impacts on traffic, transit, and pedestrian safety. In addition, a detailed parking study, and a vehicular and pedestrian safety analysis may also be conducted when a quantified traffic, transit, and pedestrian analysis is warranted.

Level 1 Screening Analysis

It is anticipated that the peak construction period in terms of transportation at the Head End Site would occur during CP-2, where the highest number of construction truck trips would be needed primarily for the removal of excavated materials from the site. Peak construction activities for CP-2 are anticipated to occur from the third quarter of 2023 to the first quarter of 2024, with approximately 24 on-site workers and 100 truck trips per day throughout the CP-2 construction period.

Similar to the Head End Site, it is anticipated that the peak construction period in terms of transportation at the Owls Head Site would also occur during CP-2. During peak CP-2 construction at the Owls Head Site, there would be approximately 23 on-site workers and 100 truck trips per day. In order to present a conservative analysis, it is assumed that CP-2 construction at both the Head End Site and Owls Head Site would occur simultaneously from the third quarter of 2023 to the first quarter of 2024.

Peak-Hour Construction-Worker and Truck Trips

As discussed above in "Hours of Work," construction activities at the Project Sites are expected to take place from 7:00 AM to 5:00 PM, during one 10 hour shift per day for 5 days per week. While construction truck trips would occur throughout the day, most trucks would remain in the area for short durations, and construction workers would commute during the hours before and after the work shift. For analysis purposes, each truck delivery was assumed to result in two truck trips (one "in" and one "out") and would start arriving to the Project Sites during the hour before each work shift. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips would generally occur during the hour before and after each work shift. Further, in accordance with the *CEQR Technical Manual*, the traffic analysis assumed that each truck has a PCE of 2 while private construction worker automobiles have a PCE of 1.

Head End Site

Tables 20-1 and 20-2 present the hourly vehicle trip projections and the hourly transit and pedestrian trip projections for the Head End Site for the peak construction period (CP-2). As shown, the maximum construction-related traffic increments for the Head End Site would be approximately 43 PCEs between 7:00 AM and 8:00 AM and 40 PCEs between 3:00 PM and 4:00 PM. The maximum construction-related transit and pedestrian increments would be approximately 7 and 19 respectively, between the 6:00 AM and 7:00 AM and 5:00 PM and 6:00 PM peak hours.

Table 20-1
Peak Construction Vehicle Trip Projections: Head End Site

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	10	0	10	10	0	10	20	0	20	30	0	30
7 AM–8 AM	3	0	3	10	10	20	13	10	23	23	20	43
8 AM–9 AM	0	0	0	10	10	20	10	10	20	20	20	40
9 AM–10 AM	0	0	0	10	10	20	10	10	20	20	20	40
10 AM–11 AM	0	0	0	10	10	20	10	10	20	20	20	40
11 AM–12 PM	0	0	0	10	10	20	10	10	20	20	20	40
12 PM–1 PM	0	0	0	10	10	20	10	10	20	20	20	40
1 PM–2 PM	0	0	0	10	10	20	10	10	20	20	20	40
2 PM–3 PM	0	0	0	10	10	20	10	10	20	20	20	40
3 PM–4 PM	0	0	0	10	10	20	10	10	20	20	20	40
4 PM–5 PM	0	3	3	0	10	10	0	13	13	0	23	23
5 PM–6 PM	0	10	10	0	0	0	0	10	10	0	10	10
Daily Total	13	13	26	100	100	200	113	113	226	213	213	426

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Table 20-2
Peak Construction Transit and Pedestrian Trip Projections: Head End Site

	Transit Trips			Pedestrian Trips		
	Regular Shift			Regular Shift		
Hour	In	Out	Total	In	Out	Total
6 AM–7 AM	7	0	7	19	0	19
7 AM–8 AM	2	0	2	5	0	5
8 AM–9 AM	0	0	0	0	0	0
9 AM–10 AM	0	0	0	0	0	0
10 AM–11 AM	0	0	0	0	0	0
11 AM–12 PM	0	0	0	0	0	0
12 PM–1 PM	0	0	0	0	0	0
1 PM–2 PM	0	0	0	0	0	0
2 PM–3 PM	0	0	0	0	0	0
3 PM–4 PM	0	0	0	0	0	0
4 PM–5 PM	0	2	2	0	5	5
5 PM–6 PM	0	7	7	0	19	19

Owls Head Site

Tables 20-3 and 20-4 present the hourly vehicle trip projections and the hourly transit and pedestrian trip projections for the Owls Head Site for the peak construction period (CP-2). As shown, the maximum construction-related traffic increments for the Owls Head Site would be approximately 43 PCEs between 7:00 AM and 8:00 AM and 40 PCEs between 3:00 PM and 4:00 PM and the maximum construction-related transit and pedestrian increments would be approximately 7 and 18 respectively, between the 6:00 AM and 7:00 AM and 5:00 PM and 6:00 PM peak hours.

Table 20-3
Peak Construction Vehicle Trip Projections: Owls Head Site

Hour	Auto Trips Regular Shift			Truck Trips Regular Shift			Total Vehicle Trips			Total PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	10	0	10	10	0	10	20	0	20	30	0	30
7 AM–8 AM	3	0	3	10	10	20	13	10	23	23	20	43
8 AM–9 AM	0	0	0	10	10	20	10	10	20	20	20	40
9 AM–10 AM	0	0	0	10	10	20	10	10	20	20	20	40
10 AM–11 AM	0	0	0	10	10	20	10	10	20	20	20	40
11 AM–12 PM	0	0	0	10	10	20	10	10	20	20	20	40
12 PM–1 PM	0	0	0	10	10	20	10	10	20	20	20	40
1 PM–2 PM	0	0	0	10	10	20	10	10	20	20	20	40
2 PM–3 PM	0	0	0	10	10	20	10	10	20	20	20	40
3 PM–4 PM	0	0	0	10	10	20	10	10	20	20	20	40
4 PM–5 PM	0	3	3	0	10	10	0	13	13	0	23	23
5 PM–6 PM	0	10	10	0	0	0	0	10	10	0	10	10
Daily Total	13	13	26	100	100	200	113	113	226	213	213	426

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Table 20-4
Peak Construction Transit and Pedestrian Trip Projections: Owls Head Site

Hour	Transit Trips Regular Shift			Pedestrian Trips Regular Shift		
	In	Out	Total	In	Out	Total
6 AM–7 AM	7	0	7	18	0	18
7 AM–8 AM	2	0	2	5	0	5
8 AM–9 AM	0	0	0	0	0	0
9 AM–10 AM	0	0	0	0	0	0
10 AM–11 AM	0	0	0	0	0	0
11 AM–12 PM	0	0	0	0	0	0
12 AM–1 PM	0	0	0	0	0	0
1 AM–2 PM	0	0	0	0	0	0
2 AM–3 PM	0	0	0	0	0	0
3 AM–4 PM	0	0	0	0	0	0
4 AM–5 PM	0	2	2	0	5	5
5 AM–6 PM	0	7	7	0	18	18
Daily Total	9	9	18	23	23	46

Cumulative Effects (Head End Site and Owls Head Site)

The cumulative construction trips in PCEs for the Head End and Owls Head Sites are presented in **Table 20-5** and the cumulative transit and pedestrian trips for both facilities are presented in **Table 20-6**. The cumulative peak quarter construction-related traffic increments would be approximately 86 PCEs between 7:00 AM and 8:00 AM and 80 PCEs between 3:00 PM and 4:00 PM. The peak quarter construction-related transit and pedestrian increments would be approximately 14 and 37, respectively between the 6:00 AM and 7:00 AM and 5:00 PM and 6:00 PM peak hours.

Table 20-5
Cumulative Peak Construction Vehicle Trip Projections

Hour	Auto Trips Regular Shift			Truck Trips Regular Shift			Total Vehicle Trips			Total PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	20	0	20	20	0	20	40	0	40	60	0	60
7 AM–8 AM	6	0	6	20	20	40	26	20	46	46	40	86
8 AM–9 AM	0	0	0	20	20	40	20	20	40	40	40	80
9 AM–10 AM	0	0	0	20	20	40	20	20	40	40	40	80
10 AM–11 AM	0	0	0	20	20	40	20	20	40	40	40	80
11 AM–12 PM	0	0	0	20	20	40	20	20	40	40	40	80
12 AM–1 PM	0	0	0	20	20	40	20	20	40	40	40	80
1 AM–2 PM	0	0	0	20	20	40	20	20	40	40	40	80
2 AM–3 PM	0	0	0	20	20	40	20	20	40	40	40	80
3 AM–4 PM	0	0	0	20	20	40	20	20	40	40	40	80
4 AM–5 PM	0	6	6	0	20	20	0	26	26	0	46	46
5 AM–6 PM	0	20	20	0	0	0	0	20	20	0	20	20
Daily Total	26	26	52	200	200	400	226	226	452	426	426	852

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Table 20-6
Cumulative Peak Construction Transit and Pedestrian Trip Projections

Hour	Transit Trips Regular Shift			Pedestrian Trips Regular Shift		
	In	Out	Total	In	Out	Total
6 AM–7 AM	14	0	14	37	0	37
7 AM–8 AM	4	0	4	10	0	10
8 AM–9 AM	0	0	0	0	0	0
9 AM–10 AM	0	0	0	0	0	0
10 AM–11 AM	0	0	0	0	0	0
11 AM–12 PM	0	0	0	0	0	0
12 AM–1 PM	0	0	0	0	0	0
1 AM–2 PM	0	0	0	0	0	0
2 AM–3 PM	0	0	0	0	0	0
3 AM–4 PM	0	0	0	0	0	0
4 AM–5 PM	0	4	4	0	10	10
5 AM–6 PM	0	14	14	0	37	37
Daily Total	18	18	36	47	47	94

Traffic

As shown in **Table 20-5**, the cumulative construction trips would be 86 PCEs during the 7:00 AM and 8:00 AM peak hour and 80 PCEs during the 3:00 PM and 4:00 PM peak hour. Since the incremental vehicle trips in PCEs would be greater than the *CEQR Technical Manual* analysis threshold of 50 vehicle trips during the peak hour, a Level 2 screening assessment is required.

Transit

As discussed above, it is expected that approximately 37 percent of construction workers would commute to the Project Sites via transit. As shown in **Table 20-6**, the cumulative transit trips would be only 14 during the AM and PM peak hours. Since these trips are well below the 200-transit-trip *CEQR Technical Manual* analysis threshold, detailed transit analysis is not warranted and the Project is not expected to result in any significant adverse transit impacts during construction.

Pedestrians

As shown in **Table 20-6**, the cumulative pedestrian trips would be only 37 during the AM and PM peak hours. Since these trips are well below the 200-pedestrian trip *CEQR Technical Manual* analysis threshold, a detailed pedestrian analysis is not warranted and the Project is not expected to result in any significant adverse pedestrian impacts during construction.

Parking

An inventory of on-street parking was conducted within a ¼-mile radius of the Head End and Owls Head Facilities in accordance with the *CEQR Technical Manual*. The on-street survey was conducted in October, 2016 and involved observations of the weekday AM utilization from 6:00 AM to 8:00 AM and showed that there are approximately 2,680 on-street parking spaces within a ¼-mile radius of the Project Sites. Out of these on-street spaces, approximately 98 spaces were available during the morning peak period resulting in an overall utilization rate of approximately 96 percent. As shown in **Table 20-5**, there would be a demand of 26 parking spaces for construction workers arriving to the Project Sites during peak construction of the Project. This future parking demand during construction could be accommodated within the available on-street parking spaces and therefore, the Project is not expected to result in the potential for a parking shortfall or a significant adverse parking impact during construction.

Level 2 Screening Analysis

As discussed above, since the cumulative incremental vehicle trips in PCEs would exceed the 50 vehicle trip *CEQR Technical Manual* analysis threshold during the 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours, a Level 2 screening analysis for traffic was prepared and is presented below.

Site Access and Egress

Based on current design, it is assumed that during construction, the Head End Site would have a vehicular access/egress location along Nevins Street between Douglass and Degraw Streets and another potential vehicular egress from the southern portion of the site onto Degraw Street between Nevins Street and the Canal**.** The Owls Head Site would have one vehicular access/egress location along 2nd Avenue between 5th and 6th Streets. Construction workers are generally prohibited from parking their vehicles on-site during the construction period and would be accommodated by available on-street parking spaces within a ¼-mile radius of the Project Sites.

Traffic Assignment Assumptions

The construction vehicle trips were assigned to area intersections based on the most likely travel routes to and from the Project Sites, prevailing travel patterns, commuter origin-destination (O-D) summaries from the census data, the configuration of the roadway network, and the expected locations of site access and egress. All truck delivery trips (trucks arriving to and leaving from the Project Sites) were assigned to the Project Sites via NYCDOT-designated truck routes. Traffic assignments for automobiles and truck deliveries are discussed below.

Construction Worker Autos

The assignments for construction workers were based on the 2006–2010 U.S. Census Bureau American Community Survey (ACS) reverse journey-to-work origin-destination estimates[5]. The majority of the

[5] The modal split and vehicle occupancy estimates were based on the latest available data (2000 Census data) for workers in the construction and excavation industry for these fields and the construction worker assignment estimates were based on the latest available data (2006–2010 U.S. Census ACS) for this field.

trips would originate from within the local region of Brooklyn (60 percent: 24 percent from the north and 36 percent from the south), with the remaining trips originating from Queens (15 percent), Staten Island (11 percent), Long Island (7 percent), the Bronx (3 percent), New Jersey (3 percent), and Manhattan (1 percent). All of the auto trips were assigned to the nearby available on-street parking spaces near the Project Sites. Trips from Manhattan and the Bronx are expected to use the Harlem River or East River crossings and the Brooklyn-Queens Expressway (BQE) to access the area via the most direct local routes available. Most trips from Queens and Long Island would follow similar routes on the east side of the East River along the BQE. Trips from Brooklyn would use local streets, the Gowanus Expressway, the BQE, and the Prospect Expressway, while those from Staten Island and New Jersey are expected to cross over the Verrazano-Narrows Bridge and follow similar routes in Brooklyn to access the area.

Deliveries

Truck delivery trips were assigned to NYCDOT-designated truck routes. Trucks were assigned to and from the vehicular access/egress locations at Nevins Street and at 2nd Avenue via the Manhattan Bridge, Hugh L. Carey Tunnel, the Prospect Expressway, the Gowanus Expressway, the BQE, the Verrazano-Narrows Bridge, 3rd Avenue, 4th Avenue, 9th Street, and Nevins Street. They would remain on the designated truck routes as long as possible, until reaching the Project Sites.

Summary

The 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM incremental construction trips in PCEs at intersections near the Head End Site are shown in **Figures 20-3 and 20-4**. The 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM incremental construction trips in PCEs at intersections near the Owls Head Site are shown in **Figures 20-5 and 20-6**. The 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM cumulative incremental construction trips in PCEs for both Sites are shown in **Figures 20-7 and 20-8**. The maximum number of incremental vehicle trips in PCEs for any particular intersection during a peak hour was estimated as 41 PCEs at the intersection of 2nd Avenue and West 9th Street during the 7:00 AM to 8:00 AM peak hour, less than the *CEQR Technical Manual* analysis threshold of 50 peak hour vehicle trips requiring a quantified analysis. However, in consultation with DEP and NYCDOT, a quantified construction traffic analysis was prepared to assess the effects of the projected construction activities on selective intersections near the Project Sites. As presented in **Table 20-7 and Figure 20-9**, based on an assessment of the traffic network and the projected construction increments anticipated to occur at these locations, seven intersections (four signalized and three unsignalized) were selected for analysis for the 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours.

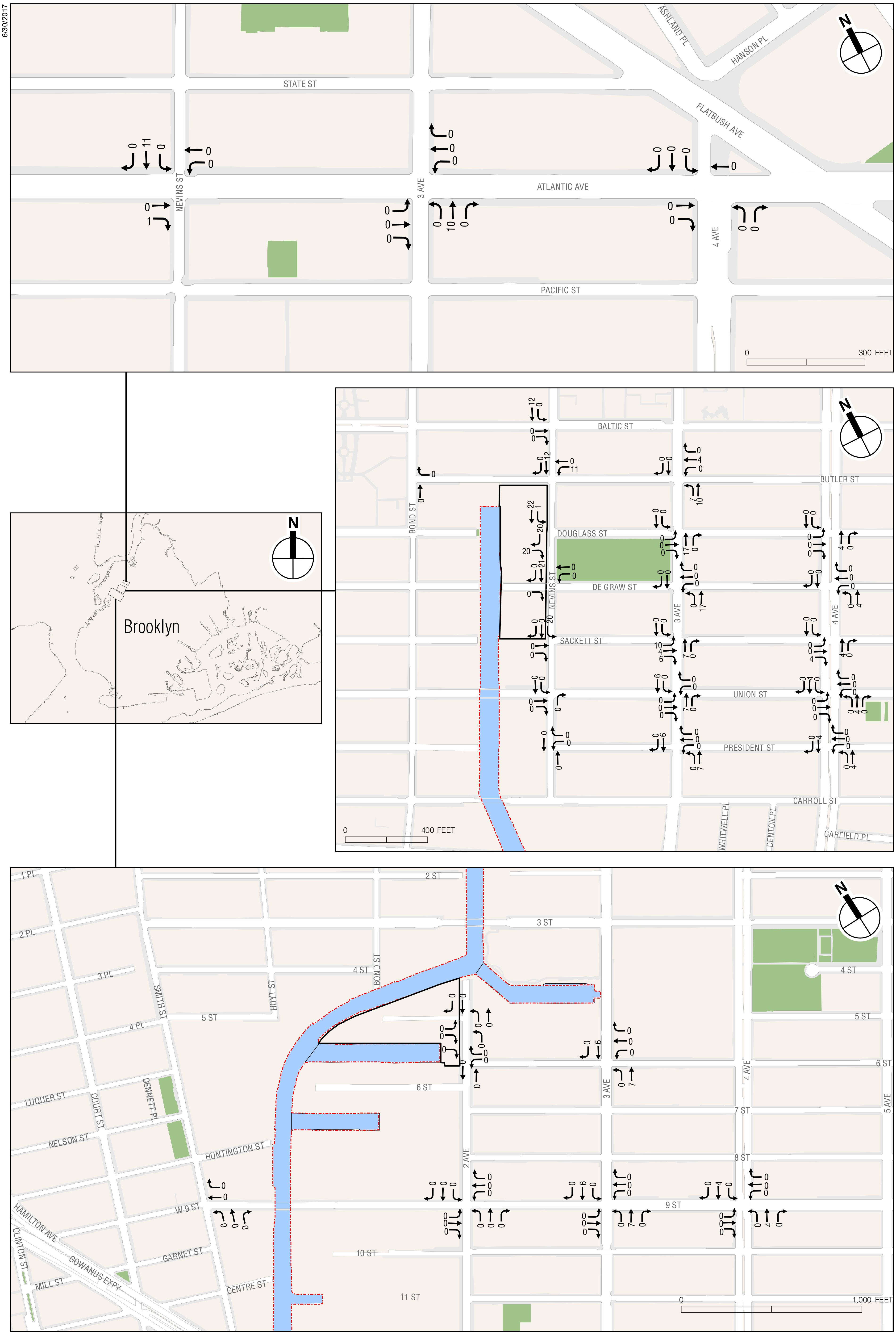
DETAILED TRANSPORTATION ANALYSIS

As described above and shown in **Table 20-7**, seven intersections have been selected for analysis in the 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours. All analysis intersections are signalized except for the Butler Street and Nevins Street, Degraw Street and Nevins Street, and 6th Street and 2nd Avenue intersections.

Traffic Operations

The operations of all of the signalized and unsignalized intersections presented above and defined in **Table 20-7** were assessed using methodologies presented in the *2000 Highway Capacity Manual (HCM)* using the *Highway Capacity Software (HCS+ 5.5)* as adopted by NYCDOT. The *HCM* procedure evaluates the levels of service (LOS) for signalized and unsignalized intersections using average stop control delay, in seconds per vehicle, as described below.

6/30/2017



Project Sites

Gowanus Canal

Total Construction PCE Trips: Head End Site
7-8 AM Peak Hour

Project Sites

Gowanus Canal

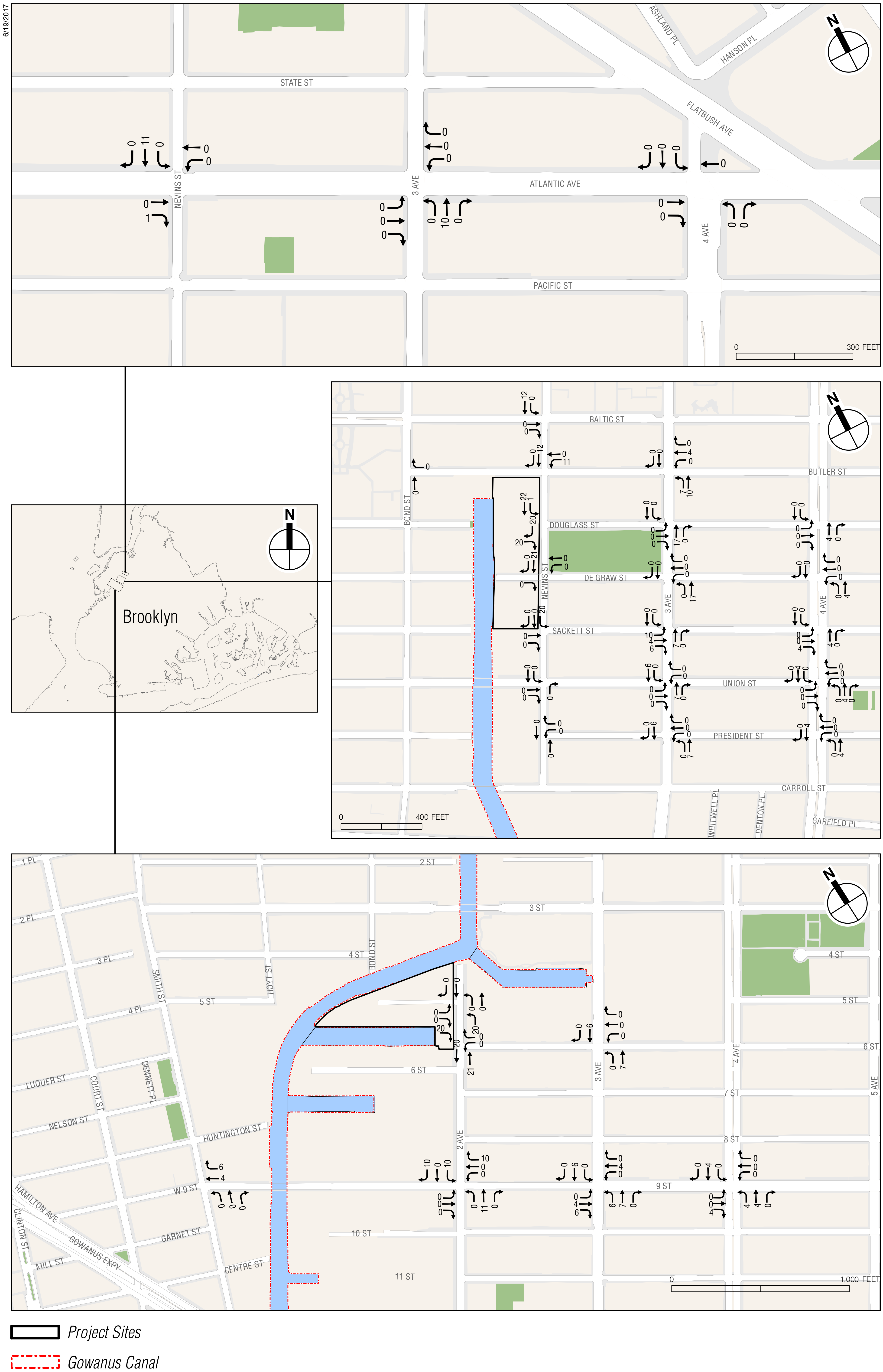
Total Construction PCE Trips: Head End Site
3-4 PM Peak Hour
Figure 20-4

Total Construction PCE Trips: Owls Head Site
7-8 AM Peak Hour
Figure 20-5

Project Sites

Gowanus Canal

Total Construction PCE Trips: Owls Head Site
3-4 PM Peak Hour



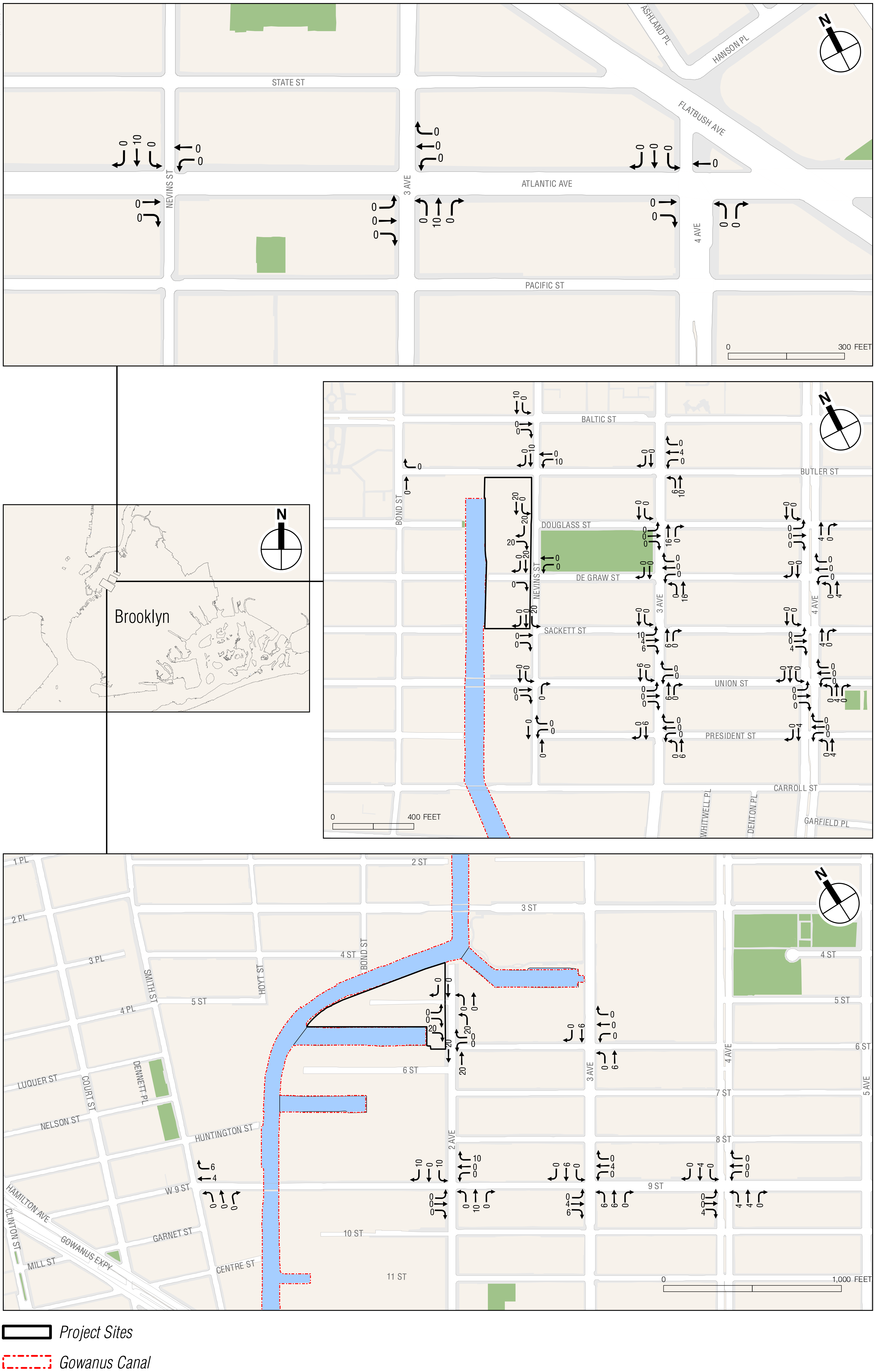
Cumulative Construction PCE Trips: Both Sites

7-8 AM Peak Hour

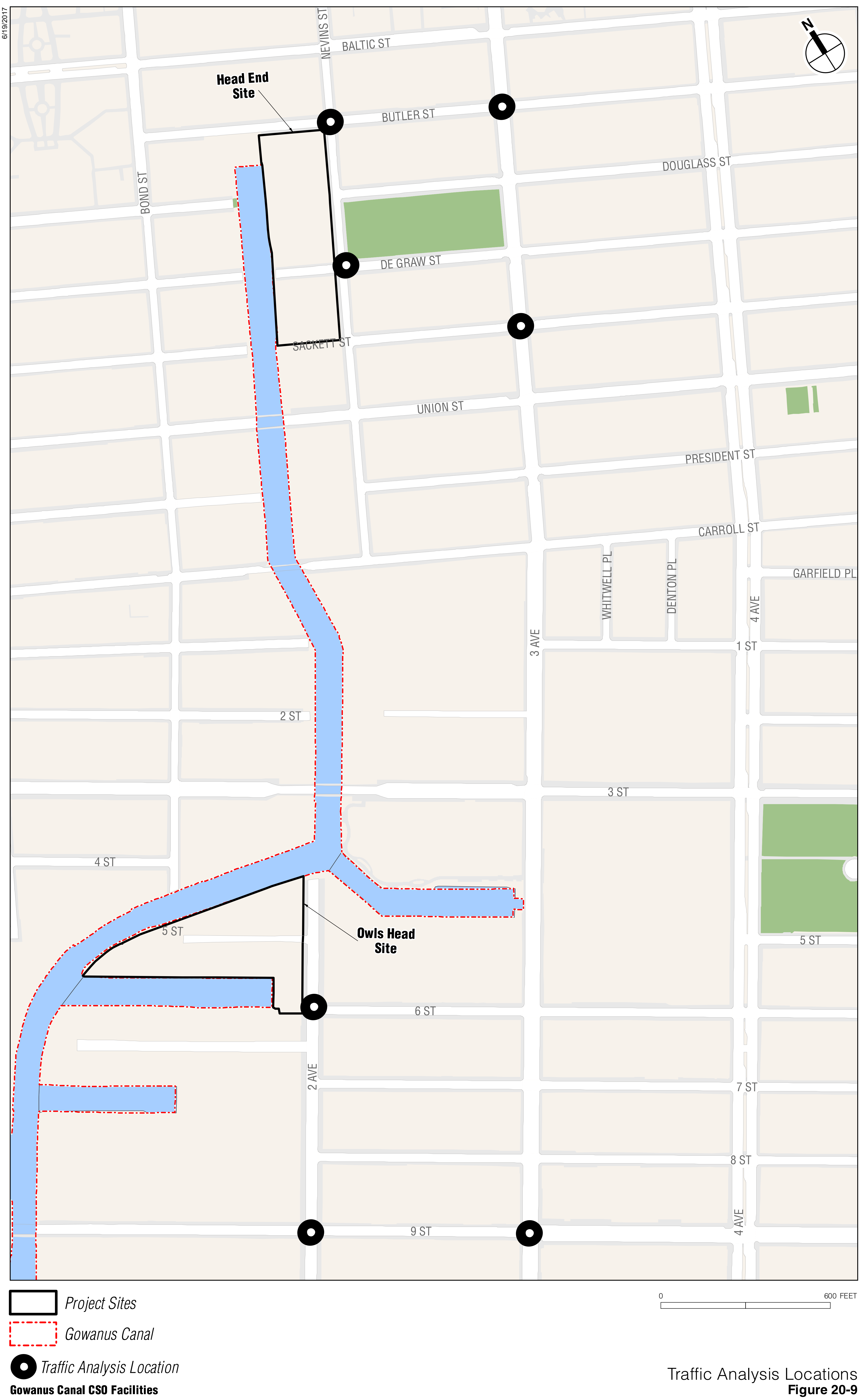
Gowanus Canal CSO Facilities

Figure 20-7

6/19/2017



Cumulative Construction PCE Trips: Both Sites
3-4 PM Peak Hour



Gowanus Canal CSO Facilities

Traffic Analysis Locations
Figure 20-9

Signalized Intersections

The average control delay per vehicle is the basis for LOS determination for individual lane groups (grouping of movements in one or more travel lanes), the approaches, and the overall intersection. The levels of service are defined in **Table 20-8**.

Table 20-7
Traffic Level 2 Screening Analysis Results in PCEs—
Selected Analysis Locations

Intersection	Intersection Type	Weekday		Selected Analysis Locations
		7:00–8:00 AM	3:00–4:00 PM	
Atlantic Avenue and Nevins Street	Signalized	12	10	
Atlantic Avenue and 3rd Avenue	Signalized	10	10	
Atlantic Avenue and 4th Avenue	Signalized	0	0	
Baltic Street and Nevins Street	Unsignalized	12	10	
Butler Street and Bond Street	Unsignalized	0	0	
Butler Street and Nevins Street	**Unsignalized**	**23**	**20**	✓
Butler Street and 3rd Avenue	**Signalized**	**21**	**20**	✓
Douglass Street and Nevins Street[1]	Uncontrolled	*23*	*20*	
Douglass Street and 3rd Avenue	Signalized	17	16	
Douglass Street and 4th Avenue	Unsignalized	4	4	
Degraw Street and Nevins Street	**Unsignalized**	**21**	**20**	✓
Degraw Street and 3rd Avenue	Signalized	17	16	
Degraw Street and 4th Avenue	Signalized	4	4	
Sackett Street and Nevins Street[1]	Uncontrolled	*20*	*20*	
Sackett Street and 3rd Avenue	**Signalized**	**27**	**26**	✓
Sackett Street and 4th Avenue	Signalized	8	8	
Union Street and Nevins Street	Signalized	0	0	
Union Street and 3rd Avenue	Signalized	13	12	
Union Street and 4th Avenue	Signalized	8	8	
President Street and Nevins Street	Unsignalized	0	0	
President Street and 3rd Avenue	Signalized	13	12	
President Street and 4th Avenue	Signalized	8	8	
5th Street and 2nd Avenue	Unsignalized	0	0	
6th Street and 2nd Avenue	**Unsignalized**	**41**	**40**	✓
6th Street and 3rd Avenue	Signalized	13	12	
9th Street and Smith Street	Signalized	10	10	
9th Street and 2nd Avenue	**Signalized**	**41**	**40**	✓
9th Street and 3rd Avenue	**Signalized**	**33**	**32**	✓
9th Street and 4th Avenue	Signalized	16	16	

Notes: ✓ denotes intersections selected for the detailed traffic analysis.
1. Intersection not analyzed due to the absence of traffic control devices (i.e., traffic signal or stop sign) and lack of minor street approach traffic. Note that intersections with no traffic control devices do not have a stop sign or a traffic signal and are considered uncontrolled. These locations cannot be analyzed in the Highway Capacity Software (HCS) since the vehicles passing through these intersections would be classified as “free flow” vehicles that do not need to stop. Unsignalized intersections do not have a traffic signal but have stop signs to control traffic.

Table 20-8
Level of Service Criteria for Signalized Intersections

LOS	Average Control Delay
A	≤ 10.0 seconds
B	>10.0 and ≤ 20.0 seconds
C	>20.0 and ≤ 35.0 seconds
D	>35.0 and ≤ 55.0 seconds
E	>55.0 and ≤ 80.0 seconds
F	>80.0 seconds
Source:	Transportation Research Board. *Highway Capacity Manual*, 2000.

Although the *HCM* methodology calculates a volume-to-capacity (v/c) ratio, there is no strict relationship between v/c ratios and LOS as defined in the *HCM*. A high v/c ratio indicates substantial traffic passing through an intersection, but a high v/c ratio combined with low average delay actually represents the most efficient condition in terms of traffic engineering standards, where an approach or the whole intersection processes traffic close to its theoretical maximum capacity with minimal delay. However, very high v/c ratios—especially those approaching or greater than 1.0—are often correlated with a deteriorated LOS. Other important variables affecting delay include cycle length, progression, and green time. LOS A and B indicate good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition where congestion levels are more noticeable and individual cycle failures (a condition where motorists may have to wait for more than one green phase to clear the intersection) can occur. Conditions at LOS E and F reflect poor service levels, and cycle breakdowns are frequent. The *HCM* methodology also provides for a summary of the total intersection operating conditions. The analysis chooses the two critical movements (the worst case from each roadway) and calculates a summary critical v/c ratio. The overall intersection delay, which determines the intersection's LOS, is based on a weighted average of control delays of the individual lane groups. Within New York City, the midpoint of LOS D (45 seconds of delay) is generally considered as the threshold between acceptable and unacceptable operations.

Significant Impact Criteria

According to the criteria presented in the *CEQR Technical Manual*, impacts are considered significant and require examination of mitigation if they result in an increase of 5 or more seconds of delay in a lane group beyond mid-LOS D levels in the Future With the Project (With Project) condition over the Future Without the Project (Without Project) condition. For LOS E, a 4-second increase in delay is considered significant and for LOS F, a 3-second increase in delay is considered significant. In addition, impacts are considered significant if levels of service deteriorate from acceptable A, B, or C in the Future Without the Project condition to marginally unacceptable LOS D (a delay in excess of 45 seconds, the midpoint of LOS D), or unacceptable LOS E or F in the Future With the Project condition.

Unsignalized Intersections

For unsignalized intersections, the average control delay is defined as the total elapsed time from which a vehicle stops at the end of the queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue to the first-in-queue position. The average control delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. The LOS criteria for unsignalized intersections are summarized in **Table 20-9**.

Table 20-9
Level of Service Criteria for Unsignalized Intersections

LOS	Average Control Delay
A	≤ 10.0 seconds
B	> 10.0 and ≤ 15.0 seconds
C	> 15.0 and ≤ 25.0 seconds
D	> 25.0 and ≤ 35.0 seconds
E	> 35.0 and ≤ 50.0 seconds
F	> 50.0 seconds
Source: Transportation Research Board. *Highway Capacity Manual*, 2000.	

The LOS thresholds for unsignalized intersections are different from those for signalized intersections. The primary reason is that drivers expect different levels of performance from different types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection; hence, the corresponding control delays are higher at a signalized intersection than at an unsignalized intersection for the same LOS. In addition, certain driver behavioral considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, whereas drivers on minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections. For these reasons, the corresponding delay thresholds for unsignalized intersections are lower than those of signalized intersections. As with signalized intersections, within New York City, the midpoint of LOS D (30 seconds of delay) is generally perceived as the threshold between acceptable and unacceptable operations.

Significant Impact Criteria

The same sliding scale of significant delays described for signalized intersections applies for unsignalized intersections. For the minor street to trigger significant impacts, at least 90 passenger car equivalents (PCE) must be identified in the Future with the Project condition in any peak hour.

Vehicular and Pedestrian Safety Evaluation

An evaluation of vehicular and pedestrian safety is necessary for locations within the traffic and pedestrian study areas that have been identified as high accident locations, where 48 or more total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes occurred in any consecutive 12 months of the most recent 3-year period for which data are available. For these locations, accident trends are identified to determine whether projected vehicular and pedestrian traffic would further impact safety at these locations. The determination of potential significant safety impacts depends on the type of area where the Project Site is located, traffic volumes, accident types and severity, and other contributing factors. Where appropriate, measures to improve traffic and pedestrian safety are identified and coordinated with NYCDOT for their approval.

EXISTING CONDITIONS

Traffic data were collected in October 2016 for the weekday AM, midday, and PM peak periods via a combination of vehicle counts using video data collection technology and 24-hour Automatic Traffic Recorder (ATR) counts. The 2016 existing peak period traffic volumes were developed based on these counts.

ROADWAY NETWORK AND TRAFFIC STUDY AREA

The roadways in the study area encompassing the two CSO facilities include 2nd Avenue, 3rd Avenue, Nevins Street, 9th Street, 6th Street, Butler Street, Degraw Street, and Sackett Street. The physical and operational characteristics of the study area roadways are as follows:

- 2nd Avenue is a local two-way northbound-southbound roadway that operates between the Gowanus Expressway and 5th Street with a curb-to-curb width of approximately 45 feet. Curbside parking is provided along both sides of the street.
- 3rd Avenue is a major two-way northbound-southbound roadway that has one to two lanes in the northbound direction and one lane in the southbound direction with a curb-to-curb width of approximately 50 to 60 feet. The B37 bus route operates along 3rd Avenue in both directions and the B103 bus route operates along 3rd Avenue in the northbound direction. Curbside parking is provided along both sides of the street.
- Nevins Street is a local one-way southbound roadway that operates between Fulton Street and Carroll Street with a curb-to-curb width of approximately 25 feet. Curbside parking is provided along both sides of the street.
- 9th Street is a local two-way eastbound-westbound roadway that has one lane in each direction with a curb-to-curb width of approximately 35 to 55 feet. The B61 bus route operates along 9th Street in both directions and limited curbside parking is provided along both sides of the street.
- 6th Street is a local one-way westbound roadway that operates east of 2nd Avenue with a curb-to-curb width of approximately 30 feet. Curbside parking is provided along both sides of the street.
- Butler Street is a local one-way westbound roadway that operates from Court Street to Fifth Avenue with a curb-to-curb width of approximately 30 feet. Curbside parking is provided along both sides of the street.
- Degraw Street is a local roadway that operates one-way eastbound to the west of the Gowanus Canal and one-way westbound to the east of Nevins Street with a curb-to-curb width of approximately 30 feet. Curbside parking is provided along both sides of the street.
- Sackett Street is a local roadway that operates one-way westbound to the west of the Gowanus Canal and one-way eastbound to the east of Nevins Street with a curb-to-curb width of approximately 30 feet. Curbside parking is provided along both sides of the street. Between Nevins Street and the Gowanus Canal, Sackett Street is gated off and functions as a private two-way drive serving the adjacent properties. Minimal volumes of traffic were observed traversing this segment of Sackett Street throughout the day.

TRAFFIC CONDITIONS

Inventories of roadway geometry, traffic controls, bus stops, and parking regulations/activities were recorded to provide appropriate inputs for the construction traffic analyses. Official signal timings were also obtained from NYCDOT for use in the analysis of the study area signalized intersections. **Figures 20-10 and 20-11** show the 2016 existing traffic volumes for the weekday 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours, respectively.

LEVELS OF SERVICE

A summary of the 2016 existing conditions traffic analysis results are presented in **Table 20-10**. Details on level-of-service, v/c ratios, and average delays are presented in **Tables 20-11 and 20-12**.

Project Sites

Gowanus Canal

2016 Existing Traffic Volumes
7-8 AM Peak Hour
Figure 20-10

2016 Existing Traffic Volumes
3-4 PM Peak Hour
Figure 20-11

Table 20-10
Summary of 2016 Existing Traffic Analysis Results

Level of Service	Analysis Peak Hours: Weekday AM (7:00 AM to 8:00 AM)	Weekday PM (3:00 PM to 4:00 PM)
Lane Groups at LOS A/B/C	21	19
Lane Groups at LOS D	2	4
Lane Groups at LOS E	1	2
Lane Groups at LOS F	1	0
Total	25	25
Lane Groups with v/c ≥ 0.90	1	1
Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio.		

Table 20-11
2016 Existing Conditions Level of Service Analysis
Signalized Intersections

Intersection	Weekday AM				Weekday PM			
	Lane Group	v/c Ratio	Delay (Sec)	v/c Ratio	Lane Group	v/c Ratio	Delay (Sec)	v/c Ratio
Butler Street and 3rd Avenue								
WB	LTR	0.27	23.9	C	LTR	0.45	41.8	D
NB	LT	0.37	19.3	B	LT	0.50	12.1	B
SB	TR	0.31	18.9	B	TR	0.38	10.0	B
	Intersection		20.1	C	Intersection		16.6	B
Sackett Street and 3rd Avenue								
EB	LTR	0.16	25.6	C	LTR	0.43	40.6	D
NB	TR	0.35	16.2	B	TR	0.56	13.5	B
SB	LT	0.28	15.7	B	LT	0.46	11.8	B
	Intersection		16.9	B	Intersection		17.0	B
9th Street and 2nd Avenue								
EB	L	0.14	12.5	B	L	0.14	12.2	B
	TR	0.31	13.1	B	TR	0.39	14.0	B
WB	L	0.06	10.8	B	L	0.09	11.1	B
	TR	0.70	20.3	C	TR	0.68	19.5	B
NB	LTR	0.21	12.1	B	LTR	0.22	12.1	B
SB	LTR	0.17	11.7	B	LTR	0.30	12.9	B
	Intersection		16.5	B	Intersection		15.8	B
9th Street and 3rd Avenue								
EB	L	0.47	69.4	E	L	0.60	72.0	E
	TR	0.41	44.7	D	TR	0.54	47.8	D
WB	L	0.23	42.0	D	L	0.31	45.0	D
	TR	1.05	108.0	F	TR	0.92	77.9	E
NB	L	0.20	12.4	B	L	0.14	11.8	B
	TR	0.47	14.9	B	TR	0.38	13.6	B
SB	L	0.10	11.4	B	L	0.21	12.9	B
	TR	0.42	14.8	B	TR	0.61	18.7	B
	Intersection		37.1	D	Intersection		32.0	C
Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.								

Table 20-12
2016 Existing Conditions Level of Service Analysis
Unsignalized Intersections

Intersection	Weekday AM				Weekday PM			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Butler Street and Nevins Street								
WB	LT	0.44	8.9	A	LT	0.42	9.3	A
SB	TR	0.36	8.3	A	TR	0.52	9.9	A
Degraw Street and Nevins Street								
WB	LT	0.06	9.7	A	LT	0.09	10.9	B
EB	R	0.01	9.7	A	R	0.02	9.7	A
6th Street and 2nd Avenue								
WB	LR	0.09	9.3	A	LR	0.15	9.6	A

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.

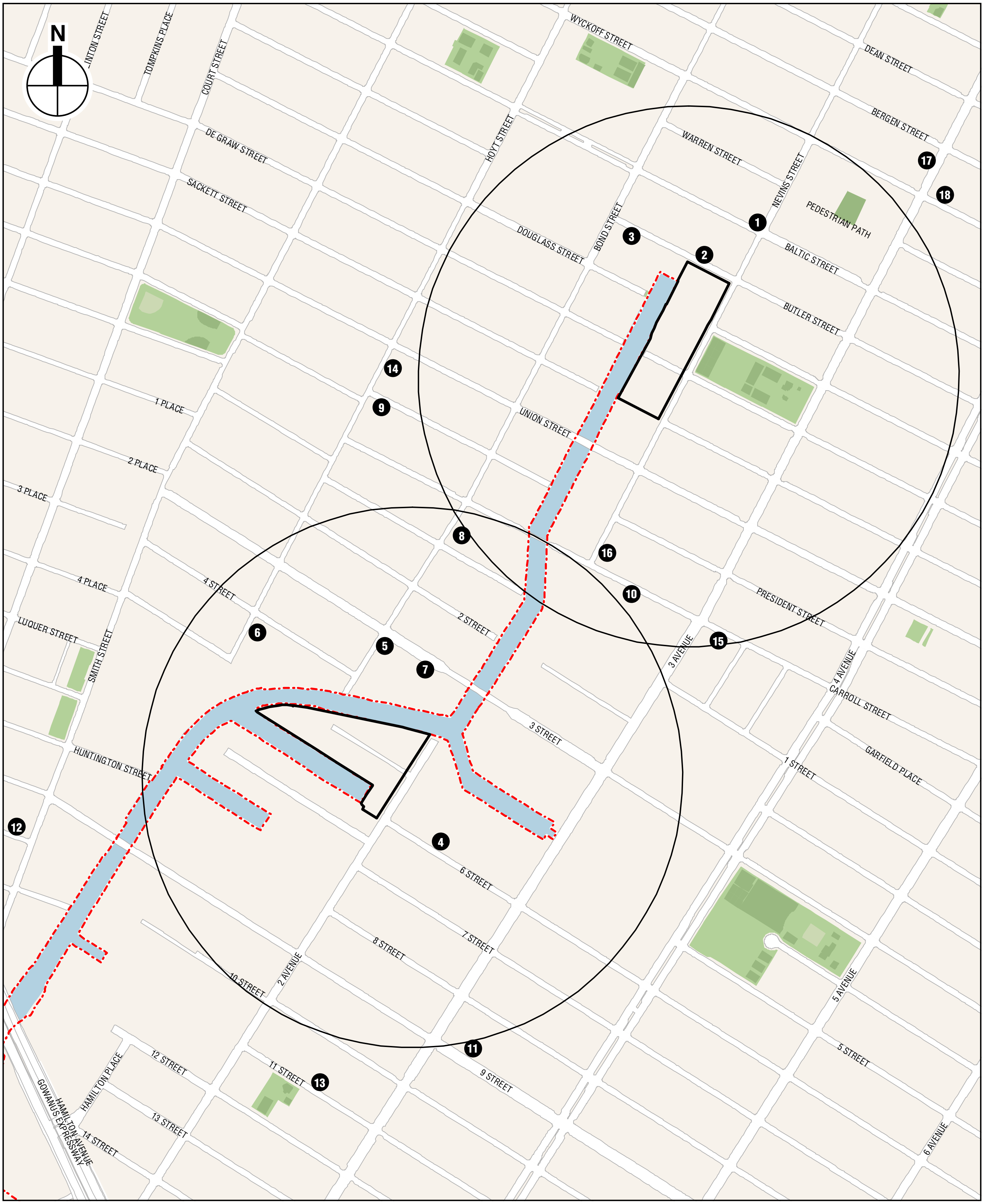
Overall, the levels of service analysis indicates that most of the study area's intersection approaches/lane groups operate acceptably—at mid-LOS D or better (delays of 45 seconds or less per vehicle for signalized intersections and 30 seconds or less per vehicle for unsignalized intersections) for both peak hours. Approaches/lane groups operating beyond mid-LOS D and those with v/c ratios of 0.90 or greater are listed below.

- Eastbound left-turn at the 9th Street and 3rd Avenue intersection (LOS E with a v/c ratio of 0.47 and a delay of 69.4 seconds per vehicle [spv] during the weekday AM peak hour; and LOS E with a v/c ratio of 0.60 and a delay of 72.0 spv during the weekday PM peak hour);
- Eastbound through/right-turn at the 9th Street and 3rd Avenue intersection (LOS D with a v/c ratio of 0.54 and a delay of 47.8 spv during the weekday PM peak hour); and
- Westbound through/right-turn at the 9th Street and 3rd Avenue intersection (LOS F with a v/c ratio of 1.05 and a delay of 108.0 spv during the weekday AM peak hour; and LOS E with a v/c ratio of 0.92 and a delay of 77.9 spv during the weekday PM peak hour).

THE FUTURE WITHOUT THE PROJECT

The Future without the Project condition was developed by increasing 2016 existing traffic levels by the expected growth in overall travel through and within the study area. As discussed above, it is anticipated that the peak construction period at both Project Sites would occur during CP-2, which would occur from the third quarter of 2023 to the first quarter of 2024. In order to present a conservative analysis, the first quarter of 2024 was assumed to be the peak construction period when background traffic would be at its highest. As per *CEQR Technical Manual* guidelines, an annual background growth rate of 0.50 percent was assumed for the first five years (year 2017 to year 2021) and then 0.25 percent for the remaining years (year 2022 to year 2024). A total of 18 planned projects expected to occur in the Future Without the Project condition were identified as being planned for the ¼-mile study area from both Project Sites (see **Figure 20-12**). After reviewing each of the planned projects, it was determined that background growth will address the increase in traffic levels for 10 of the small- to moderate-sized projects in the study area. In order to take into consideration characteristics that are unique to specific uses and geographic locations, multiple sources were used to develop trip estimates and assign the projected trips to the study area intersections for the other planned projects. For a conservative analysis, the commuter peak hour (i.e., 8:00 AM to 9:00 AM and 5:00 PM to 6:00 PM) trip increments from these projects were

6/19/2017



Project Sites

Gowanus Canal

Study Area (Quarter-Mile Boundary)

Planned Project

Gowanus Canal CSO Facilities

2024 Planned Projects

Figure 20-12

incorporated for analysis, even though the trip generation for these projects would be relatively lower during the construction peak analysis hours of 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM. **Table 20-13** and **Figure 20-12** summarize the projects that were accounted for in the Future Without the Project condition in the 2024 peak analysis year, including those that were considered as part of the study area background growth.

Table 20-13
Planned Projects Expected to be Complete by 2024

Map Ref. No.[1]	Project Name/Address	Development Program	Transportation Assumptions[2]
1	489 Baltic Street	Hotel: 15 rooms	Included in background growth
2	239 Butler Street	Hotel: 162 rooms	Transportation assumptions from *CEQR Technical Manual* and *Atlantic Yards FSEIS* (2014)
3	188 Butler Street	Office: 4,628 gsf [(2)]	Included in background growth
4	163 6th Street	Storage Facility: 76,248 gsf	Transportation assumptions from *No. 7 Subway Extension* (2004)
5	124 3rd Street	Office: 60,000 gsf	Transportation assumptions from *CEQR Technical Manual*, *Atlantic Yards FSEIS* (2014), and U.S. Census Bureau American Community Survey 2006–2010 Reverse Journey to Work estimates
6	62 4th Street	Retail: 17,224 gsf	Transportation assumptions from *CEQR Technical Manual* and *Admirals Row Plaza FEIS* (2011)
7	148 3rd Street	Office: 16,303 gsf Manufacturing: 51,624 gsf	Transportation assumptions from *CEQR Technical Manual*, *Atlantic Yards FSEIS* (2014), *Admirals Row Plaza FEIS* (2011), and U.S. Census Bureau American Community Survey 2006–2010 Reverse Journey to Work estimates
8	363-365 Bond Street	Residential: 700 units Retail: 2,600 gsf Community Facility: 2,250 gsf	Transportation assumptions from *363-365 Bond Street FEIS* (2009)
9	355 President Street	Residential: 1 unit	Included in background growth
10	454 Carroll Street	Manufacturing: 10,469 gsf	Included in background growth
11	217 9th Street	Residential: 13 units Community Facility: 2,990 gsf	Included in background growth
12	41 Garnet Street	Residential: 9 units	Included in background growth
13	147 11th Street	Office: 5,000 gsf	Included in background growth
14	P.S. 32 Expansion (317 Hoyt Street)	P.S. Expansion: 199 students	Transportation assumptions from *CEQR Technical Manual*, *SCA P.S. 32* (2012), and U.S. Census Bureau American Community Survey 2006–2010 Reverse Journey to Work estimates
15	497 Carroll Street	Retail: 1,786 gsf Manufacturing: 96,572 gsf	Transportation assumptions from *CEQR Technical Manual*, *Atlantic Yards FSEIS* (2014), and *Admirals Row Plaza FEIS* (2011)
16	341 Nevins Street	Office: 8,000 gsf	Included in background growth
17	98 3rd Avenue	Residential: 19 units Retail: 3,310 gsf	Included in background growth
18	8 St Mark's Place	Residential: 8 units Retail: 485 gsf	Included in background growth

Notes:
1. See **Figure 20-12.**
2. In order to take into consideration characteristics that are unique to specific uses and geographic locations, multiple sources were used to develop trip estimates and assign the projected trips to the study area intersections.
3. gsf: gross square feet

TRAFFIC OPERATIONS

The Future without the Project condition traffic volumes are shown in **Figures 20-13 and 20-14** for the weekday 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours. The traffic volumes were projected by layering on top of the existing traffic volumes the following: background growth and trips generated by discrete planned projects in the area. A summary of the traffic analysis results in the Future Without the Project in the 2024 analysis year is presented in **Table 20-14**. Details on level-of-service (LOS), v/c ratios, and average delays are presented in **Tables 20-15 and 20-16**.

Table 20-14
Traffic Analysis Results in the Future Without the Project in 2024

Level of Service	Analysis Peak Hours Weekday AM (7:00 AM to 8:00 AM)	Weekday PM (3:00 PM to 4:00 PM)
Lane Groups at LOS A/B/C	21	19
Lane Groups at LOS D	2	4
Lane Groups at LOS E	1	0
Lane Groups at LOS F	1	2
Total	25	25
Lane Groups with v/c ≥ 0.90	1	1
Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio.		

Based on the analysis results presented in **Tables 20-15 and 20-16**, the majority of the approaches/lane-groups in the Future Without the Project condition will operate at the same LOS as in the existing conditions or within acceptable mid-LOS D or better (delays of 45 seconds or less per vehicle for signalized intersections and 30 seconds or less per vehicle for unsignalized intersections) for both peak hours. The following approaches/lane-groups in the Future Without the Project condition are expected to operate at deteriorated LOS when compared to the existing conditions:

- Eastbound left-turn at the 9th Street and 3rd Avenue intersection will deteriorate to LOS F with a v/c ratio of 0.68 and a delay of 84.9 seconds per vehicle (spv) during the weekday PM peak hour;
- Westbound left-turn at the 9th Street and 3rd Avenue intersection will deteriorate within LOS D with a v/c ratio of 0.32 and a delay of 45.7 spv during the weekday PM peak hour; and
- Westbound through/right-turn at the 9th Street and 3rd Avenue intersection will deteriorate to LOS F with a v/c ratio of 0.95 and a delay of 83.3 spv during the PM peak hour.

Project Sites

Gowanus Canal

2024 Future Without The Project Traffic Volumes
7-8 AM Peak Hour
Figure 20-13

Project Sites

Gowanus Canal

2024 Future Without The Project Traffic Volumes
3-4 PM Peak Hour
Figure 20-14

Table 20-15
2016 Existing and Future without the Project in 2024 Level of Service Analysis
Signalized Intersections

	Weekday AM								Weekday PM							
	2016 Existing				2024 Without Project				2016 Existing				2024 Without Project			
Intersection	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Butler Street and 3rd Avenue																
WB	LTR	0.27	23.9	C	LTR	0.29	24.3	C	LTR	0.45	41.8	D	LTR	0.49	42.9	D
NB	LT	0.37	19.3	B	LT	0.39	19.6	B	LT	0.50	12.1	B	LT	0.55	13.0	B
SB	TR	0.31	18.9	B	TR	0.35	19.7	B	TR	0.38	10.0	B	TR	0.40	10.4	B
	Intersection		20.1	C	Intersection		20.5	C	Intersection		16.6	B	Intersection		17.5	B
Sackett Street and 3rd Avenue																
EB	LTR	0.16	25.6	C	LTR	0.16	25.7	C	LTR	0.43	40.6	D	LTR	0.44	40.9	D
NB	TR	0.35	16.2	B	TR	0.37	16.4	B	TR	0.56	13.5	B	TR	0.59	14.2	B
SB	LT	0.28	15.7	B	LT	0.32	16.3	B	LT	0.46	11.8	B	LT	0.49	12.4	B
	Intersection		16.9	B	Intersection		17.2	B	Intersection		17.0	B	Intersection		17.5	B
9th Street and 2nd Avenue																
EB	L	0.14	12.5	B	L	0.15	12.9	B	L	0.14	12.2	B	L	0.17	13.0	B
	TR	0.31	13.1	B	TR	0.32	13.2	B	TR	0.39	14.0	B	TR	0.40	14.1	B
WB	L	0.06	10.8	B	L	0.07	10.8	B	L	0.09	11.1	B	L	0.09	11.1	B
	TR	0.70	20.3	C	TR	0.73	21.2	C	TR	0.68	19.5	B	TR	0.74	22.0	C
NB	LTR	0.21	12.1	B	LTR	0.22	12.1	B	LTR	0.22	12.1	B	LTR	0.23	12.2	B
SB	LTR	0.17	11.7	B	LTR	0.19	11.9	B	LTR	0.30	12.9	B	LTR	0.38	13.9	B
	Intersection		16.5	B	Intersection		17.0	B	Intersection		15.8	B	Intersection		17.1	B
9th Street and 3rd Avenue																
EB	L	0.47	69.4	E	L	0.49	71.5	E	L	0.60	72.0	E	L	0.68	84.9	F
	TR	0.41	44.7	D	TR	0.42	45.0	D	TR	0.54	47.8	D	TR	0.55	48.3	D
WB	L	0.23	42.0	D	L	0.24	42.2	D	L	0.31	45.0	D	L	0.32	45.7	D
	TR	1.05	108.0	F	TR	1.08	119.2	F	TR	0.92	77.9	E	TR	0.95	83.3	F
NB	L	0.20	12.4	B	L	0.22	12.7	B	L	0.14	11.8	B	L	0.16	12.4	B
	TR	0.47	14.9	B	TR	0.52	15.8	B	TR	0.38	13.6	B	TR	0.41	14.0	B
SB	L	0.10	11.4	B	L	0.12	11.9	B	L	0.21	12.9	B	L	0.23	13.4	B
	TR	0.42	14.8	B	TR	0.45	15.4	B	TR	0.61	18.7	B	TR	0.69	21.4	C
	Intersection		37.1	D	Intersection		38.9	D	Intersection		32.0	C	Intersection		33.6	C

Table 20-16
2016 Existing and Future without the Project in 2024 Level of Service Analysis
Unsignalized Intersections

	Weekday AM								Weekday PM							
	2016 Existing				2024 Without Project				2016 Existing				2024 Without Project			
Intersection	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Butler Street and Nevins Street																
WB	LT	0.44	8.9	A	LT	0.46	9.1	A	LT	0.42	9.3	A	LT	0.46	9.8	A
SB	TR	0.36	8.3	A	TR	0.39	8.4	A	TR	0.52	9.9	A	TR	0.55	10.4	B
Degraw Street and Nevins Street																
WB	LT	0.06	9.7	A	LT	0.06	9.7	A	LT	0.09	10.9	B	LT	0.10	11.0	B
EB	R	0.01	9.7	A	R	0.01	9.7	A	R	0.02	9.7	A	R	0.02	9.7	A
6th Street and 2nd Avenue																
WB	LR	0.09	9.3	A	LR	0.12	9.4	A	LR	0.15	9.6	A	LR	0.21	9.9	A

THE FUTURE WITH THE PROJECT

Overall, the Project was projected to generate 46 and 40 construction-related vehicle trips between 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM, respectively. The incremental construction worker automobile trips were assigned to nearby available on-street parking spaces, within a ¼-mile radius of the Project Sites. All delivery trips were assigned to and from the sites via NYCDOT-designated truck routes. The incremental construction-related vehicle trips are shown in **Figures 20-15 and 20-16** for the weekday 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours.

TRAFFIC OPERATIONS

The Future With the Project in the 2024 analysis year traffic volumes are shown in **Figures 20-17 and 20-18** for the weekday 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours. The traffic volumes were constructed by layering on top of the Future without the Project traffic volumes the incremental vehicle trips shown in **Figures 20-15 and 20-16**. A summary of the Future With the Project in the 2024 analysis year traffic analysis results is presented in **Table 20-17**. Details on level-of-service, v/c ratios, and average delays are presented in **Table 20-18 and 20-19**.

Table 20-17
Traffic Analysis Results in the Future With the Project in 2024

Level of Service	Analysis Peak Hours: Weekday AM (7:00 AM to 8:00 AM)	Weekday PM (3:00 PM to 4:00 PM)
Lane Groups at LOS A/B/C	21	19
Lane Groups at LOS D	2	4
Lane Groups at LOS E	1	0
Lane Groups at LOS F	1	2
Total	25	25
Lane Groups with v/c ≥ 0.90	1	1

Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio.

As shown, none of the approaches/lane-groups in the Future with the Project are expected to operate at deteriorated LOS when compared to the Future without the Project.

Based on the analysis results presented in **Tables 20-18 and 20-19**, the Project would not result in any significant adverse traffic impacts during construction. It should be noted that construction of the Project may also necessitate the temporary use of Sackett Street between Nevins Street and the Gowanus Canal for construction staging. If deemed necessary, agreements would be made with the adjacent properties to temporarily close off this street segment. Since it essentially operates as a private drive, serving minimal volumes of traffic throughout the day, the displacement of existing activities from this street and dispersing them onto the surrounding roadways is not expected to result in any perceptible changes to the area's traffic levels and circulation patterns. Hence, the analysis results presented and conclusions made above would not be materially different if this temporary street closure is determined to be warranted. Nevertheless, if the closure of Sackett Street exceeds 180 days and if deemed necessary, a Community Reassessment Impact and Amelioration (CRIA) Statement[6] would be prepared to assess the effects of the

[6] A CRIA is a form of an Environmental Assessment Statement (EAS) that specifically addreses temporary roadway closures that last more than 180 days.

Project Sites

Gowanus Canal

2024 Total Construction Traffic Increments
7-8 AM Peak Hour

Project Sites

Gowanus Canal

2024 Total Construction Traffic Increments
3-4 PM Peak Hour
Figure 20-16

Project Sites

Gowanus Canal

2024 Future With The Project Traffic Volumes
7-8 AM Peak Hour

Gowanus Canal CSO Facilities

Figure 20-17

2024 Future With The Project Traffic Volumes
3-4 PM Peak Hour
Figure 20-18

temporary roadway closure on area traffic patterns and determine if such closure has the potential for significant adverse traffic impacts.

Table 20-18
Future with and without the Project in 2024 Conditions Level of Service Analysis
Signalized Intersections

Intersection	Weekday AM								Weekday PM							
	2024 Without Project				2024 With Project				2024 Without Project				2024 With Project			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Butler Street and 3rd Avenue																
WB	LTR	0.29	24.3	C	LTR	0.29	24.3	C	LTR	0.49	42.9	D	LTR	0.50	43.2	D
NB	LT	0.39	19.6	B	LT	0.40	19.7	B	LT	0.55	13.0	B	LT	0.56	13.3	B
SB	TR	0.35	19.7	B	TR	0.35	19.7	B	TR	0.40	10.4	B	TR	0.40	10.4	B
	Intersection		20.5	C	Intersection		20.6	C	Intersection		17.5	B	Intersection		17.7	B
Sackett Street and 3rd Avenue																
EB	LTR	0.16	25.7	C	LTR	0.19	26.0	C	LTR	0.44	40.9	D	LTR	0.47	41.8	D
NB	TR	0.37	16.4	B	TR	0.37	16.5	B	TR	0.59	14.2	B	TR	0.59	14.3	B
SB	LT	0.32	16.3	B	LT	0.32	16.3	B	LT	0.49	12.4	B	LT	0.49	12.4	B
	Intersection		17.2	B	Intersection		17.4	B	Intersection		17.5	B	Intersection		17.9	B
9th Street and 2nd Avenue																
EB	L	0.15	12.9	B	L	0.16	13.0	B	L	0.17	13.0	B	L	0.17	13.1	B
	TR	0.32	13.2	B	TR	0.32	13.2	B	TR	0.40	14.1	B	TR	0.40	14.1	B
WB	L	0.07	10.8	B	L	0.07	10.8	B	L	0.09	11.1	B	L	0.09	11.1	B
	TR	0.73	21.2	C	TR	0.74	21.7	C	TR	0.74	22.0	C	TR	0.76	22.5	C
NB	LTR	0.22	12.1	B	LTR	0.23	12.2	B	LTR	0.23	12.2	B	LTR	0.24	12.3	B
SB	LTR	0.19	11.9	B	LTR	0.22	12.1	B	LTR	0.38	13.9	B	LTR	0.40	14.3	B
	Intersection		17.0	B	Intersection		17.2	B	Intersection		17.1	B	Intersection		17.4	B
9th Street and 3rd Avenue																
EB	L	0.49	71.5	E	L	0.49	71.5	E	L	0.68	84.9	F	L	0.69	86.7	F
	TR	0.42	45.0	D	TR	0.44	45.4	D	TR	0.55	48.3	D	TR	0.57	48.8	D
WB	L	0.24	42.2	D	L	0.24	42.4	D	L	0.32	45.7	D	L	0.33	46.0	D
	TR	1.08	119.2	F	TR	1.09	120.9	F	TR	0.95	83.3	F	TR	0.96	84.9	F
NB	L	0.22	12.7	B	L	0.23	12.9	B	L	0.16	12.4	B	L	0.18	12.6	B
	TR	0.52	15.8	B	TR	0.52	15.8	B	TR	0.41	14.0	B	TR	0.41	14.1	B
SB	L	0.12	11.9	B	L	0.12	11.9	B	L	0.23	13.4	B	L	0.23	13.4	B
	TR	0.45	15.4	B	TR	0.46	15.5	B	TR	0.69	21.4	C	TR	0.69	21.5	C
	Intersection		38.9	D	Intersection		39.3	D	Intersection		33.6	C	Intersection		34.0	C

Table 20-19
Future with and without the Project in 2024 Conditions Level of Service Analysis
Unsignalized Intersections

Intersection	Weekday AM								Weekday PM							
	2024 Without Project				2024 With Project				2024 Without Project				2024 With Project			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Butler Street and Nevins Street																
WB	LT	0.46	9.1	A	LT	0.47	9.2	A	LT	0.46	9.8	A	LT	0.46	9.9	A
SB	TR	0.39	8.4	A	TR	0.40	8.6	A	TR	0.55	10.4	B	TR	0.56	10.5	B
Degraw Street and Nevins Street																
WB	LT	0.06	9.7	A	LT	0.06	9.8	A	LT	0.10	11.0	B	LT	0.10	11.2	B
EB	R	0.01	9.7	A	R	0.01	9.8	A	R	0.02	9.7	A	R	0.02	9.8	A
6th Street and 2nd Avenue																
WB	LR	0.12	9.4	A	LR	0.12	9.6	A	LR	0.21	9.9	A	LR	0.21	10.1	B

VEHICULAR AND PEDESTRIAN SAFETY EVALUATION

ACCIDENT DATA

In accordance with the *CEQR Technical Manual*, accident data for the study area intersections were obtained from the New York State Department of Transportation (NYSDOT) for a 3-year period from January 1, 2014, through December 31, 2016. The accident data quantifies the total number of reportable accidents and crashes (involving fatality, injury, or more than $1,000 in property damage), fatalities, and injuries during the study period, as well as a yearly breakdown of vehicular crashes with pedestrians and bicycles at each location.

During the January 1, 2014 and December 31, 2016 three-year period, a total of 238 reportable and non-reportable crashes, one fatality, 209 injuries, and 86 pedestrian/bicyclist-related crashes occurred at the study area intersections. A rolling total of crash data identifies one study area intersection, 4th Avenue at Union Street, as a high crash location in the 2014 to 2016 study period. **Table 20-20** summarizes total crash characteristics by intersection during the study period, as well as a breakdown of pedestrian and bicycle crashes by year and location.

Table 20-20
Accident Summary

Intersection		Study Period					Accidents by Year					
North-South Roadway	East-West Roadway	All Accidents by Year			Total Fatalities	Total Injuries	Pedestrian			Bicycle		
		2014	2015	2016			2014	2015	2016	2014	2015	2016
2nd Avenue	5th Street	0	1	0	0	0	0	0	0	0	0	0
2nd Avenue	6th Street	3	0	0	0	4	1	0	0	0	0	0
2nd Avenue	7th Street	1	0	0	0	1	1	0	0	0	0	0
2nd Avenue	9th Street	2	5	2	0	8	0	0	0	0	4	1
3rd Avenue	1st Street	2	0	1	0	2	0	0	0	0	0	0
3rd Avenue	3rd Street	4	4	4	0	9	1	1	0	0	1	0
3rd Avenue	6th Street	3	1	2	0	2	0	0	0	0	0	0
3rd Avenue	7th Street	3	0	3	1	6	0	0	0	0	0	0
3rd Avenue	8th Street	1	1	1	0	1	0	0	0	0	0	0
3rd Avenue	9th Street	7	3	4	0	16	3	1	3	1	0	0
3rd Avenue	Baltic Street	5	2	1	0	5	1	0	0	2	0	0
3rd Avenue	Bergen Street	2	4	1	0	9	0	1	0	1	1	1
3rd Avenue	Butler Street	1	2	2	0	5	0	0	0	1	0	1
3rd Avenue	Carroll Street	2	0	1	0	4	0	0	1	0	0	0
3rd Avenue	Degraw Street	2	0	1	0	4	0	0	0	1	0	0
3rd Avenue	Douglass Street	1	0	2	0	2	0	0	0	0	0	0
3rd Avenue	President Street	1	1	1	0	1	0	0	0	0	1	0
3rd Avenue	Sackett Street	1	1	1	0	3	0	0	0	0	0	1
3rd Avenue	Saint Marks Place	1	3	0	0	4	1	2	0	0	0	0
3rd Avenue	Union Street	4	4	3	0	12	0	0	2	1	0	0
3rd Avenue	Warren Street	1	0	1	0	2	0	0	0	0	0	1
3rd Avenue	Wyckoff Street	1	3	2	0	7	0	0	0	0	1	2
4th Avenue	Baltic Street	0	2	2	0	1	0	0	0	0	0	0
4th Avenue	Butler Street	0	0	2	0	2	0	0	0	0	0	1
4th Avenue	Degraw Street	6	3	1	0	5	0	2	0	1	0	0
4th Avenue	Douglass Street	4	3	0	0	6	0	0	0	0	0	0
4th Avenue	President Street	1	3	0	0	5	1	1	0	0	0	0
4th Avenue	Sackett Street	2	0	2	0	3	0	0	0	0	0	0
4th Avenue	Saint Marks Place	0	2	2	0	3	0	0	1	0	1	0
4th Avenue	**Union Street**	14	7	16	0	38	1	3	4	4	0	2
4th Avenue	Warren Street	1	1	0	0	2	1	0	0	0	0	0
Bond Street	3rd Street	2	0	4	0	3	0	0	0	0	0	3
Bond Street	4th Street	0	1	1	0	0	0	0	0	0	0	0
Bond Street	Baltic Street	3	0	2	0	6	1	0	0	0	0	0
Bond Street	Butler Street	1	3	2	0	6	1	1	2	0	1	0
Bond Street	Carroll Street	3	0	3	0	4	1	0	0	1	0	0
Bond Street	President Street	0	1	0	0	0	0	0	0	0	0	0
Bond Street	Union Street	0	2	2	0	4	0	0	0	0	1	2
Bond Street	Warren Street	0	0	1	0	1	0	0	0	0	0	0
Nevins Street	Baltic Street	1	1	2	0	4	0	0	0	0	0	2
Nevins Street	Butler Street	1	0	0	0	1	0	0	0	1	0	0
Nevins Street	Carroll Street	0	1	0	0	0	0	0	0	0	0	0
Nevins Street	Douglass Street	1	0	0	0	1	0	0	0	1	0	0
Nevins Street	President Street	0	1	0	0	0	0	0	0	0	0	0
Nevins Street	Union Street	2	2	1	0	5	0	0	1	1	0	0
Nevins Street	Wyckoff Street	2	0	2	0	2	0	0	1	1	0	0

Source: NYSDOT January 1, 2014 to December 31, 2016 accident data.
Bold intersections are high pedestrian accident locations.

Table 20-21 shows a detailed description of each pedestrian/bicyclist-related accident at 4th Avenue and Union Street, the highest accident location listed above during the 3-year study period.

Table 20-21
Vehicle and Pedestrian Accident Details

Intersection	Year	Date	Time	Accident Class		Action of Vehicle	Action of Pedestrian	Cause of Accident			
				Injured	Killed			Left / Right Turns	Pedestrian Error/ Confusion	Driver Inattention	Other
4th Avenue @ Union Street	2014	4/16	10:40AM	X		Going straight – North	Along highway with traffic			X	
		4/23	10:05AM	X		Going straight – North	Unknown				Traffic control devices disregarded
		6/4	5:40PM	X		Going straight – North	Crossing against signal		X		Traffic control devices disregarded
		9/4	10:50AM	X		Making right turn – East	Not in roadway	X			Oversized vehicle
		11/5	12:38PM	X		Going straight – North	Crossing with signal				Failure to yield R.o.W.
	2015	4/1	8:15AM	X		Going straight – South	Other actions in roadway		X	X	
		11/19	9:36PM	X		Going straight – East	Crossing against signal		X		
		11/27	5:50PM	X		Making left turn – Southwest	Crossing with signal	X			Reaction to other uninvolved vehicle
	2016	1/9	3:00AM	X		Going straight – East	Crossing against signal				Alcohol involvement
		2/9	11:21PM	X		Making left turn – West	Crossing with signal	X			Failure to yield R.o.W.
		7/20	10:00AM	X		Making left turn – South	Crossing with signal	X			Failure to yield R.o.W.
		8/30	5:29PM	X		Making left turn – North	Unknown	X			Failure to yield R,o.W.
		10/7	5:20PM	X		Making left turn – Southeast	Crossing with signal	X	X		Failure to yield R.o.W.
		11/18	9:21AM	X		Going straight – North	Crossing against signal		X		Failure to yield R.o.W.

4TH AVENUE AND UNION STREET

Based on the review of the accident history at the intersection of 4th Avenue and Union Street, no prevailing trends with regard to geometric deficiencies were identified as the primary causes of recorded accidents. With respect to geometric deficiencies that could potentially cause safety hazards, the intersection of 4th Avenue and Union Street is signalized and provides four high visibility crosswalks. In addition, countdown timers are present on the north and south crosswalks; regular signals are present on the east and west crosswalks.

CONSTRUCTION TRANSPORTATION ANALYSIS CONCLUSION

In consultation with DEP, a detailed traffic analysis was performed at seven locations during the 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM peak hours during the peak construction quarter of CP-2 in 2024. Analyses performed for these locations showed that the Project would not result in any significant adverse transportation impacts during construction.

D. CONSTRUCTION AIR QUALITY

INTRODUCTION

The construction of the Project requires the use of both nonroad construction equipment and on-road vehicles. Nonroad construction equipment includes equipment operating on-site such as cranes, loaders, excavators, and dozers. On-road vehicles include construction delivery trucks, dump trucks, and worker vehicles arriving to and departing from the construction site as well as operating on-site.

Emissions from nonroad construction equipment and on-road vehicles have the potential to affect air quality. In addition, emissions from dust-generating construction activities (i.e., truck loading and unloading operations) and vapor emissions generated from the groundwater treatment process also have the potential to affect air quality.

A quantitative analysis was performed to determine the potential for significant adverse impacts from these sources of air emissions generated during construction of the Project. The 2014 *CEQR Technical Manual* procedures were used for the analysis.

METHODOLOGY

CRITERIA POLLUTANTS

As required by the Clean Air Act, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, respirable particulate matter (PM) [both $PM_{2.5}$ and PM_{10}], sulfur dioxide (SO_2), and lead. The NAAQS and associated averaging times are presented in **Table 15-1,** in Chapter 15, "Air Quality". In general, much of the heavy equipment used in construction is powered by diesel engines that have the potential to produce relatively high levels of nitrogen oxides (NO_x) and PM emissions. Fugitive dust generated by construction activities is also a source of PM emissions and gasoline engines produce relatively high levels of CO. Since USEPA mandates the use of ultra-low sulfur diesel (ULSD)[7] fuel for all highway and nonroad diesel engines and New York City Local Law 77 mandates the use of ULSD fuel for nonroad equipment used on City construction projects, sulfur oxides (SO_x) emitted from the Project's construction activities would be negligible.[8] Therefore, the pollutants analyzed for the construction period were NO_2, the component of NO_x that is a regulated pollutant, along with PM_{10}, $PM_{2.5}$, and CO.

NO_2, CO, $PM_{2.5}$, and PM_{10} emissions from on-site construction equipment were evaluated. CO and PM_{10}/$PM_{2.5}$ emissions from on-road vehicles and PM_{10}/$PM_{2.5}$ emissions from fugitive dust generating activities were also evaluated.

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[7] USEPA required a major reduction in the sulfur content of diesel fuel intended for use in locomotive, marine, and nonroad engines and equipment, including construction equipment. As of 2015, the diesel fuel produced by all large refiners, small refiners, and importers must be ULSD fuel, with sulfur levels in nonroad diesel fuel limited to a maximum of 15 parts per million.

[8] New York York City Administrative Code § 24-163.3, adopted December 22, 2003, also known as Local Law 77, requires that any diesel-powered nonroad engine with a power output of 50 hp or greater shall be powered by ULSD, and utilize the Best Available Technology (BAT) for reducing the emission of pollutants, primarily PM and secondarily NO_x. This requirement applies to all City-owned nonroad diesel vehicles and engines and any privately owned diesel vehicles and engines used on construction projects funded by the City.

1-Hour NO_2

With the promulgation of the 2010 1-hour average NAAQS for NO_2, local ground-level sources, such as on-site construction sources, may be of concern for this pollutant. However, construction effects are temporary in nature and would not persist at a single location. The monthly and annual variation in the types of equipment needed on the construction site and the utilization of the equipment would fluctuate on an hourly basis. In addition, the statistical basis of the 1-hour NO_2 standard (a three-year statistical average of modeled concentrations), unlike the other pollutants and the corresponding averaging periods modeled in the construction analysis, such as $PM_{2.5}$ 24-hour and NO_2 annual averaging periods, make it difficult to accurately model construction sources which would move throughout the Project Sites over the entire construction period as opposed to sources that operate on a regular basis in a defined location such as an exhaust stack on a building. USEPA guidance on modeling 1-hour NO_2 discusses intermittent emissions[9]. USEPA states that "*the intermittent nature of the actual emissions…in many cases, when coupled with the probabilistic form of the standard, could result in modeled impacts being significantly higher than actual impacts would realistically be expected to be for these emission scenarios*" Furthermore, USEPA "*recommends that compliance demonstrations for the 1-hour NO_2 NAAQS be based on emission scenarios that can logically be assumed to be relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations.*"

While the overall construction duration for the Project is expected to be approximately seven years, the construction duration for the most intense activities in terms of air quality, SOE and excavation construction stages under CP-2 discussed below is anticipated to be limited to a portion of the duration—approximately two years[10]. Other stages of construction would result in much lower air emissions since they would involve less intense activities and would require fewer pieces of heavy duty diesel equipment. Further, substantial uncertainty still exists as to 1-hour NO_2 background concentrations at ground level, especially near roadways, since these concentrations have not been adequately measured. In addition, there are no clear methods to predict the rate of transformation of NO to NO_2 at ground-level for construction sources given the level of existing data and models. Moreover, when construction of the Project commences, there would be a greater percentage of nonroad diesel engines on-site conforming to the newer USEPA emissions standards, resulting in reduced NO_x emissions during construction activities. For these reasons, a 1-hour NO_2 analysis was not conducted for construction sources.

NON-CRITERIA POLLUTANTS

In addition to the criteria pollutants discussed above, non-criteria pollutants are emitted by a wide range of man-made and naturally occurring sources. These pollutants are sometimes referred to as hazardous air pollutants (HAP).

Federal ambient air quality standards do not exist for non-criteria pollutants; however, NYSDEC has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide and has developed guideline concentrations for numerous other non-criteria pollutants. The NYSDEC Division of Air Resources guidance document, DAR-1 (August 2016), contains a compilation

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[9] USEPA Memorandum, "Additional Clarification Regarding Application of Appendix W, Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard," March 1, 2011.

[10] Note that this timeframe represents the cumulative total of DEP work at each of the Project Sites; at the Head End Site there will be a period between the initial DEP site work and when the tank is constructed when National Grid is responsible for remediation of the site, so the overall work at the site would be of longer duration.

of annual and short term (1-hour) guideline concentrations for these compounds, which represents the ambient levels that are considered safe for public exposure.

Predicted concentrations from the groundwater treatment system exhaust were compared to the short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs). Consistent with NYSDEC's DAR-1 guidance document, background levels are assumed to be zero since there is no available background data for these pollutants.

Table 20-22 shows the pollutants analyzed in the construction air quality analysis and the corresponding averaging periods.

Table 20-22
Pollutants for the Construction Air Quality Analysis and Averaging Periods

Pollutant	Averaging Period
$PM_{2.5}$	24-hour; Annual Local and Neighborhood
PM_{10}	24-hour
NO_2	Annual
CO	1-hour and 8-hour
Non-Criteria Pollutants[1]	1-hour and Annual

Note:
1. Non-criteria pollutants are only modeled from the air treatment system.

CONSTRUCTION ACTIVITY ASSESSMENT

Analysis Period

Overall, construction of the Project is expected to occur over a period of approximately seven years and, as discussed above under "Construction Phases," is separated into three distinct phases: CP-1 comprises site preparation, utility relocation, and demolition; CP-2 comprises SOE installation, site excavation, and below-grade structures construction; and CP-3 includes above-grade structures, conveyances, and outfalls construction. Because the level of construction activities would vary from phase to phase, a determination of the reasonable worst-case analysis period for the construction air quality analysis was selected based on the estimated monthly construction work schedule, equipment to be employed and their usage factors, and equipment emission rates. The periods of highest emissions nearest to sensitive receptor locations are expected to be the periods of greatest impacts. Based on these factors, it is anticipated the peak construction period in terms of air quality at both the Head End and Owls Head Sites would occur during SOE and excavation activities under the CP-2 construction phase where a greater number of heavy diesel equipment such as excavators and loaders would be employed simultaneously in proximity to nearby sensitive receptor locations. It was conservatively assumed that peak construction activities at both the Head End and Owls Head Sites would occur simultaneously.

The dispersion modeling analysis was performed for the reasonable worst-case annual and short-term (i.e., 24-hour, 8-hour, and 1-hour) averaging periods. The potential for significant adverse impacts was determined by comparing modeled NO_2, CO, and PM_{10} concentrations to the NAAQS, and modeled $PM_{2.5}$ and CO increments to applicable *de minimis* thresholds in the context of magnitude, duration, and locations and the size of the area affected by the concentration increment. Details on the relevant air quality regulations, standards, and guidance thresholds are presented in Chapter 15, "Air Quality."

Other less intensive construction phases such as CP-1 and CP-3 are discussed qualitatively, based on the reasonable worst-case analysis period results.

Construction Emission Sources

Construction emissions sources include nonroad construction equipment, on-road vehicles and dust-generating construction activities. A list of the nonroad construction equipment and on-road vehicles that would likely be operated during the modeled reasonable worse-case analysis period, CP-2, are provided below in **Tables 20-23 and 20-24**, along with the equipment engine type, estimated engine size, quantity, and daily and average usage factors for each type of equipment. This information was used to calculate the emissions generated from the likely construction activities during the reasonable worse-case analysis period.

Table 20-23
CP-2 SOE and Excavation Activities Construction Equipment List – Head End Site

Construction Task	Equipment	Engine Type	Engine Size (HP)	Quantity	Daily Usage Factor[1]	Average Usage Factor[2]
SOE Installation	Clamshell Excavator	diesel	250	1	80%	62%
SOE Installation	Hydromill Excavator	diesel	250	1	80%	62%
SOE Installation	Slurry Mixer	electric	-	1	80%	62%
SOE Installation	Dewatering Pump	electric	100A	2	80%	50%
SOE Installation	Crane (Large)	diesel	400	2	80%	50%
SOE Installation	Crane (Small)	diesel	285	1	80%	62%
SOE Installation	Concrete Trucks	20/day				
SOE Installation	Dump Trucks/Tractor Trailers	10/day				
Excavation	Backhoe	diesel	144	2	80%	50%
Excavation	Cat 324 Excavator	diesel	188	2	80%	62%
Excavation	Skid Steer Loader	diesel	85	2	80%	50%
Excavation	Cat 450 Excavator	diesel	144	2	80%	62%
Excavation	724K Wheel Loader (5 cy)	diesel	264	2	80%	62%
Excavation	JD550 Dozer	diesel	92	2	80%	62%
Excavation	Dewatering Pump	electric	100A	2	80%	50%
Excavation	Dump Trucks	100/day				

Notes:
[1]The daily usage factor is the percentage of time the specific piece of equipment would be in use during a typical 10-hour workday assumed in the analysis.
[2]The average usage factor is the percentage of time the specific piece of equipment would be in use during the overall duration of CP-2, the reasonable worse-case analysis period.
Source: Brown and Caldwell, April 2017

Table 20-24
CP-2 SOE and Excavation Activities Construction Equipment List – Owls Head Site

Construction Task	Equipment	Engine Type	Engine Size (HP)	Quantity	Daily Usage Factor[1]	Average Usage Factor[2]
SOE Installation	Clamshell Excavator	diesel	250	1	80%	62%
SOE Installation	Hydromill Excavator	diesel	250	1	80%	62%
SOE Installation	Slurry Plant	electric	-	1	80%	62%
SOE Installation	Dewatering Pump	electric	100A	2	80%	50%
SOE Installation	Crane (Large)	diesel	400	2	80%	50%
SOE Installation	Crane (Small)	diesel	285	1	80%	62%
SOE Installation	Concrete Trucks	20/day				
SOE Installation	Dump Trucks/Tractor Trailers	10/day				
Excavation	Backhoe	diesel	144	2	80%	50%
Excavation	Cat 324 Excavator	diesel	188	2	80%	62%
Excavation	Skid Steer Loader	diesel	85	2	80%	50%
Excavation	Cat 450 Excavator	diesel	144	2	80%	62%
Excavation	724K Wheel Loader (5 cy)	diesel	264	2	80%	62%
Excavation	JD550 Dozer	diesel	92	2	80%	62%
Excavation	Dewatering Pump	electric	100A	2	80%	50%
Excavation	Dump Trucks	100/day				

Notes:
[1]The daily usage factor is the percentage of time the specific piece of equipment would be in use during a typical workday.
[2]The annual average usage factor is the percentage of time the specific piece of equipment would be in use during the overall duration of CP-2, the reasonable worse-case analysis period.
Source: Brown and Caldwell, April 2017

Nonroad Construction Equipment

Nonroad construction equipment includes equipment operating on-site, such as cranes, loaders, excavators, and dozers. Emission rates for NO_x, CO, PM_{10}, and $PM_{2.5}$ from nonroad construction equipment engines were developed using the USEPA's NONROAD2008 emission model (NONROAD).[11]

On-Road Vehicles

On-road vehicles include construction worker vehicles and construction trucks arriving to and from the construction sites, as well as operating on-site. Traffic data for the construction air quality analysis was provided from projected future growth in traffic and other information developed as part of the construction traffic analysis described above for the Project. The maximum hourly incremental traffic volumes generated during the construction of the Project would not exceed the *CEQR Technical Manual* CO screening threshold of 170 peak-hour vehicle trips at one intersection in the study area or the PM emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the 2014 *CEQR Technical Manual.* Therefore, a standalone mobile-source intersection analysis for on-road vehicles is not required. Nevertheless, since emissions from nonroad construction equipment and on-road vehicles may contribute to concentration increments concurrently, both nonroad construction equipment and on-road vehicles were modeled together to address all local project-related construction emissions.

[11] NONROAD Model (Nonroad Engines, Equipment, and Vehicles) User Guide, EPA420-R-05-013, December 2005.

Vehicular engine emission factors were computed using the USEPA Motor Vehicle Emission Simulator (MOVES2014a) emission model.[12]

Fugitive Dust Generating Activities

In addition to engine emissions, fugitive dust emissions are generated from operations (e.g., transferring excavated materials into dump trucks), vehicle travel on-site, and excavated soil stockpiles. Fugitive dust emissions from operations were calculated using USEPA procedures provided in AP-42 Table 13.2.3-1.[13] Road dust emissions from vehicle travel on-site were calculated using equations from USEPA's AP-42, Section 13.2.1 for paved roads, and dust emissions from stockpiles were calculated using equations from USEPA's AP-42, Section 13.2.4.

As discussed below under "Emissions Reduction Measures," the construction of the Project is required to follow the DEP Construction Dust Rules regarding construction-related dust emissions.[14] Therefore, a 50 percent reduction in particulate emissions from fugitive dust was conservatively assumed in the calculations to account for required dust control measures that would be employed at the Projects Sites, such as wet suppression.

Emissions Reduction Measures

Measures would be taken to reduce pollutant emissions during construction of the Project in accordance with all applicable laws, regulations, and building codes. These include the following dust suppression measures and idling restrictions:

- *Dust Control.* To minimize fugitive dust emissions from construction activities, a fugitive dust control plan including a robust watering program would be required as part of contract specifications. For example, all trucks hauling loose material would be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the Project Site; and water sprays would be used for all demolition, excavation, and transfer of soils to ensure that materials would be dampened as necessary to avoid the suspension of dust into the air. Loose materials would be watered, stabilized with a chemical suppressing agent, or covered. All measures required by the DEP's *Construction Dust Rules* regulating construction-related dust emissions would be implemented.
- *Idling Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time would be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or are otherwise required for the proper operation of the engine.

Construction of the Project is subject to New York City Local Law 77, which requires the use of ULSD fuel and Best Available Technology (BAT) for equipment at the time of construction.

- *Clean Fuel*. ULSD fuel would be used exclusively for all diesel engines throughout the project area.
- *Best Available Tailpipe Reduction Technologies*. Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with

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[12] EPA, Motor Vehicle Emission Simulator (MOVES), User Guide for MOVES2014a, EPA-420-B-15-095, November 2015

[13] EPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Chapter 13: Miscellaneous Sources.

[14] http://www.nyc.gov/html/dep/html/air/construction_dust_debris.shtml

the project) including but not limited to concrete mixing and pumping trucks would utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed by the original equipment manufacturer or retrofitted. Retrofitted DPFs must be verified by USEPA or the California Air Resources Board. Active DPFs or other technologies proven to achieve an equivalent reduction may also be used.

The analysis took into account the emissions reduction measures listed above that would be implemented during construction of the Project.

Dispersion Model

Potential impacts from the Project's nonroad construction equipment, on-road vehicles, and fugitive dust generating activities were evaluated using the USEPA/AMS AERMOD model (version 16216r), a refined dispersion model. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.

Source Simulation

For short-term model scenarios (predicting concentration averages for periods of 24 hours or less), nonroad construction sources, such as idling trucks, which would likely remain at a single location on a given day, were simulated as point sources in the model. Other nonroad construction sources, such as excavators or loaders, which would move around the site on any given day, as well as on-road vehicles, were simulated as area sources in the model. For short-term averaging periods of 8 hours or less, it was assumed that all engines would be active simultaneously. For the annual analysis, because all sources are anticipated to move around the site throughout the year these sources were simulated as area sources in the model.

Meteorological Data

The meteorological data set consists of five consecutive years of meteorological data: surface data collected at John F Kennedy Airport (2012–2016), and concurrent upper air data collected at Brookhaven, New York. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevation over the five-year period. These data sets were processed using the USEPA AERMET program (version 16216) to develop data in a format which can be readily processed by the AERMOD model. The land uses around the site where meteorological surface data is available was classified using categories defined in digital United States Geological Survey (USGS) maps to determine surface parameters used by the AERMET program.

Receptor Locations

Receptors were placed at publicly accessible locations, at residential and other sensitive uses at both ground-level and elevated locations (e.g., residential windows and balconies), at adjacent sidewalk locations, and at publicly accessible open spaces including the Thomas Greene Playground and the Gowanus Canal.

Conservative analysis receptors were also placed at key locations identified as potential future residential development sites to conservatively evaluate the Project's effect on potential future land use changes.

In addition, a ground-level receptor grid extending 1 kilometer from each site was placed to enable extrapolation of concentrations near the Project Sites at locations more distant from construction activities and to capture any potential cumulative construction effects and neighborhood scale impacts from both the Head End and Owls Head Sites.

Background Concentrations

To estimate the maximum expected total pollutant concentrations, the modeled impacts from the emission sources were added to an ambient background value that accounts for existing pollutant concentrations from other sources. The background levels were based on concentrations monitored at the nearest NYSDEC ambient air monitoring stations, and were consistent with the background concentrations used for the operational stationary source air quality analysis (see Chapter 15, “Air Quality”).

Combined Impact Assessment

The construction analyses conservatively assume that peak construction activities at both the Head End and Owls Head Sites would occur simultaneously in order to capture the cumulative nature of construction impacts. The combined effect from construction activities at the Head End and Owls Head Sites were assessed within the AERMOD model and presented.

GROUNDWATER TREATMENT SYSTEM SCREENING ANALYSIS

Construction of the Project would involve subsurface disturbance at both the Head End and Owls Head Sites and a groundwater treatment system would be used during CP-2 construction to treat potentially contaminated groundwater. As discussed above, treatment processes would likely include: equalization, sedimentation, oil-water separation, metals removal, air stripping, or granular activated carbon adsorption. For the purposes of this construction analysis, based on representative groundwater sampling data, an air stripper with granulated carbon adsorption was assumed as treatment to meet groundwater discharge requirements and air quality standards and thresholds. Exhaust emissions from this potential treatment system were evaluated using a screening level analysis and assuming that vapor emissions exhausted to the atmosphere would be controlled. The Head End Site is located within National Grid’s Remedial Investigation Parcel Boundaries for the former Fulton MGP site. National Grid’s 2012 Remedial Investigation (and subsequent Interim Remedial Measures and Remedial Design process) identified coal tar and other MGP wastes in the subsurface.[15] The investigations identified the presence of volatile organic compounds (VOCs) (including benzene), semi-volatile organic compounds (SVOCs) (including naphthalene), pesticides, and metals (including lead) in groundwater samples collected. As discussed above, there is some soil and groundwater contamination at the Owls Head Site due to its industrial history. Prior to construction, further investigation of the Owls Head Site would be performed by DEP to better determine the nature of the excavated soil and groundwater; however, it is expected that the contamination would be similar to or less than the contamination at the Head End Site. Therefore, an analysis of the potential concentrations from the on-site groundwater treatment system at the Head End Site was conducted as a reasonable worst-case; potential concentrations at the Owls Head Site are expected to be similar or less.

The results of National Grid’s 2012 Remedial Investigation, specifically the non-criteria pollutants found in the July 2008 groundwater samples collected at the Head End Site (Block 418, Lot 1 and Block 411,

[15] GEI Consultants Inc., July 2012 Final Remedial Investigation Report, Fulton Municipal Works Former Manufactured Gas Plant (MGP), Brooklyn, New York.

Lot 24 were used in the analysis as representative of pollutant concentrations that could potentially be present during excavation activities. The analysis of the groundwater treatment system assumes non-criteria pollutant concentrations would be captured from contaminated water with a 99 percent control efficiency and vapor emissions would be controlled with control efficiencies ranging from no control (for non-volatile pollutants) up to a minimum of 99 percent control efficiency (for semi-volatile and volatile pollutants) from the air treatment system, depending on the pollutant, before being exhausted to the atmosphere.

The complete list of air pollutants is provided in **Appendix 20-1**, along with their concentrations. The list of non-criteria air pollutants includes aromatic compounds such as benzene, toluene, ethylbenzene, and xylene (BTEX), which are typical contaminants found in MGP wastes.

Dispersion Model

The groundwater treatment system screening analysis was performed using the USEPA-approved screening model, AERSCREEN (version 16216). AERSCREEN is a screening-level air quality model used to predict worst-case one-hour impacts downwind from a point, area, or volume source. AERSCREEN generates application-specific worst-case meteorology using representative minimum and maximum ambient air temperatures, and site-specific surface characteristics such as albedo, Bowen ratio, and surface roughness. AERSCREEN also incorporates AERMOD's complex terrain algorithms and utilizes the AERMAP (version 11103) terrain processor to account for terrain effects in the vicinity of the source on a direction-specific basis.

Persistence Factors

AESCREEN calculates 1-hour average maximum concentrations. In order to convert 1-hour concentrations to concentrations over longer averaging periods, persistence factors (averaging period ratios used to account for meteorological variability) are used. SOE installation and excavation activities are anticipated to take approximately two years to complete at each Project Site. For conversion from 1-hour averages to annual averages, an annual scaling ratio of 0.10 was used according to the AESCREEN User's Guide.[16]

Emission Rates and Stack Parameters

Non-criteria pollutant emissions were modeled using a unitary emission rate (1 gram per second [g/s]) using default stack exhaust parameters consistent with CEQR guidance to obtain maximum unitary 1-hour concentrations (micrograms per cubic meter per gram per second [μg/m3 per g/s]). The 1-hour unitary concentrations were then multiplied by the maximum pollutant emission rates exhausted from the air treatment system to obtain individual 1-hour non-criteria pollutant concentrations. As discussed above, the maximum 1-hour concentrations were then multiplied by the AERSCREEN scaling ratios to obtain the maximum annual concentrations.

Table 20-25 presents the stack exhaust parameters from the air treatment system.

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[16] AESCREEN User's Guide, EPA-454/B-16-004, December 2016.

Table 20-25
Exhaust Parameters—Air Treatment Sytem

Stack Parameters	Air Treatment System[1]
Stack Height (ft)	30
Stack Diameter (ft)	0 [2]
Exhaust Flowrate (ft/s)	0.00 [2]
Exhaust Temperature (K)	250 [3]
Stack Configuration	Vertical
Dewatering Pumping Rate (gpm) [4]	250
Groundwater Treatment Capture Control Efficiency (percent)	99
Air Stripper Control Efficiency (percent) [5]	Pollutant specific

Notes:
[1] Stack exhaust information, such as exhaust diameter and flowrate are based on similar sized air stripper units used in industry.
[2] *CEQR* default exhaust parameters used to eliminate plume rise effects were used as a conservative worst-case assumption.
[3] The default, lowest temperature within the AESCREEN model was used as a conservative assumption to minimize buoyancy effects.
[4] Average dewatering pumping rate based on current design.
[5] An air stripper control efficiency of at least 99%, 98%, 77%, and 66% was assumed for 1,2-dichloroethane, benzene, vinyl chloride, and tetrachloroethene, respectively. An air stripper is not required for the remaining pollutants; as such, a control efficiency of 0% was assumed for these pollutants.

Meteorological Data

The meteorological data used by the AERSCREEN model is generated by the MAKEMET program (version 16216) using application-specific worst-case meteorology, representative minimum and maximum ambient air temperatures, and site-specific surface characteristics such as albedo, Bowen ratio, and surface roughness to determine worst-case hourly impacts. The default minimum and maximum air temperatures of 250 K and 310 K, a default minimum wind speed of 0.5 m/s, and an anemometer height of 10 m were used in the model. Surface characteristics from the John F. Kennedy Airport meteorological station were also used.

Receptor Locations

The AERSCEEN model determines worst-case concentrations at specified minimum distances between the source and the receptor, irrespective of orientation (i.e., independent of the direction or the meteorological conditions that may affect direction). Therefore, the screening analysis included the nearest ground level receptors at the sidewalk adjacent to the project site located at a minimum distance of 3 feet away, nearby elevated receptors located at a minimum distance of 77 feet away at the 239 Butler Street hotel, across the street from the Head End Site, as well as additional ground level sidewalk and elevated receptors in the study area. Similar adjacent and elevated sidewalk receptors would be present at the Owls Head Site; therefore unitary concentrations would be similar or less than those predicted from the Head End Site.

ODORS

There is the potential for temporary odors during disturbance of MGP-contaminated or petroleum-contaminated soil at both the Head End and Owls Head Sites. To assess and mitigate odors to the greatest extent practicable, DEP would implement a Community Air Monitoring Program (CAMP) during these activities. As discussed in Chapter 10, “Hazardous Materials,” all necessary means would be employed to prevent on- and off-site odor nuisances. Odor control procedures may include: limiting the area of open excavations; shrouding excavations with tarps and other appropriate covers; and/or use of foams, sprays or misting systems. Appropriate regulatory agencies would be notified of any such odor issues.

PROBABLE IMPACTS OF THE PROJECT

CONSTRUCTION ACTIVITY ASSESSMENT

Maximum predicted concentrations during the representative worst-case construction phase (CP-2) at the Head End and Owls Head Sites are presented in **Tables 20-26 and 20-27**, respectively. To estimate the maximum total pollutant NO_2, CO, and PM_{10} concentrations, the modeled concentrations from the Project were added to a background value that accounts for existing pollutant concentrations from other nearby sources.

As shown in **Tables 20-26 and 20-27**, the maximum predicted total concentrations of NO_2, CO and PM_{10} are below the applicable NAAQS for both the Head End and Owls Head Sites. In addition, the maximum predicted $PM_{2.5}$ concentrations would not exceed the applicable CEQR *de minimis* thresholds in the 24-hour and annual averaging periods[17].

Emissions from the other less intensive construction phases, CP-1 and CP-3, would be less than the emissions during the CP-2 construction phase; therefore, the resulting concentrations from CP-1 and CP-3 are expected to be less than the concentrations presented for CP-2 below.

Table 20-26
Maximum Pollutant Concentrations from CP-2 Construction at the Head End Site

Pollutant	Averaging Period	Units	Maximum Modeled Impact	Background Concentration (1)	Total Concentration	Criterion
NO_2	Annual	μg/m³	2	33	35	100 (2)
CO	1-hour	μg/m³	216	2,176	2,392	40,000 (2)
	8-hour	μg/m³	63	1,603	1,666	10,000 (2)
PM_{10}	24-hour	μg/m³	6	44	50	150 (2)
$PM_{2.5}$	24-hour	μg/m³	2.4	21.3	N/A	6.85 (3)
	Annual—Local	μg/m³	0.14	8.7	N/A	0.3 (4)
	Annual—Neighborhood	μg/m³	0.01	8.7	N/A	0.1 (4)

Notes:
N/A—Not Applicable
1 The background levels are based on the most representative concentrations monitored at NYSDEC ambient air monitoring stations (see Table 15-3 in Chapter 15, “Air Quality”).
2 NAAQS.
3 $PM_{2.5}$ *de minimis* criterion—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m³.
4 $PM_{2.5}$ *de minimis* criterion—annual (local and neighborhood scale).

17 The CEQR 24-hour $PM_{2.5}$ *de minimis* criterion is equal to half the difference between the 24-hour background concentration (21.3 µg/m³) and the 24-hour standard (35 µg/m³).

Table 20-27
Maximum Pollutant Concentrations from CP-2 Construction at the Owls Head Site

Pollutant	Averaging Period	Units	Maximum Modeled Impact	Background Concentration (1)	Total Concentration	Criterion
NO_2	Annual	μg/m³	3	33	36	100 (2)
CO	1-hour	μg/m³	356	2,176	2,532	40,000 (2)
	8-hour	μg/m³	99	1,603	1,702	10,000 (2)
PM_{10}	24-hour	μg/m³	9	44	53	150 (2)
$PM_{2.5}$	24-hour	μg/m³	4.4	21.3	N/A	6.85 (3)
	Annual—Local	μg/m³	0.22	8.7	N/A	0.3 (4)
	Annual—Neighborhood	μg/m³	0.01	8.7	N/A	0.1 (4)

Notes:
N/A—Not Applicable
1 The background levels are based on the most representative concentrations monitored at NYSDEC ambient air monitoring stations (see Table 15-3 in Chapter 15, "Air Quality").
2 NAAQS.
3 $PM_{2.5}$ *de minimis* criterion—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m³.
4 $PM_{2.5}$ *de minimis* criterion—annual (local and neighborhood scale).

Combined Impact Assessment

The construction air quality analysis conservatively assumed that peak construction activities at both the Head End and Owls Head Sites would occur simultaneously. Maximum predicted concentrations from simultaneous CP-2 construction activities at both the Head End and Owls Head Sites are presented in **Table 20-28**. Emissions at both sites were modeled together to obtain total combined maximum concentrations from the Project. As shown in **Table 20-28**, the maximum predicted total combined concentrations of NO_2, CO, and PM_{10} are below the applicable NAAQS. In addition, the maximum predicted $PM_{2.5}$ concentrations would not exceed the applicable CEQR *de minimis* thresholds.

Table 20-28
Maximum Combined Pollutant Concentrations from CP-2 Construction at the Head End and Owls Head Sites

Pollutant	Averaging Period	Units	Maximum Modeled Impact	Background Concentration(1)	Total Concentration	Criterion
NO_2	Annual	μg/m³	3	33	36	100 (2)
CO	1-hour	μg/m³	356	2,176	2,532	40,000 (2)
	8-hour	μg/m³	99	1,603	1,702	10,000 (2)
PM_{10}	24-hour	μg/m³	9	44	53	150 (2)
$PM_{2.5}$	24-hour	μg/m³	4.4	21.3	N/A	6.85 (3)
	Annual—Local	μg/m³	0.23	8.7	N/A	0.3 (4)
	Annual—Neighborhood	μg/m³	0.01	8.7	N/A	0.1 (4)

Notes:
N/A—Not Applicable
1 The background levels are based on the most representative concentrations monitored at NYSDEC ambient air monitoring stations (see Table 15-3 in Chapter 15, "Air Quality").
2 NAAQS.
3 $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m³.
4 $PM_{2.5}$ *de minimis* criteria—annual (local and neighborhood scale).

Emissions from the other less intensive construction phases, CP-1 and CP-3, would be less than the emissions during the CP-2 construction phase; therefore, the resulting combined concentrations from CP-1 and CP-3 are expected to be less than the concentrations presented for CP-2 below.

GROUNDWATER TREATMENT SYSTEM SCREENING ANALYSIS

Table 20-29 presents the maximum modeled 1-hour and annual non-criteria pollutant concentrations from the groundwater treatment system at the Head End Site and compared the concentrations to the applicable SGCs and AGCs for each non-criteria pollutant.

Table 20-29
Maximum Non-Criteria Pollutant Concentrations from the Air Treatment System at the Head End Site (µg/m3)

Pollutant[1]	CAS No.	1-hour Concentration (µg/m^3)	SGC (µg/m^3)[2]	Percentage of SGC	Annual Concentration (µg/m^3)	AGC (µg/m^3)[2]	Percentage of AGC
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)							
Benzene[3]	**71-43-2**	**3.5280**	**1,300**	**< 1%**	**0.1050**	**0.13**	**81%**
Toluene	108-88-3	96.2185	37,000	< 1%	2.8636	5,000	< 1%
Ethylbenzene	100-41-4	561.2749	---	NA	16.7046	1000	2%
Xylene	1330-20-7	753.712	22,000	3%	22.4319	100	22%
Volatile Organic Compounds (VOCs)							
Carbon disulfide	75-15-0	0.0978	6,200	< 1%	0.0029	700	< 1%
Chlorobenzene	108-90-7	8.8200	---	NA	0.2625	60	< 1%
Chloroform	67-66-3	0.0994	150	< 1%	0.0030	14.7	< 1%
Cyclohexane	110-82-7	17.6401	---	NA	0.5250	6,000	< 1%
Dichlorodifluoromethane	75-71-8	0.0417	---	NA	0.0012	12,000	< 1%
1,2-Dichloroethane[3]	**107-06-2**	**0.6896**	**---**	**NA**	**0.0205**	**0.038**	**54%**
cis-1,2-Dichloroethene	156-59-2	78.5785	---	NA	2.3386	63	4%
2-Hexanone	591-78-6	6.4146	4,000	< 1%	0.1909	30	1%
Isopropyl benzene	98-82-8	481.0927	---	NA	14.3182	400	4%
Methyl acetate	79-20-9	0.2726	76,000	< %1	0.0081	1,400	< 1%
Methyl tert-butyl ether	1634-04-4	52.9202	---	NA	1.5750	3.8	41%
4-Methyl-2-pentanone	108-10-1	3.3676	31,000	< 1%	0.1002	3,000	< 1%
Methylcyclohexane	108-87-2	8.9804	---	NA	0.2673	3,800	< 1%
Methylene chloride	75-09-2	0.1283	14,000	< 1%	0.0038	60	< 1%
Tetrachloroethene (PCE)	127-18-4	0.0529	300	< 1%	0.0016	4	< 1%
Trichloroethene (TCE) [3]	**79-01-6**	**6.5429**	**20**	**33%**	**0.1947**	**0.2**	**97%**
Trichlorofluoromethane	75-69-4	1.3952	9,000	< 1%	0.0415	5,000	< 1%
1,2,3-Trimethylbenzene	526-73-8	0.0273	---	NA	0.0008	6	< 1%
1,2,4-Trimethylbenzene	95-63-6	0.0176	---	NA	0.0005	6	< 1%
Vinyl chloride[3]	**75-01-4**	**2.2130**	**180,000**	**< 1%**	**0.0659**	**0.068**	**97%**

Notes:
[1] *GEI Consultants Inc., July 2012 Final Remedial Investigation Report, Fulton Municipal Works Former Manufactured Gas Plant (MGP), Brooklyn, New York..*
[2] *DAR-1 AGC/SGC Tables,* NYSDEC Division of Air Resources, Bureau of Stationary Sources, July 2016.
[3] The results presented for 1,2-dichloroethane, benzene, vinyl chloride, and trichloroethene assumed an air stripper control efficiency of at least 99%, 98%, 77%, and 66%, respectively. These pollutants are highlighted in bold font. An air stripper is not required for the remaining pollutants; as such, a control efficiency of 0% was assumed for these pollutants.

The results of the groundwater treatment system screening analysis at the Head End Site demonstrates that there would be no predicted significant adverse air quality impacts from the groundwater treatment system during construction at the Head End Facility.

As discussed above, the level of soil contamination at the Owls Head Site is anticipated to be similar or less than that at the Head End Site; therefore the maximum 1-hour and annual concentrations from the groundwater treatment system at the Owls Head Site, if such a system is required, would be similar or less than the maximum concentrations predicted at the Head End Site. Since concentrations would not exceed the applicable SGCs and AGCs for each non-criteria pollutant at the Head End Site, it is expected that non-criteria pollutant concentrations would also not exceed the applicable SGCs and AGCs during construction at the Owls Head Site.

CONSTRUCTION AIR QUALITY ANALYSIS CONCLUSION

Construction at the Head End Site and the Owls Head Site would not result in any predicted concentrations above the NAAQS for NO_2, CO, and PM_{10} or the *de minimis* thresholds for $PM_{2.5}$ from nonroad and on-road sources. In addition, maximum predicted concentrations from the simultaneous construction at the Head End and Owls Head Sites would not result in combined concentrations above the applicable NAAQS or the *de minimis* thresholds. The predicted non-criteria pollutant concentrations from the groundwater treatment systems would not exceed the applicable SGCs and AGCs. Finally, to assess and mitigate odors to the greatest extent practicable, DEP would implement a CAMP during these activities and all necessary means would be employed to prevent on- and off-site odor nuisances. Therefore, no significant adverse air quality impacts are predicted from the construction of the Project.

E. CONSTRUCTION NOISE

INTRODUCTION

Construction equipment operation and construction vehicles traveling to and from the Project Sites can have a potential effect on community noise levels. Noise levels at a given location are dependent on the kind and number of pieces of construction equipment and vehicles 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 construction site, and any shielding effects from structures such as buildings, walls, or barriers. Noise levels caused by construction activities vary widely, depending on the phase of construction and the location of construction activities relative to receptor locations. Equipment such as excavators with vibratory hammers and construction vehicles such as dump trucks are expected to be the most dominant sources of construction noise.

Construction activities for the Project would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways. The effect of each of these noise sources was evaluated. The results presented show the effects of construction activities (i.e., noise due to both on-site construction equipment and construction-related vehicle operation).

METHODOLOGY

Sound Level Descriptors

Chapter 17, “Noise,” defines the sound level descriptors. The $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and construction noise impact evaluation, and is used to provide an indication of highest expected sound levels. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines. The maximum 1-hour equivalent sound level ($L_{eq(1)}$) was selected as the noise descriptor used in the construction noise impact evaluation.

Construction Noise Impact Criteria

The *CEQR Technical Manual* breaks construction duration into “short-term” (less than two years) and “long-term” (more than two years), and states that assessment of construction noise is not likely to result in an impact unless it “affects a sensitive receptor over a long period of time.” Consequently, in evaluating potential construction noise impacts, a construction noise analysis considers both the potential for construction of a project to create high noise levels (the “intensity”) and whether construction noise would occur for an extended period of time (the “duration”).

The *CEQR Technical Manual* provides the following criteria for evaluation of operational impacts, using the Future without the Project noise level as the baseline.[18]

- If the Future without the Project noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would be considered significant.
- If the Future without the Project noise level is between 60 dBA $L_{eq(1)}$ and 62 dBA $L_{eq(1)}$, a resultant $L_{eq(1)}$ of 65 dBA or greater would be considered a significant increase.
- If the Future without the Project noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the *CEQR* criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$.

These levels serve as the initial screening criteria for potential construction noise impacts. At locations where construction of the Project would exceed these criteria, the duration and magnitude of exceedances is considered to determine the potential for significant adverse impacts.

Noise Analysis Methodology

Noise at a specific receptor location near a construction site from the operation of construction equipment on the site is calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. For each piece of on-site construction equipment, the noise level at a receptor site is a function of:

- The noise emission level of the equipment;
- A usage factor, which accounts for the percentage of time the equipment is operating;[19]
- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

Similarly, noise levels due to construction-related traffic are a function of:

- The noise emission levels of the type of vehicle (e.g., automobile, light-duty truck, heavy-duty truck, bus, etc.);
- Number of vehicles on the roadway;
- Vehicular speed;

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[18] These impact criteria are specified in section 410 of the *CEQR Technical Manual* Chapter 19, “Noise,” for evaluation of operational-period mobile sources.

[19] Usage factors for each piece of equipment will be based on values shown in Section 28-109 of DEP’s “Rules for Citywide Construction Noise Mitigation” document (2007).

- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

Analysis Periods

The noise analysis presented in this section is based on the preferred Project construction schedule, with construction activities typically occurring in one 10-hour shift from 7 AM to 5 PM, five days a week on weekdays. A separate detailed construction noise analysis for an Alternative Construction Schedule Scenario that assumes additional construction activity on the weekends is presented in Section O, "Alternative Construction Schedule Scenario," below.

Reasonable worst-case noise analysis periods were established for the detailed (quantitative) noise analysis. These are the periods of construction that were expected to have the greatest potential to result in construction noise impacts ~~(i.e., construction activities during CP-2)~~. The DEIS considered CP-2 to have the peak construction periods (three periods were selected for detailed analysis). Following publication of the DEIS to reflect updated design, additional detailed analysis was performed for the CP-1 and CP-3 construction periods, resulting in a total of five reasonable worst-case noise analysis periods.

~~Based on the construction schedule, three five representative construction analysis periods were selected for detailed noise analysis.~~ The first selected analysis period is the SOE stage of CP-2 construction, which includes SOE construction, and is anticipated to have a duration of approximately 13 months. The second selected analysis period is the excavation stage of CP-2 construction, which is anticipated to have a duration of approximately 10 months. The third selected analysis period is the construction of the below-grade structures during CP-2, which is anticipated to have a duration of approximately 24 months. The fourth selected analysis period is the buildings/site demolition during CP-1, which is anticipated to have a duration of approximately 6 months. The fifth selected analysis period is the overlap of equipment installation, sitework and conveyance construction during CP-3, which is anticipated to have a duration of approximately 2 months. The ~~three~~ five analysis periods selected would occur ~~during CP-2 construction (SOE, site excavation, and below-grade structures)~~where a large number of noise-intensive equipment (i.e., concrete trucks, concrete pumps, cranes, clamshell excavators, dozers, loaders) would be employed simultaneously at the Head End Site and the Owls Head Site. The construction noise analysis conservatively assumes that peak construction activities at both sites would occur simultaneously. **Table 20-30** shows the construction ~~analysis~~ periods. Only the one-month first stage of CP-2, removal of buildings' foundations and below-grade elements, was not analyzed in detail; rather, it was conservatively represented by the SOE stage of CP-2 construction, during which more equipment would operate at the construction work areas and more trucks would travel to and from the work areas.

~~The CP-1 construction phase (site preparation, utility relocation and abatement, and demolition) is expected to occur for up to approximately 9 months. The noise produced by the loudest equipment used during CP-1 (~~i.e., ~~hoe-ram attachments, jack hammers, and dump-trucks during site prep and demolition activities) would be less than the noise intensive stationary sources (i.e., concrete trucks, concrete pumps, cranes, clamshell excavators, dozers, loaders) that contribute to elevated noise levels under CP-2 construction. In addition, approximately 10 percent of the total volume of material required to be transported to and delivered from the site during CP-2 construction, mainly in the form of demolition debris, would be transported offsite during CP-1 construction; therefore, noise produced by truck traffic during CP-1 construction is expected to be less than the noise produced by truck traffic during CP-2 construction and overall noise levels during CP-1 construction would be lower than those predicted to occur during CP-2 construction.~~

~~Likewise, the CP-3 construction phase (above-grade structures construction, conveyance construction, outfalls construction, and landscaping) is expected to occur for up to approximately 24 months. The noise produced by the loudest equipment used during CP-3 construction (~~i.e., ~~cranes and forklifts operating during above-ground construction and excavators, backhoes and pavement cutters operating during construction of the new conveyance system) would be less than the noise intensive stationary sources (i.e., concrete trucks, concrete pumps, cranes, clamshell excavators, dozers, loaders) that contribute to elevated noise levels under CP-2 construction. In addition, approximately 25 percent of the total volume of material required to be transported to and delivered from the site during CP-2 construction, mainly in the form of delivery materials, would be delivered to the site during CP-3 construction; therefore, noise produced by truck traffic during CP-3 construction is expected to be less than the noise produced by truck traffic during CP-2 construction and overall noise levels during CP-3 construction would be lower than those predicted to occur during CP-2 construction.~~

~~Construction activities during CP-1 and CP-3 would include less noise-intensive construction equipment and activity and would require less construction traffic than construction activities during CP-2 construction. Therefore, the potential for noise impacts during these periods are discussed qualitatively.~~

Table 20-30
Construction Analysis Periods

Phase	Stage	Construction Activities	Approximate Duration
CP-1	Site Preparation, Utility Relocation, and Demolition	Site preparation, utility relocation and abatement, and demolition	12 Months
CP-2	Stage I: Slabs and Below-Grade Elements Removal	Removal of existing buildings' concrete foundations slabs and below-grade elements	1 Month
	Stage II: SOE	Excavation for SOE and concrete pour to form permanent SOE wall	13 Months
	Stage III: Site Excavation	Site excavation and groundwater treatment	10 Months
	Stage IV: Below-Grade Structures	Below-grade structures construction	24 Months
CP-3	Above-Grade Structures, Conveyances, and Outfalls	Above-grade structures construction, conveyance construction, outfalls construction, and landscaping	24 Months

Construction Noise Modeling

Potential noise impacts from construction activities were evaluated using the CadnaA model, computerized noise prediction software developed by DataKustik for noise prediction and assessment. The CadnaA model is a state-of-the-art tool for noise analysis and is approved for construction noise level prediction by the *CEQR Technical Manual*. The model can be used for the analysis of a wide variety of noise sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment), transportation sources (e.g., roads, highways, railroad lines, busways, airports), and other specialized sources (e.g., sporting facilities). CadnaA takes into account the reference sound pressure levels of the noise sources at 50 feet, attenuation with distance, ground contours, reflections from barriers and structures, attenuation due to shielding, etc. The CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2.[20]

Geographic input data used with the CadnaA model included CAD drawings that defined likely site work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the geographic location and operational characteristics—including equipment usage rates (percentage of time operating at full power) for each piece of construction equipment

[20] This standard is currently under review for adoption by the American National Standards Institute (ANSI) as an American Standard.

operating at the Project Sites, as well as noise control measures—were input to the model. Construction-related vehicles assigned to the adjacent roadways were also input to the model. In addition, reflections and shielding from adjacent buildings were accounted for in the model. The model produced A-weighted $L_{eq(1)}$ noise levels at each receptor location for each analysis period, as well as the contribution from each noise source.

Noise Reduction Measures

Construction associated with the Project would follow the requirements of the *NYC Noise Control Code* (also known as Chapter 24 of the Administrative Code of the City of New York, or Local Law 113) for construction noise control measures. Therefore, the measures described below are incorporated into the Project for purposes of the noise analysis. These measures include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the *NYC Noise Code*:

- All equipment utilized for the project will meet the sound level standards specified in Subchapter 5 of the *NYC Noise Control Code* from the start of construction. **Table 20-31** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the Project. For equipment other than those listed in **Table 20-31**, noise emission values for analysis would be determined based on manufacturer's specifications, published noise level data, or field measurements.
- All construction equipment would be required to use all available manufacturers' noise reduction devices.
- As early in the construction period as logistics will allow, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practicable.
- Where feasible and practicable, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to idle more than three minutes at the construction site per Title 24, Chapter 1, Subchapter 7, Section 24-163 of the *NYC Administrative Code*.
- Contractors and subcontractors would be required to properly maintain their equipment, mufflers, and other installed noise reduction equipment.

Table 20-31
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	DEP L_{max} Noise Level at 50 feet[1]
Backhoe	80
Compressor (air, less than or equal to 350 cfm)	80
Clamshell Excavator	93
Concrete Mixer Truck	85
Concrete Pump Truck	82
Concrete Saw	90
Crane	85
Dozer	85
Dump Truck	84
Excavator	85
Front End Loader	80
Jackhammer	89
Slurry Mixer	78
Tractor	84
Bar Bender	80
Pump	77
Vacuum Excavator (Vac-truck)	85

Sources: [1] "Rules for Citywide Construction Noise Mitigation," Chapter 28, DEP, 2007.

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction would be implemented to the extent feasible and practicable:

- Where logistics allow, noise-intensive equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations.
- Noise barriers would be constructed from plywood or other materials to provide shielding.
- Temporary 8-foot quilted fiberglass noise barriers would be installed to reduce noise from in-street sewer work.

Path noise control measures would be implemented (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) for certain dominant pieces of equipment to the extent feasible and practical if required, based on the results of the construction noise calculations. The details regarding the construction of portable noise barriers, enclosures, tents, etc., are found in DEP's "Rules for Citywide Construction Noise Mitigation."[21]

EXISTING NOISE LEVELS

Selection of Noise Receptor Locations

A total of 11 receptor locations were used to evaluate community noise impacts from simultaneous construction activities at the Head End Site and the Owls Head Site. These locations are detailed below in **Table 20-32** and shown in **Figure 20-19.**

Table 20-32
Noise Measurement Locations

Noise Receptor	Location	Land Use(s) Represented	Type of Measurements
Spot (60-minutes) Noise Monitoring			
1	Butler Street between Nevins Street and Bond Street	Residential	60-minute spot measurement
2	Northeast corner of Nevins Street and Butler Street	Residential	60-minute spot measurement
3	Southwest corner of 3rd Avenue and Union Street	Residential	60-minute spot measurement
4	Degraw Street between 3rd Avenue and 4th Avenue	Residential/Hotel	60-minute spot measurement
5	Nevins Street between Sackett Street and Union Street	Residential	60-minute spot measurement
6	Northeast Corner of Douglass Street and Bond Street	Residential	60-minute spot measurement
7	Gowanus Waterfront Park at 2nd street and the Gowanus Canal West Bank.	Open Space/ Recreation/ Residential	60-minute spot measurement
8	Southeast Corner of 2nd Avenue and 9th Street	Residential	60-minute spot measurement
9	4th Street between Bond Street and Hoyt Street	Residential	60-minute spot measurement
35P	Degraw Street between Nevins Street and 3rd Avenue	Open Space/ Recreation/Pool	60-minute spot measurement
Continuous 24-Hour Noise Monitoring			
10	Nevins Street between Douglass Street and Degraw Street	Open Space/ Recreation	24-hour continuous measurement
11	Southwest corner of Whole Foods Market Outdoor Space	Open Space/ Recreation	24-hour continuous measurement

The receptor locations were selected to provide comprehensive geographic coverage of the ambient noise environment within the area of potential construction noise impacts.

[21] As found at http://www.nyc.gov/html/dep/pdf/noise_constr_rule.pdf

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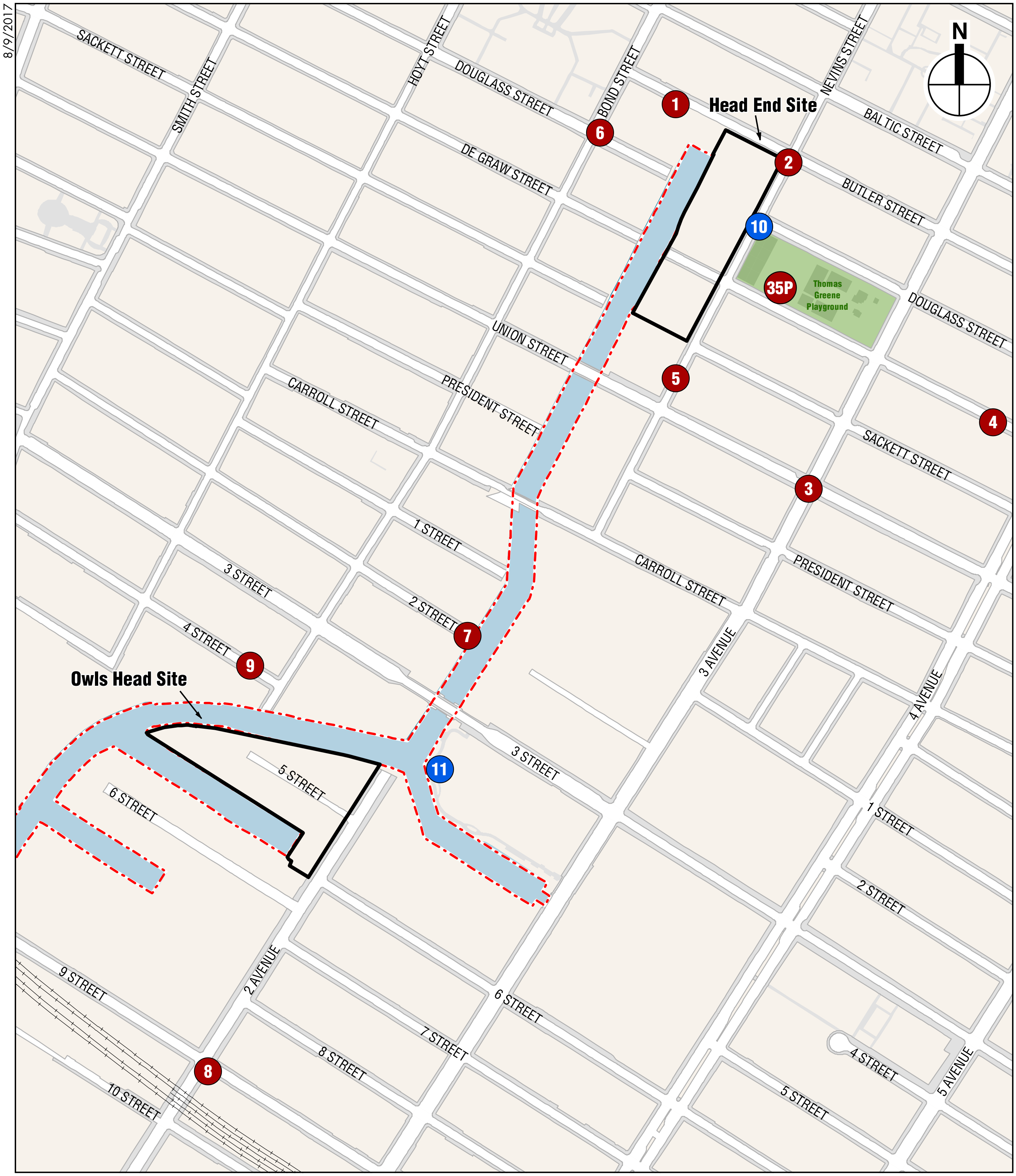

Project Sites

60-minute spot measurements

24-hour continuous measurements

Gowanus Canal

Gowanus Canal CSO Facilities

Noise Measurement Locations

Figure 20-19

Noise Monitoring Results

Continuous 24-hour noise measurements were performed at sites 10 and 11 on October 5, 2016 to October 6, 2016. Concurrently, spot noise level measurements were conducted for 60-minutes at sites 1, 3, 4, 5, 6, 7, 8, and 9. Existing noise levels were measured at site 2 for 60-minutes on October 19, 2016. Existing noise levels were measured at site 35P for 60-minutes on August 4, 2017. Measurements were conducted on weekdays between Tuesday and Thursday on weeks when New York City Public Schools were in session as recommended by the *CEQR Technical Manual*. The measurement at site 35P was conducted during the summer at the perimeter of the Douglass and Degraw Pool to document typical existing condition noise levels while the pool is in use. A description of the noise monitoring equipment used for the analysis is discussed in Chapter 17, “Noise”.

Existing Noise Levels at Noise Measurement Locations

The measured existing $L_{eq(1)}$ and $L_{10(1)}$ noise levels at each measurement location are summarized in **Tables 20-33**. At Sites 1 through 6, the 24-hour existing noise levels were calculated by prorating spot-measured noise levels based on the temporal distribution of measured noise levels at Site 10. At Sites 7 through 9 24-hour existing noise levels were calculated by prorating spot-measured noise levels based on the temporal distribution of measured noise levels at Site 11. Specifically, for each spot measurement location, the difference in measured L_{eq} values at the spot measurement location versus the continuous measurement location at the same hour was applied to noise levels measured at the continuous measurement location for each hour to develop a 24-hour profile of noise levels. The minimum measured noise levels occurred during the 2 AM hour at Sites 10 and 11. Full measurement results are provided in **Appendix 20-2**.

At receptor 35P, a single spot-measured noise level was sufficient to represent existing noise levels while the pool was in use. During times when the pool is not in use this location would not be considered a receptor.

At receptor sites 1 through 11, vehicle traffic on adjacent or nearby roadways was the dominant noise source. Measured levels at all sites were moderate and reflected the levels expected from vehicular traffic on adjacent roadways. Rail noise from the New York City Transit (NYCT) F and G elevated subway rail lines also contributed to measured noise levels at Sites 8 and 9. Users of the Douglass and Degraw Pool were the dominant noise source at receptor site 35P. In terms of the CEQR criteria as defined in Table 17-2 in Chapter 17 “Noise,” the minimum existing noise levels at Receptors 1, 5 and 7 are in the “acceptable” category for residences and hotels, the minimum existing noise levels at Receptors 2, 3, 4, 6, 8, and 9 are in the “marginally acceptable” category for residences and hotels.

Minimum existing noise levels at Receptors 10 and 35P are above the “acceptable” noise exposure guideline criteria for open spaces requiring serenity and quiet, while the minimum existing noise levels at Receptor 11 are within the “acceptable” noise exposure guideline criteria for open spaces requiring serenity and quiet.

Table 20-33
Existing Noise Levels in dBA

Receptor Site	Location	Measurement Start Time	Measured Noise Levels in dBA[1]		Minimum Existing Noise level in dBA (during construction hours 7:00 AM to 5:00 PM)[3]	
			L_{eq}	L_{10}	L_{eq}	L_{10}
1	Butler Street between Nevins Street and Bond Street	6:00 PM	60.4	62.9	57.0	60.7
2	Northeast corner of Nevins Street and Butler Street	7:00 PM	66.7	63.7	67.1	63.9
3	Southwest corner of 3rd Avenue and Union Street	4:00 PM	72.3	74.6	69.4	72.9
4	Degraw Street between 3rd Avenue and 4th Avenue	3:00 PM	65.9	67.2	62.0	63.5
5	Nevins Street between Sackett Street and Union Street	11:00 AM	62.7	63.0	60.1	60.2
6	Northeast Corner of Douglass Street and Bond Street	5:00 PM	74.6	64.8	71.7	63.1
7	Gowanus Waterfront Park at 2nd street and the Gowanus Canal West Bank.	2:00 PM	57.3	59.3	50.2	52.3
8	Southeast Corner of 2nd Avenue and 9th Street	4:00 PM	75.6	78.5	73.8	76.7
9	4th Street between Bond Street and Hoyt Street	4:00 PM	65.8	67.6	61.5	62.0
10	Nevins Street between Douglass Street and Degraw Street	Each hour[5]	61.2 to 65.6	54.2 to 67.4	61.2[4]	63.4
11	Southwest corner of Whole Food Market Outdoor Space	Each hour[5]	50.6 to 65.0	52.8 to 67.2	55.0[4]	57.2
35P[2]	Degraw Street between Nevins Street and 3rd Avenue	1:30 PM	66.1	68.6	-	-

Notes:
[1] Noise Level measurements at locations 1 through 11 were conducted by AKRF, Inc. on October 5, 2016 (Wednesday), October 6, 2016 (Thursday), and October 19, 2016 (Wednesday), and are representative of weekday conditions.
[2] The Noise level measurement at location 35P was conducted by AKRF, Inc. on August 4, 2017 (Friday) and is representative of typical summer pool-side conditions.
[3] Minimum $L_{eq(1)}$ and $L_{10(1)}$ noise levels are based on prorating measured $L_{eq(1)}$ and $L_{10(1)}$ based on 24-hour noise level profile at representative 24-hour continuous noise measurement locations.
[4] Minimum measured or prorated $L_{eq(1)}$ and $L_{10(1)}$ noise levels (during construction hours) are presented. Using the minimum measured noise levels as a basis of comparison is conservative since minimum baseline noise levels would tend to result in maximum projected noise level increments resulting from construction. Full 24-hour measurement results are presented in Appendix 20-2.
[5] Noise levels at receptor sites 10 and 11 were measured every hour for 24-hours. Full 24-hour measurement results for receptor sites 10 and 11 are presented in Appendix 20-2.

PROBABLE IMPACTS OF THE PROJECT

Noise Analysis Receptor Sites

In addition to the twelve noise measurement locations (i.e., sites 1 to 11 and 35P), 51 additional noise analysis receptors (see **Figures 20-20 and 20-21**) were selected to represent existing and future potential residential buildings, hotels, and public open spaces where maximum Project effects due to construction noise would be expected. These receptors were located in proximity to the Project work areas and along routes that construction trucks would use traveling to and from the Project work areas. Multiple building façades and elevations were selected. **Table 20-34** lists the noise receptor sites and the associated land use at each site.

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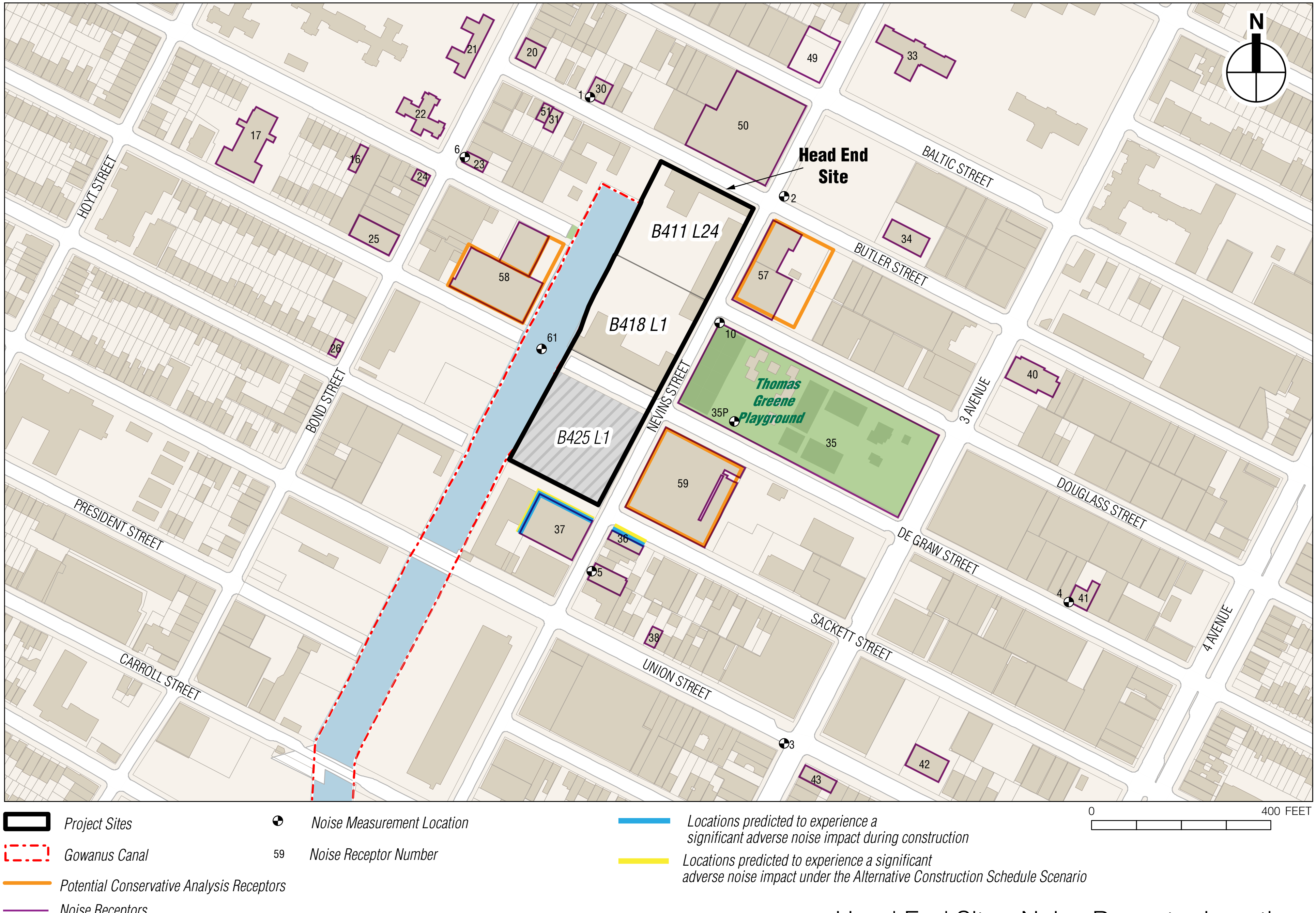
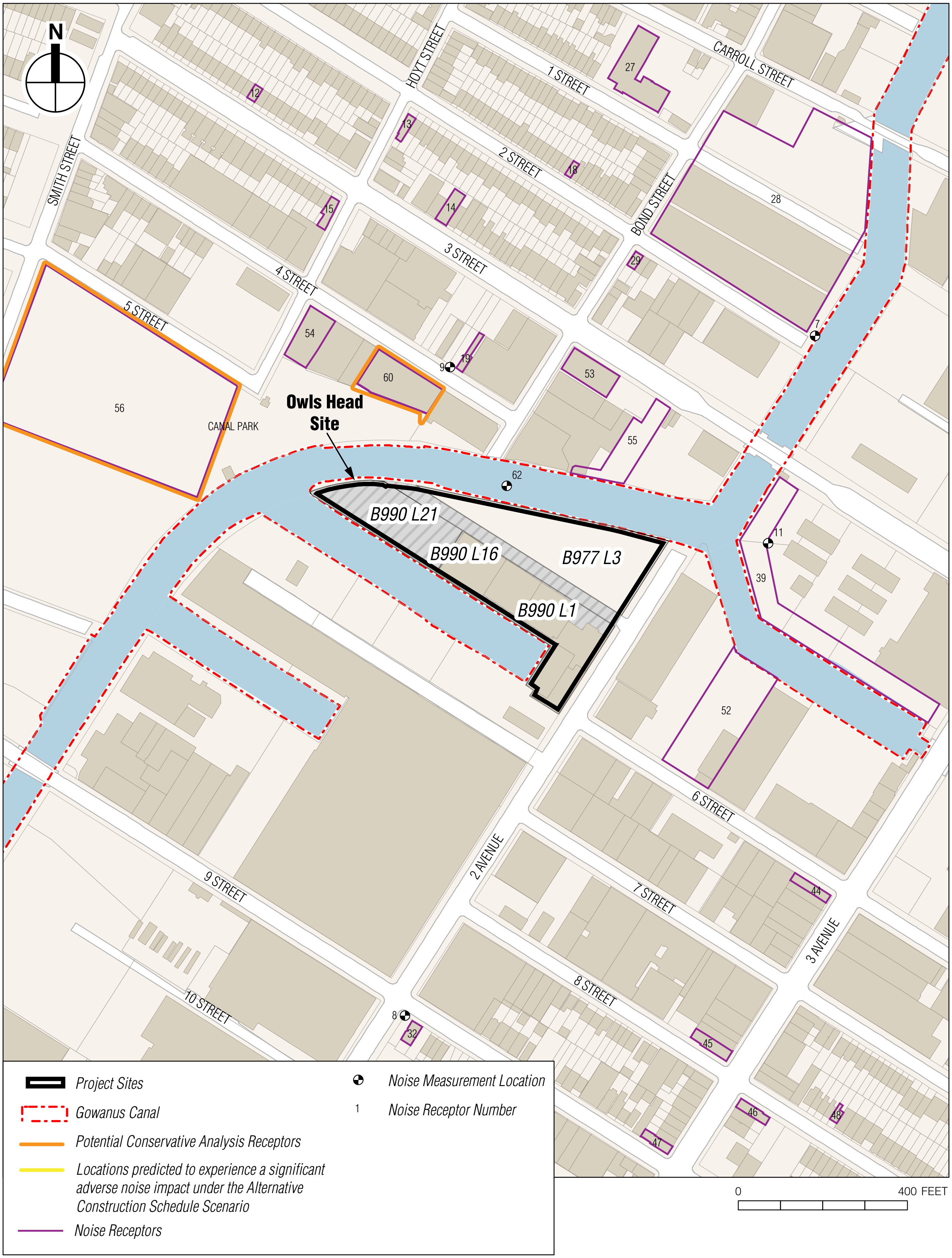


Gowanus Canal CSO Facilities

Head End Site - Noise Receptor Locations

Figure 20-20



Owls Head Site - Noise Receptor Locations

Figure 20-21

Table 20-34
Noise Receptor Sites

Receptor	Location (Block)	Lot	Associated Land Use
1	n/a	n/a	Measurement Location
2	n/a	n/a	Measurement Location
3	n/a	n/a	Measurement Location
4	n/a	n/a	Measurement Location
5	n/a	n/a	Measurement Location
6	n/a	n/a	Measurement Location
7	n/a	n/a	Measurement Location
8	n/a	n/a	Measurement Location
9	n/a	n/a	Measurement Location
10	n/a	n/a	Measurement Location
11	n/a	n/a	Measurement Location
12	460	47	Residential
13	461	8	Residential
14	461	59	Residential
15	464	39	Residential
16	416	32	Residential
17	416	17	Residential
18	457	50	Residential
19	465	46	Residential
20	405	1	Residential
21	404	1	Residential
22	404	1	Residential
23	411	1	Residential
24	416	39	Residential
25	416	7501	Residential
26	423	41	Residential
27	451	25	Residential
28	458	1	Residential
29	462	3	Residential
30	405	58	Residential
31	411	13	Residential
32	1008	8	Residential
33	394	1	Residential
34	406	67	Residential
35	419	1	Open Space
35P	419	1	Pool
36	433	10	Residential
37	432	25	Residential
38	433	53	Residential
39	978	30	Open Space
40	413	7	Residential
41	420	52	Residential
42	434	16	Residential
43	441	7	Residential
44	991	37	Residential
45	996	40	Residential
46	1003	8	Residential
47	1002	37	Residential
48	997	70	Residential
49	399	45	Commercial (Hotel)
50	405	27	Commercial (Hotel)
51	411	10	Commercial
52	979	18	Commercial
53	466	1	Commercial

Table 20-34, cont'd
Noise Receptor Sites

Receptor	Location (Block)	Lot	Associated Land Use
54	471	104	Commercial
55	466	17	Commercial
56	471	1/100	Residential and Open Space (conservatively assumed) [1]
57	412	1	Residential (conservatively assumed)[1]
58	417	21	Residential (conservatively assumed)[1]
59	426	1	Residential (conservatively assumed)[1]
60	471	116	Residential (conservatively assumed)[1]
61	n/a	n/a	Gowanus Canal Near Head End Site
62	n/a	n/a	Gowanus Canal Near Owls Head Site

Note:
[1] Conservative analysis receptors were also placed at key locations identified as potential future residential development sites to conservatively evaluate the Project's effect on potential future land use changes; specifically, receptors 56, 57, 58, 59, and 60.

Construction Noise Analysis Results

Noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during the worst-case noise analysis periods from on-site construction equipment and construction-related vehicles.

Table 20-35 summarizes the minimum and maximum predicted weekday construction noise impacts at each receptor site as a result of construction~~ during the entire 48-month CP-2 construction phase~~. Full construction noise analysis results for each of the worst-case analysis periods are provided in **Appendix 20-2**.

Construction of the Project is predicted to result in noise level increases at residences near both project sites during some portions of the CP-2 construction phase. Generally, the noise level increases resulting from construction would occur at buildings in the immediate vicinity of construction activity.

As noted above, at the Head End Site, the demolition of the buildings at 234 Butler Street that include the two-story former Gowanus Station and associated one-story extensions on Butler and Nevins Streets as well as the buildings at 242-244 Nevins Street and 270 Nevins Street would constitute a significant adverse impact to architectural resources. Therefore, consultation with SHPO and LPC is being undertaken to explore measures to avoid, minimize, and mitigate the demolition of these buildings, including preparation of a feasibility study that would evaluate the potential of retaining the buildings in a manner that would allow the Project to meet its goals and objectives. ~~This evaluation may result in shifts in the construction schedule, updates in the construction logistics, and potentially additional construction noise impacts to nearby sensitive receptor locations.~~Following publication of the DEIS, additional analysis was undertaken for the CP-1 construction period (site preparation, utility relocation and abatement, and demolition), that reflects a conservative reasonable worst-case scenario.

The maximum predicted noise levels shown in **Table 20-35** would occur during the most noise-intensive activities of construction such as SOE and site excavation during CP-2 and conveyance work during CP-3, which would not occur every day during the construction period, and do not occur during every hour on days when those activities are underway. During hours when the loudest pieces of construction equipment are not in use, receptors would experience lower construction noise levels. As described below, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction.

Table 20-35
Construction Noise Analysis Results in dBA

Receptor Site	Existing L_{eq} in dBA		Total L_{eq} in dBA						Change in L_{eq} in dBA[1]					
			CP1		CP2		CP3		CP1		CP2		CP3	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	57.0	57.0	57.1	57.1	57.2	57.3	58.2	58.2	0.1	0.1	0.2	0.3	1.2	1.2
2	67.1	67.1	68.5	68.5	68.8	71.3	71.5	71.5	1.4	1.4	1.7	4.2	4.4	4.4
3	69.4	69.4	69.5	69.5	69.6	70.0	69.8	69.8	0.1	0.1	0.2	0.7	0.4	0.4
4	62.0	62.0	62.0	62.0	62.0	62.1	62.1	62.1	0.0	0.0	0.0	0.1	0.1	0.1
5	60.1	60.1	63.0	63.0	63.6	68.4	65.8	65.8	2.9	2.9	3.5	8.3	5.7	5.7
6	71.7	71.7	71.7	71.7	71.7	71.8	71.7	71.7	0.0	0.0	0.0	0.1	0.0	0.0
7	52.0	52.0	52.7	52.7	53.0	54.6	53.2	53.2	0.7	0.7	1.0	2.6	1.2	1.2
8	73.8	73.8	73.9	73.9	74.0	74.4	74.1	74.1	0.1	0.1	0.2	0.6	0.3	0.3
9	61.5	61.5	61.5	61.5	61.5	61.6	61.5	61.5	0.0	0.0	0.0	0.1	0.0	0.0
10	61.2	61.2	64.9	64.9	65.0	69.8	68.1	68.1	3.7	3.7	3.8	8.6	6.9	6.9
11	55.0	55.0	56.1	56.1	55.8	59.4	55.8	55.8	1.1	1.1	0.8	4.4	0.8	0.8
12	52.0	54.2	52.0	54.4	52.0	55.0	52.1	54.5	0.0	0.2	0.0	0.8	0.1	0.3
13	52.0	54.4	52.1	54.4	52.0	54.5	52.1	54.4	0.0	0.3	0.0	0.9	0.0	0.5
14	52.0	54.9	52.1	54.9	52.0	55.2	52.1	55.0	0.0	0.2	0.0	0.9	0.1	0.3
15	53.6	55.2	54.6	55.4	54.5	57.1	54.6	55.6	0.0	1.7	0.0	3.5	0.0	1.9
16	52.0	57.9	52.1	58.1	52.1	59.0	52.1	58.2	0.0	0.4	0.0	1.1	0.0	0.5
17	52.0	62.5	52.0	62.6	52.0	63.0	52.1	62.6	0.0	1.7	0.0	4.8	0.1	2.3
18	52.0	52.0	52.1	52.1	52.0	52.3	52.1	52.1	0.1	0.1	0.0	0.3	0.1	0.1
19	52.0	55.9	52.1	56.0	52.0	56.1	52.1	56.0	0.1	0.1	0.0	0.4	0.1	0.2
20	52.0	55.0	52.3	56.0	52.5	56.4	52.5	56.7	0.0	2.4	0.0	3.9	0.1	2.2
21	52.0	53.2	52.1	55.3	52.1	57.2	52.1	56.3	0.1	2.6	0.1	5.2	0.1	3.4
22	52.0	63.1	52.1	63.2	52.1	64.8	52.1	63.4	0.0	0.9	0.0	3.2	0.0	1.2
23	62.1	66.8	62.3	66.8	62.2	67.4	62.3	66.9	0.0	0.7	0.0	2.0	0.0	1.0
24	62.5	66.1	62.5	66.1	62.6	66.3	62.6	66.1	0.0	0.1	0.0	1.3	0.0	0.2
25	63.6	65.2	63.7	65.2	63.6	65.6	63.7	65.3	0.0	0.2	0.0	0.9	0.0	0.3
26	57.3	63.4	57.4	63.8	57.4	64.4	57.5	63.8	0.0	1.0	0.0	1.9	0.0	1.1
27	52.0	52.0	52.0	53.5	52.0	55.9	52.1	54.7	0.0	1.5	0.0	3.9	0.1	2.7
28	52.0	52.3	52.0	54.1	52.0	58.7	52.1	54.8	0.0	2.1	0.0	6.7	0.1	2.8
29	52.0	52.0	52.1	52.2	52.0	52.9	52.1	52.4	0.1	0.2	0.0	0.9	0.1	0.4
30	52.0	54.7	52.1	58.8	52.2	63.3	52.4	60.8	0.1	4.9	0.2	9.4	0.4	6.9
31	52.0	54.0	52.4	56.4	52.2	60.9	52.5	57.1	0.1	4.4	0.2	8.9	0.5	3.8
32	56.5	69.7	56.7	69.8	56.7	70.2	57.0	70.0	0.1	0.2	0.2	0.7	0.3	0.5
33	52.0	56.5	52.1	57.6	52.1	62.5	52.2	60.1	0.1	3.3	0.1	9.3	0.2	5.5
34	52.0	58.5	52.2	60.0	52.3	63.1	52.6	61.6	0.2	2.3	0.3	5.8	0.6	4.0
35	56.2	66.1	56.7	66.3	57.5	68.9	57.4	68.9	0.2	5.2	0.2	10.4	0.4	10.4
35P	66.1	66.1	66.3	66.3	66.4	67.2	66.9	66.9	0.2	0.2	0.2	1.1	0.8	0.8
36	52.0	55.2	59.2	63.4	56.6	71.2	60.0	65.3	6.2	9.3	4.2	17.4	8.0	10.4
37	52.0	55.0	52.4	66.3	52.2	71.8	52.7	65.8	0.4	14.3	0.2	19.8	0.7	13.8
38	52.0	59.0	52.2	59.0	52.1	59.3	52.3	59.1	0.0	3.8	0.1	6.4	0.1	4.2
39	53.4	56.5	54.0	57.6	54.2	61.7	54.2	57.2	0.6	1.1	0.7	5.2	0.7	0.8
40	52.0	65.7	52.1	65.9	52.2	66.7	52.4	66.3	0.1	0.9	0.2	3.4	0.4	1.7
41	52.0	58.8	52.0	58.4	52.0	58.6	52.1	58.5	0.0	0.1	0.0	0.4	0.1	0.2
42	52.0	58.2	52.5	60.3	52.8	60.6	53.3	60.4	0.0	2.3	0.0	5.5	0.1	3.7
43	60.2	64.3	60.3	64.5	60.3	65.5	60.4	65.0	0.1	0.4	0.1	1.4	0.3	0.8
44	56.5	65.7	56.7	65.8	56.8	66.5	57.3	66.2	0.2	0.4	0.3	1.7	0.5	1.2
45	53.6	71.8	53.6	71.8	53.6	71.8	53.9	71.8	0.0	0.5	0.0	1.2	0.0	0.9
46	56.9	71.9	56.9	71.9	56.9	72.1	57.0	72.0	0.0	0.0	0.0	0.2	0.1	0.1
47	58.5	72.4	69.9	72.5	69.9	72.7	70.0	72.6	0.1	0.1	0.1	0.4	0.2	0.3

Table 20-35 (cont'd)
Construction Noise Analysis Results in dBA

Receptor Site	Existing L_{eq} in dBA		Total L_{eq} in dBA						Change in L_{eq} in dBA					
			CP1		CP2		CP3		CP1		CP2		CP3	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
48	52.0	70.9	52.1	61.2	52.0	61.2	52.2	61.2	0.0	0.6	0.0	1.5	0.0	0.9
49	52.0	59.3	52.1	60.4	52.1	63.1	52.3	62.2	0.1	1.1	0.1	3.8	0.3	3.4
50	52.0	60.2	52.5	66.3	52.6	72.1	53.7	73.3	0.1	7.4	0.1	14.0	0.3	14.6
51	52.0	54.2	53.9	54.4	54.0	54.6	55.7	56.9	0.1	0.2	0.2	0.6	1.6	3.0
52	52.0	57.5	52.6	58.8	52.4	61.2	52.7	60.6	0.6	4.8	0.1	9.2	0.7	7.5
53	52.0	57.2	53.8	58.3	54.8	57.8	54.2	57.7	0.1	1.8	0.0	5.2	0.1	2.2
54	52.0	58.8	55.8	58.8	55.8	58.9	55.8	58.8	0.0	0.1	0.0	0.2	0.0	0.1
55	52.0	65.6	53.1	65.6	52.2	67.6	52.5	65.6	0.0	10.4	0.0	15.6	0.0	5.5
56	52.0	52.0	52.9	55.0	52.7	61.5	53.1	55.7	0.9	3.0	0.7	9.5	1.1	3.7
57	52.0	59.6	54.5	66.4	54.6	73.3	55.2	73.1	0.3	10.2	0.4	17.4	1.0	17.2
58	52.0	67.6	53.5	67.7	53.6	70.6	53.7	67.8	0.1	11.9	0.0	18.6	0.2	12.0
59	52.0	66.2	52.5	67.8	52.6	76.2	53.5	75.6	0.5	7.7	0.6	16.1	1.5	15.5
60	52.0	55.6	55.0	59.6	54.6	65.1	55.0	57.9	0.1	7.6	0.0	13.1	0.1	5.9
61	56.3	56.3	61.0	61.0	59.3	64.9	60.4	60.4	4.7	4.7	3.0	8.6	4.1	4.1
62	52.0	52.0	58.7	58.7	55.2	61.9	53.8	53.8	6.7	6.7	3.2	9.9	1.8	1.8

Notes: * This table has been updated for the FEIS.

For receptors representing buildings, the change in L_{eq} was calculated by subtracting the existing L_{eq} from the total L_{eq} during each construction period individually at each floor of each façade; the minimum and maximum for each receptor and each period are the values shown above.

Receptor 36—Residential Receptor on Nevins Street across from the Head End Site Staging Area
At the existing residential receptor located at 285 Nevins Street across from the Head End Site staging area—Receptor 36—existing weekday noise levels are in the low 50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low~~ mid 50s to low 70s dBA, resulting in noise level increases of up to approximately 17 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of dump trucks and excavators operating during the site excavation portion of CP-2 construction at the Head End Site, with a duration of approximately 10 months. The predicted noise level increases at this residence would be noticeable and potentially intrusive and the total noise levels would be in the "marginally unacceptable" range based on *CEQR Technical Manual* noise exposure criteria. Noise levels during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) would range from the low 50s to the low 60s dBA, resulting in noise level increases of up to approximately 7 dBA. Based on the high magnitude and the duration of these noise level increases, construction of the Project would have the potential to result in a temporary significant adverse impact at the existing residential receptor at 285 Nevins Street located across Nevins Street from the Head End Site staging area (i.e., Receptor 36). Standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be in the ~~high~~ mid 40s dBA, up to approximately ~~4~~1 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor at 285 Nevins Street across from the Head End Site staging area that would be comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above,~~ Stationary equipment and truck ~~volumes~~ activity associated with CP-1 would be expected to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 9 dBA (i.e., 8 dBA less than the 17 dBA maximum increment during the loudest period of CP-2).~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic~~. Similarly, equipment and truck activity associated with CP-3 are predicted~~would be expected~~ to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 10 dBA (i.e., 7 dBA less than the 17 dBA maximum increment during the loudest period of CP2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While noise level increases during CP-1 and CP-3 would be noticeable, total noise levels would remain in the "acceptable" range based on *CEQR Technical Manual* noise exposure criteria and would therefore not rise to the level of significant adverse impact.

~~While construction associated with CP-1 and CP-3 would be expected~~are predicted ~~to result in lower noise levels at 285 Nevins Street located across from the Head End Site staging area (i.e., Receptor 36) than those predicted for CP-2., construction~~ Construction of the Project (i.e., CP-1, CP-2 and CP-3) would ~~associated with CP-1 and CP-3 may~~ result in exceedances of *CEQR Technical Manual* noise impact criteria and would result in a ~~the~~ potential temporary significant adverse impact predicted at the existing residential receptor at 285 Nevins Street located across Nevins Street from the Head End Site staging area (i.e., Receptor 36) ~~this receptor~~ as a result of the magnitude and duration of noise levels during CP-2. ~~may occur at times during the construction associated with CP-1 and CP-3 as well.~~

Receptor 37—Residential Receptor Immediately Adjacent to Head End Site Staging Area

At the residential receptor located at 282 Nevins Street immediately adjacent to the Head End Site Staging Area—Receptor 37—existing weekday noise levels are in the low 50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low 40s~~ mid 50s to low 70s dBA, resulting in noise level increases of up to approximately 20 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of dump trucks and excavators operating during the site excavation portion of CP-2 construction at the Head End Site, with a duration of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the "marginally unacceptable" range based on *CEQR Technical Manual* noise exposure criteria. Noise levels during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) would range from the low 50s to the low 60s dBA, resulting in noise level increases of up to approximately 9 dBA. Based on the high magnitude and the duration of these noise level increases, construction of the Project would have the potential to result in a temporary significant adverse impact at the existing residential receptor at 282 Nevins Street located adjacent to the Head End Site staging area (i.e., Receptor 37). Standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be in the ~~high~~ mid 40s dBA, up to approximately ~~5~~2 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor at 282 Nevins Street adjacent to the Head End Site staging area comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 14 dBA (i.e., 6 dBA less than the 20 dBA maximum increment during the loudest period of CP-2). ~~levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s, resulting in a noise level increase above ambient conditions up to approximately 14 dBA (i.e., 6 dBA less than the 20 dBA maximum increment during the loudest period of CP2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While construction associated with CP-1 and CP-3 would be noticeable, total noise levels would remain in the "acceptable" range based on *CEQR Technical Manual* noise exposure criteria and would therefore not rise to the level of significant adverse impact.

~~While construction associated with CP-1 and CP-3 are predictedexpected to result in lower noise levels at 282 Nevins Street located across from the Head End Site staging area (i.e., Receptor 37) than those predicted for CP-2~~ Construction of the Project (i.e., CP-1, CP-2 and CP-3) would ~~associated with CP-1 and CP-3 may~~ result in ~~exceedances of CEQR Technical Manual noise impact criteria and~~a potential ~~the~~ temporary significant adverse impact predicted at the existing residential receptor at 282 Nevins Street located adjacent to the Head End Site staging area (i.e., Receptor 37) ~~this receptor~~ as a result of the magnitude and duration of noise levels during CP-2~~ may occur at times during the construction associated with CP-1 and CP-3 as well~~.

Receptors 57 and 59—Potential Conservative Analysis Receptors across Nevins Street from Head End Site

At the potential conservative analysis receptors located across Nevins Street from the Head End Site—Receptors 57 and 59—existing weekday noise levels are in the low 50s to low 60s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the low 50s to mid-70s dBA, resulting in noise level increases of up to approximately 17 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of clamshell excavators, cranes and dump trucks during SOE construction at the Head End Site, with a duration of up to approximately 13 months, dump trucks, loaders, excavators, and dozers during site excavation activities at the Head End Site, with a duration of approximately 10 months, and concrete trucks, concrete pumps and tractor trailers making deliveries to the Head End Site with a duration of approximately 24 months during sub-surface construction activities. These activities would occur over the course of the entire 48 months of CP-2 construction. The predicted noise level increases at these residences would be noticeable and potentially intrusive. These activities have the potential to occur over the course of the entire 48 months of CP-2 construction. However, notwithstanding the high magnitude and long duration of these noise level increases, the predicted levels of noise resulting from construction of the Project would not result in a significant adverse impact at the potential conservative analysis receptors located across Nevins Street from the Head End Site (i.e., Receptors 57, and 59), because these receptors only represent the Project's effect on potential future land use changes and do not currently exist. If these locations allow for noise-sensitive uses in the future, noise exposure from construction of the Project and potential measures to mitigate such noise would be considered in a future environmental review.

If noise-sensitive uses were developed on these locations in the future, standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at these conservative analysis receptors during construction would be in the low 50s dBA, up to approximately 9 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the potential conservative analysis receptors across Nevins Street from the Head End Site comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions of up to approximately 10 dBA (i.e., 7 dBA less than the 17 dBA maximum increment during the loudest period of~~than~~ CP-2). ~~because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly~~Construction during~~,~~ CP-3 ~~would be expected~~is predicted to result in ~~lower~~ construction noise levels ~~noise levels~~ up to the mid-70s dBA, resulting in noise level increases above ambient conditions of up to approximately 17 dBA (i.e., comparable to the 17 dBA maximum increment during the loudest period of~~than~~ CP-2). The maximum construction noise levels predicted at these receptors associated with CP-3 would occur during in-street sewer work along Nevins Street, which would occur for up to approximately 4 months. Noise levels during the remaining 20 months of CP-3 when construction is not occurring on Nevins Street directly in front of these receptors, ~~construction~~ would be up to the high 60s dBA, resulting in noise level increases above ambient of up to approximately 8 dBA (i.e., 9 dBA less than the 17 dBA maximum increment during the loudest period of CP-2). While construction noise levels during the loudest activities during CP-3 (i.e., in-street sewer work) would be comparable to the maximum noise levels during CP-2, noise levels during all of CP-1 and the majority of CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, ~~mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While construction associated with CP-1 and CP-3 would result in exceedances of *CEQR Technical Manual* noise impact criteria~~would be expected to result in lower noise levels~~ at the potential conservative analysis receptors across Nevins Street from the Head End Site (i.e., Receptors 57 and 59)~~than those predicted for CP-2, construction associated with CP-1 and CP-3 may result in exceedances of *CEQR Technical Manual* noise impact criteria. However~~, because these receptors only represent the Project's effect on potential future land use changes and currently do not exist, construction associated with CP-1 and CP-3 and therefore the Project as a whole would not result in a significant adverse impact at these receptors.

Construction of the Project (i.e., CP-1, CP-2 and CP-3) does not have the potential to result in a potential temporary significant adverse impact at the potential conservative analysis receptors across Nevins Street from the Head End Site (i.e., Receptors 57 and 59) because these receptors only represent the Project's effect on potential future land use changes and currently do not exist.

Receptor 58—Potential Conservative Analysis Receptor across Gowanus Canal from Head End Site
At the potential conservative analysis receptor located across the Gowanus Canal from the Head End Site—Receptor 58—existing weekday noise levels are in the low 50s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the low 50s to low 70s dBA, resulting in noise level increases of up to approximately 19 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of clamshell excavators, cranes and dump trucks during SOE construction at the Head End Site, with a duration of up to approximately 13 months, dump trucks, loaders, excavators, and dozers during site excavation activities at the Head End Site, with a duration of approximately 10 months, and concrete trucks, concrete pumps and tractor trailers making deliveries to the Head End Site with a duration of approximately 24 months during sub-surface construction activities. These activities would occur over the course of the entire 48 months of CP-2 construction. However, notwithstanding the high magnitude and long duration of these noise level increases, the predicted levels of noise resulting from construction of the Project would not result in a significant adverse impact at the potential conservative analysis receptor located across the Canal from the Head End Site (i.e., Receptor 58), because this receptor only represents the Project’s effect on potential future land use changes and does not currently exist. If this location allows for noise-sensitive uses in the future, noise exposure from construction of the Project and potential measures to mitigate such noise would be considered in a future environmental review.

If noise-sensitive uses were developed at this location in the future, standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, maximum interior noise levels at this residential receptor during construction would be in the high 40s dBA, up to approximately ~~4~~3 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the potential conservative analysis receptor located across the Gowanus Canal from the Head End Site that would be comparable to or less than those for CP-2~~.~~. ~~As discussed in the “Analysis Periods” discussion above, S~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 are predicted ~~would be expected~~ to result in ~~lower~~ construction noise levels up to the high 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 12 dBA (i.e., 7 dBA less than the 19 dBA maximum increment during the loudest period of ~~than~~ CP-2). ~~because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3 are predicted ~~would be expected~~ to result in ~~lower~~ construction noise levels up to the high 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 12 dBA (i.e., 7 dBA less than the 19 dBA maximum increment during the loudest period of ~~than~~ CP-2). Construction noise levels during the loudest activities of CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While noise level increases during~~construction associated with~~ CP-1 and CP-3 would be noticeable, total noise levels would remain in the “acceptable” range based on *CEQR Technical Manual* noise exposure criteria and would therefore not rise to the level of significant adverse impact. While construction associated with CP-1 and CP-3 ~~are~~is predicted~~expected~~ to result in lower noise levels at the potential conservative analysis receptor located across the Gowanus Canal from the Head End Site (i.e., Receptor 58) than those predicted for CP-2, construction associated with CP-1 and CP-3 ~~may~~ would result in exceedances of *CEQR Technical Manual* noise impact criteria. However, because this receptor only represents the Project's effect on potential future land use changes and currently does not exist, construction associated with CP-1 and CP-3 and therefore the Project as a whole would not result in a significant adverse impact at this receptor.

~~Construction of the Project (i.e., CP-1, CP-2, and CP-3) does not have the potential to result in a potential temporary significant adverse impact at the potential conservative analysis receptors across the Gowanus Canal from the Head End Site (i.e., Receptor 58) because this receptor only represents the Project's effect on potential future land use changes and currently does not exist.~~

Receptors 30, 31, and 34—Residential Receptors on Butler Street between Bond Street and 3rd Avenue

At the existing and future potential residential receptors located on Butler Street between Bond Street and 3rd Avenue—Receptors 30, 31, and 34—existing weekday noise levels are in the low to high 50s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the low 50s to low 60s dBA, resulting in noise level increases of up to approximately 9 dBA. The maximum construction noise levels predicted at these receptors would result from excavators, dozers, and dump truck operation at the Head End Site during site excavation activities, and by construction traffic along Butler Street. These activities would occur over the course of up to approximately 10 months. The predicted noise level increases at these receptors would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be considered to be in the "marginally unacceptable" range according to the *CEQR Technical Manual* noise exposure guidelines. Noise levels during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structure activities) would range from the low 50s to the low 60s dBA, resulting in noise level increases of up to approximately 5 dBA. The maximum construction noise levels predicted at these receptors during slabs and below-grade elements removal, SOE, and below-grade structures activities would result from operation of concrete trucks and materials delivery trucks at the Head End Site. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ residential and hotel receptors on Butler Street between Bond Street and 3rd Avenue comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above,~~ Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in a noise level less than 5 dBA, which is below the *CEQR Technical Manual* impact criteria~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic~~. Similarly, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low-60s dBA, resulting in noise level increases above ambient conditions of up to approximately 7 dBA (i.e., 2 dBA less than the maximum increment during the loudest period of ~~than~~ CP-2). Maximum construction noise levels during CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 and CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20~~5~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While noise level increases during CP-1 and CP-3 may be noticeable, total noise levels would remain in the “acceptable” range based on *CEQR Technical Manual* noise exposure criteria and would therefore not rise to the level of significant adverse impact. ~~Consequently, noise levels throughout construction associated with CP-1 and CP-3 would also be in the “clearly acceptable” to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.~~

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the ~~p~~Project would not rise to the level of a significant adverse impact at the residential receptors on Butler Street between Bond Street and 3rd Avenue (i.e., Receptors 30, 31, and 34).

Receptor 50—Future Hotel Receptor across Butler Street from the Head End Site

At the future hotel receptor located at 255 Butler Street across Butler Street from the Head End Site—Receptor 50—existing weekday noise levels are in the low 50s to low 60s dBA. Construction is predicted to produce noise levels at this receptor in the low ~~40s~~ 50s to low 70s dBA, resulting in noise level increases of up to approximately 14 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of excavators, dozers, and loaders operating at the Head End Site during the excavation portion of CP-2 construction over the course of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the “marginally unacceptable” range based on *CEQR Technical Manual* noise exposure criteria. The building’s façade is currently undergoing renovations, and the completed façade construction is expected to include insulated glass windows along with an alternate means of ventilation allowing for the maintenance of a closed-window condition. The completed building façade, with these measures, would be expected to provide approximately 30 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be below the 45 dBA threshold recommended for hotel guestroom use according to the *CEQR Technical Manual* noise exposure guidelines. Therefore construction during CP-2 would not be expected to result in a significant adverse impact at the future hotel receptor located at 255 Butler Street across Butler Street from the Head End Site (i.e., Receptor 50).

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in elevated noise levels at the future hotel receptor at 255 Butler Street across Butler Street from the Head End Site comparable to or less than those for CP-2. ~~As discussed in the “Analysis Periods” discussion above,~~ Stationary equipment and truck volumes associated with CP-1 are predicted ~~would be expected~~ to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions of up to approximately 7 dBA, (i.e., 7 dBA less than the 14 dBA maximum increment during the loudest period of CP-2)~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly,~~ Construction noise levels during CP-3 are predicted ~~would be expected~~ to result in ~~lower~~ construction noise levels in the mid-70s dBA, resulting in noise level increases above ambient conditions up to approximately 14 dBA (i.e., 14.6 dBA, slightly higher than the 14.0 dBA maximum increment during the loudest period of CP-2). Maximum construction noise levels during CP-3 would occur during in-street sewer work along Butler Street and Nevins Street, which would have a duration of up to approximately 4 months. As described above, the completed building façade would be expected to provide approximately 30 dBA window/wall attenuation, which would result in interior noise levels during the loudest portions of CP-3 below the 45 dBA threshold recommended for hotel guestroom use according to the *CEQR Technical Manual* noise exposure guidelines, and therefore would not rise to the level of significant adverse impact. Construction during the remaining 20 months of CP-3 would produce noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions of up to approximately 7 dBA (i.e., 7 dBA less than the 14 dBA maximum increment during the loudest period of CP-2). While noise level increases during CP-1 and the 20 months of CP-3 without in-street sewer work would be noticeable, total noise levels would be in the "acceptable" range based on *CEQR Technical Manual* noise exposure criteria, and therefore would not rise to the level of significant adverse impact. Construction noise levels during the majority of CP-1 and CP-3 (i.e., excluding up to 4 months of in-street sewer work) would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Since construction noise levels during the loudest portions of CP-3 would remain below the recommended threshold for hotel guestroom use and total noise levels during CP-1 and the remainder of CP-3 would remain in the "acceptable" range, noise levels during CP-1 and CP-3 would not rise to the level of significant adverse impact at 255 Butler Street across Butler Street from the Head End Site (i.e., Receptor 50).

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels inside the building would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at 255 Butler Street across Butler Street from the Head End Site (i.e., Receptor 50).

Receptor 33—Residential Receptors along Nevins Street North of Baltic Street

At the residential receptors located along Nevins Street north of Baltic Street—represented by Receptor 33—existing weekday noise levels are in the low 50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the low 50s to low 60s dBA, resulting in noise level increases of up to approximately 9 dBA. The maximum construction noise levels predicted at this receptor would result from excavators, dozers, and dump trucks operating in the loading area of the Head End Site, and construction traffic along Nevins Street during the site excavation activities. These activities would occur over the course of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the "clearly unacceptable" range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structure) are predicted to produce noise levels at this receptor in the low to mid-50s dBA, resulting in noise level increases of up to approximately 5 dBA. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential ~~receptor at the residential~~ receptors located along Nevins Street north of Baltic Street comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise up to the high 50s dBA, resulting in noise level increases less than the 5 dBA *CEQR Technical Manual* impact threshold.~~levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity during CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low 60s, resulting in noise level increases of up to approximately 6 dBA (i.e., 3 dBA less than the 9 dBA maximum increment during the loudest period of CP-2). Construction noise levels during the loudest activities of CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~,~~ ~~mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 would also be in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential receptors located along Nevins Street north of Baltic Street (i.e., Receptor 33).

Receptors 17 and 26—Residential Receptors West of Bond Street with Line of Sight to Head End Site

At the residential receptors located west of Bond Street with line of sight to the Head End Site—Receptors 17 and 26—existing weekday noise levels are in the low 50s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the low 50s to mid-60s dBA, resulting in noise level increases of up to approximately 5 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks operating in the loading area of the Head End Site during site excavation activities and would occur over the course of 10 months. While the predicted noise level increases at these receptors would be noticeable during site excavation activities, the total noise levels would be in the "clearly acceptable" range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low 50s to mid-60s dBA, resulting in noise level increases of less than 5 dBA, which is below the *CEQR Technical Manual* threshold for significant impact.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential ~~receptor at residential~~ receptors west of Bond Street with line of sight to the Head End Site comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~ are predicted to result in ~~lower~~ construction noise up to the mid 60s dBA, resulting in noise level increases above ambient conditions below the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, mainly in the form of material deliveries, which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 ~~would also~~are predicted to be less than *CEQR Technical Manual* noise impact criteria.

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential receptors west of Bond Street with line of sight to the Head End Site (i.e., Receptors 17 and 26).

Receptors 38 and 42—Residential and Hotel Receptors on Union Street with Line of Sight to Head End Site

At the residential and hotel receptors located on Union Street with line of sight to the Head End Site—Receptors 38 and 42—existing weekday noise levels are in the low to high 50s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the low 50s to low 60s dBA, resulting in noise level increases of up to approximately 7 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks operating in the loading area of the Head End Site and construction traffic along Sackett Street during site excavation activities. These activities would occur over the course of up to approximately 10 months. The predicted noise level increases at these receptors would be noticeable and potentially intrusive during site excavation activities, however, the total noise levels would be in the "clearly acceptable" range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low 50s to low 60s dBA, resulting in noise level increases of less than 5 dBA, which is below the *CEQR Technical Manual* threshold for significant impact.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor ~~at the residential~~ and hotel receptors located on Union Street with line of sight to the Head End Site comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions below the 5 dBA *CEQR Technical Manual* threshold for significant impact.~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, ~~mainly in the form of material deliveries,~~ which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 would ~~also~~ be less than *CEQR Technical Manual* noise impact criteria.

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential and hotel receptors located on Union Street with line of sight to the Head End Site (i.e., Receptors 38 and 42).

Receptor 35—Thomas Greene Playground and Douglass and Degraw Pool across Nevins Street
At the Thomas Greene Playground—Receptor 35—existing ambient noise levels are in the mid-50s to mid-60s dBA and existing condition noise levels at the Douglass and Degraw pool (i.e., Receptor 35P) are in the mid-60s dBA when the pool is in us, due to noise generated by use of the pool. Construction during CP-2 is predicted to produce noise levels throughout most of the Playground (i.e., the portion of the Playground other than the handball courts along Nevins Street) in the low to high 50s dBA, resulting in noise level increases of up to approximately 5 dBA during the most noise-intensive periods of construction. However, at the handball courts at the westernmost portion of the Playground, which are immediately across Nevins Street from the Head End Site, construction of CP-2 is predicted to result in noise levels up to the high 60s dBA, resulting in noise level increases of up to approximately 10 dBA.

The predicted noise level increases at these open space locations would be noticeable, and would exceed the *CEQR Technical Manual* impact criteria, and the total noise levels would exceed the 55 dBA L_{10} noise level recommended by the *CEQR Technical Manual* for passive open spaces by up to approximately 17 dBA in the western portion of the Playground and up to approximately 15 dBA in the remainder of the Playground. However, noise levels in this area already exceed CEQR-recommended values under the existing condition. The CEQR guidelines, which provide for a relatively low noise level, intended as a goal for outdoor areas requiring serenity and quiet, such as passive open spaces, are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks. Therefore, the total noise levels would be comparable to the measured existing noise levels at site 10, and in the range considered typical for the Gowanus Canal area.

The highest noise levels at the handball courts in the western portion of the Playground would be produced as a result of excavators, dump trucks and concrete delivery trucks operating at the Head End Site, and by construction traffic along Nevins Street, and would have the potential to occur over the course of the entire 48-month duration of CP-2 construction. The predicted noise level increases at the handball courts would be noticeable and would exceed *CEQR Technical Manual* impact criteria. However, the handball courts are used for active recreation, and therefore are not as sensitive to noise as a purely passive open space. Furthermore, the predicted noise levels during construction are comparable to existing noise levels at other handball courts and active recreation areas in New York City in proximity to heavily trafficked roadways or other urban noise sources. Furthermore, construction of the Project would occur during weekday daytime hours, leaving the Playground unaffected by noise during evenings and weekends, which are primary times of use for the Playground. Consequently, noise levels as a result of CP-2 construction are not predicted to result in a significant adverse impact at the western portion of the Thomas Greene Playground; therefore, the predicted levels of noise resulting from construction of the Project would not constitute a significant adverse impact at the handball courts.

The highest noise levels at the Douglass and Degraw Pool in the western portion of the Playground would be produced as a result of excavators, dump trucks and concrete delivery trucks operating at the Head End Site, and by construction traffic along Nevins Street, and would have the potential to occur over the course of the entire 48-month duration of CP-2 construction. While construction noise may be audible and noticeable at the Pool during some construction activities, the predicted noise level increases at the Pool would not exceed *CEQR Technical Manual* impact criteria and the total noise levels during construction would be comparable to those when the Pool is in use. Consequently, the predicted levels of noise resulting from construction of the Project would not constitute a significant adverse impact at the Douglass and Degraw Pool.

Construction during CP-2 is predicted to produce noise levels in the high 50s to low 60s dBA at passive recreation areas in the eastern portion of the Thomas Greene Playground (i.e., near benches and pathways), resulting in noise level increases of less than 5 dBA which is below the *CEQR Technical Manual* threshold for significant impact.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in elevated noise levels at Thomas Greene Playground comparable to or less than those for CP-2. At the western portion of the playground, ~~. As discussed in the “Analysis Periods” discussion above, ~~stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases above ambient conditions of approximately 5 dBA (i.e., 5 dBA less than the 10 dBA maximum increment during CP-2). At the remainder of the Playground, including the Douglass and DeGraw Pool, construction associated with CP-1 is predicted to result in noise level increments less than the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, at the western portion of the playground, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels in the high 60s dBA, resulting in noise level increases above ambient conditions up to approximately 10 dBA (i.e., comparable to the 10 dBA maximum increment during CP-2). At the remainder of the Playground, including the Douglass and DeGraw Pool, construction associated with CP-3 is predicted to result in noise level increments below the 5 dBA *CEQR Technical Manual* threshold for significant impact. Construction noise levels during the loudest activities during CP-1 would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1~~3~~ (i.e., demolition debris removal) would be approximately 20~~5~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 ~~would also~~are predicted to be less than *CEQR Technical Manual* noise impact criteria at the passive recreation areas of the Thomas Greene Playground (i.e., near benches and pathways) in the eastern portion of the Playground.

Because the maximum construction noise levels predicted to occur at the eastern portion of the Playground receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the eastern portion of the Playground.

~~While c~~Construction associated with CP-1 and CP-3 ~~would be expected~~is predicted ~~to~~ to exceed the *CEQR Technical Manual* noise impact criteria but result in comparable to or lower noise levels at the western portion of the Thomas Greene Playground than those predicted for CP-2~~, construction associated with CP-1 and CP-3 may result in exceedances of *CEQR Technical Manual* noise impact criteria~~. However, because this portion of the Playground is used for active recreation, and therefore, is not as sensitive to noise as a purely passive open space and construction of the Project would occur during weekday daytime hours, leaving the Playground unaffected by noise during evenings and weekends, which are primary times of use for the Playground, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the western portion of Thomas Greene Playground.

Receptor 39—Whole Foods Market Open Space across the 4th Street Basin from Owls Head Site

At the Whole Foods Market open space across the 4th Street Basin from the Owls Head site—Receptor 39—existing weekday noise levels are in the low 50s dBA. Construction during CP-2 is predicted to produce noise levels at western portions of the open space in the ~~low~~ mid 50s to ~~high~~low ~~50s~~ 60s dBA, resulting in noise level increases of up to approximately 5 dBA during the most noise-intensive periods of construction. The predicted noise level increases at this open space location would be noticeable but would be in the range considered typical for the Gowanus Canal area. Total noise levels would exceed the 55 dBA L_{10} noise level for passive open spaces by up to approximately 10 dBA. However, noise levels in this area already exceed CEQR-recommended values under the existing condition. The CEQR guidelines, which provide for a relatively low noise level, intended as a goal for outdoor areas requiring serenity and quiet, such as passive open spaces, are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks. Therefore, the total noise levels would be comparable to the measured existing noise levels at site 11, and in the range considered typical for the Gowanus Canal area.

The predicted noise level increases at the Open Space would be noticeable and would exceed the *CEQR Technical Manual* impact criteria during site excavation activities. These activities would occur over the course of the 10 months. During the remaining 38 months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities), noise level increases would not exceed *CEQR Technical Manual* impact criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the Whole Foods Market open space (i.e., Receptor 39) comparable to or less than those during CP-2. ~~As discussed in the “Analysis Periods” discussion above,~~ S~~s~~tationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 50s dBA, resulting in noise level increases above ambient conditions below the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels than CP-2~~ Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 would ~~also~~ be less than *CEQR Technical Manual* noise impact criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential receptor located at the Whole Foods Market open space (i.e., Receptor 39).

Receptor 28—Residential Receptor along Gowanus Canal with Line of Sight to Owls Head Site

At the residential receptor located at 365 Bond Street along the Gowanus Canal with line of sight to the Owls Head Site—Receptor 28—existing weekday noise levels are in the low 50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the low to high 50s dBA, resulting in noise level increases of up to approximately 7 dBA. The maximum construction noise levels predicted at this receptor would result from dump trucks, excavators, and dozers operating at the Owls Head site during site excavation activities, occurring over the course of approximately 10 months. The predicted noise level increases at 365 Bond Street would be noticeable and potentially intrusive and the total noise levels would be in the "marginally acceptable" range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at this receptor in the low 50s to mid-60s dBA, resulting in noise level increases of less than 5 dBA, which is below the *CEQR Technical Manual* threshold for significant impact.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ existing residential receptors located at 365 Bond Street along the Gowanus Canal with line of sight to the Owls Head Site comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above,~~ S~~s~~tationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid-50s dBA, resulting in noise level increases above ambient conditions below the 5 dBA *CEQR Technical Manual* threshold for significant impact. Construction noise levels during the loudest activities during CP-1 and CP-3 would be less ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, mainly in the form of material deliveries, which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 would ~~also~~ be less than *CEQR Technical Manual* noise impact criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable to marginally acceptable range throughout the entirety of the construction period at this receptor, noise produced by construction of the project would not rise to the level of a significant adverse impact at the existing residential receptors located at 365 Bond Street along the Gowanus Canal with line of sight to the Owls Head Site (i.e., Receptor 28).

Receptors 56 and 60—Future Conservative Analysis Receptors across Gowanus Canal from Owls Head Site

At the future potential conservative analysis receptors located across the Gowanus Canal from the Owls Head Site—Receptors 56 and 60—existing weekday noise levels are in the low to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the mid-50s to mid-60s dBA, resulting in noise level increases of up to approximately 13 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks, excavators, and bulldozers operating at the Owls Head site during site excavation activities, occurring over the course of approximately 10 months. The predicted noise level increases at these receptors would be noticeable and potentially intrusive and the total noise levels would be in the "clearly unacceptable" range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38 months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low to high 50s dBA, resulting in noise level increases of approximately 7 dBA. The maximum construction noise levels predicted at these receptors during these stages of CP-2 construction would result from the operation of clamshell excavators, hydromill excavators, and cranes. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ future potential conservative analysis receptors located across the Gowanus Canal to the Owls Head Site comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 50s dBA, resulting in noise level increases up to approximately 8 dBA above ambient conditions (i.e., 5 dBA less than the 13 dBA maximum increment during the loudest period of CP-2). ~~levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3 ~~would be expected~~is predicted to result in ~~lower~~ construction noise levels up to the mid 50s dBA, resulting in noise level increases above ambient conditions of up to approximately 6 dBA (i.e., 7 dBA less than the 13 dBA maximum increment during the loudest period of CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. ~~Consequently,~~ While noise level increases during CP-1 and CP-3 may be noticeable, total noise levels throughout construction associated with CP-1 and CP-3 would also be in the "clearly acceptable" ~~to "marginally acceptable"~~ range according to *CEQR Technical Manual* noise exposure criteria. ~~Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration (approximately 10 months), and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the project would not rise to the level of a significant adverse impact at the future potential conservative analysis receptors located across the Gowanus Canal from the Owls Head Site (i.e., Receptors 56 and 60).~~

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the project would not rise to the level of a significant adverse impact at the future potential conservative analysis receptors located across the Gowanus Canal from the Owls Head Site (i.e., Receptors 56 and 60).

Receptors 61 and 62—Gowanus Canal

At the Gowanus Canal—Receptors 61 and 62—the existing weekday noise levels are in the low 50s dBA. Construction during CP-2 is predicted to produce noise levels in the mid-50s to mid-60s dBA, resulting in noise level increases of up to approximately 10 dBA during the most noise-intensive periods of construction.

The highest noise levels at the Canal would be produced as a result of dump trucks and excavators operating at both the Head End and Owls Head Sites, and would have the potential to occur over the course of the entire 48-month duration of CP-2 construction. While the predicted noise level increases at the Canal would be noticeable and would exceed *CEQR Technical Manual* impact criteria, the Canal is used for active recreation, and therefore, is not as sensitive to noise as a purely passive open space. Furthermore, construction of the Project would occur during weekday daytime hours, leaving the Canal unaffected by noise during evenings and weekends, which are primary times of use for the Canal. In addition, the affected area of the Canal is only a relatively minor portion; the active recreation users would be able to utilize the remaining portion of the Canal not adjacent to construction noise if their experience is affected by the construction noise.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the Gowanus Canal comparable to those during CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions of approximately 7 dBA (i.e., 3 dBA less than the 10 dBA maximum increment during CP-2).~~levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly,~~ Construction noise levels during the loudest activities during CP-1 and CP-3 would be less ~~CP-3 would be expected to result in lower construction noise levels~~ than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, mainly in the form of material deliveries, which would result in lower levels of truck traffic. While construction associated with CP-1 and CP-3 ~~would be~~ is predicted ~~expected~~ to result in lower noise levels at the Gowanus Canal than those predicted for CP-2, construction associated with CP-1 and CP-3 ~~may~~ is predicted to result in exceedances of CEQR Technical Manual noise impact criteria.

Because the Canal is used for active recreation, and therefore, is not as sensitive to noise as a purely passive open space, because construction of the Project would occur during weekday daytime hours, leaving the Canal unaffected by noise during evenings and weekends, which are primary times of use for the Canal, and because the affected area of the Canal is a relatively minor portion and active recreation users could utilize the remaining portions of the Canal, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the Gowanus Canal (i.e., Receptors 61 and 62).

All Other Receptors

At all other receptors in the study area, construction during CP-2 is predicted to produce noise levels below the existing noise levels and would not rise to the level of significant adverse impact. ~~As discussed in “Analysis Periods” above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 (site preparation, utility relocation and abatement, and demolition) and CP-3 (above-grade structures, conveyances, and outfalls) would ~~would be expected to~~ result in comparable to or lower construction noise levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~10~~ percent of the total volume during CP-2~~, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 (above-grade structures, conveyances, and outfalls) would be expected to result in lower construction noise levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-3 would be approximately 25 percent of the total volume during CP-2, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Because the maximum construction noise levels predicted to occur at these receptors would not rise to the level of significant adverse impact, noise produced by construction of the Project would not rise to the level of a significant adverse impact at all other receptors not already discussed.

CONSTRUCTION NOISE ANALYSIS CONCLUSION

Construction of the Project is predicted to result in elevated noise levels at several of the analyzed receptors, which represent the residences, hotels, and publicly accessible open spaces.

At the residential receptors at 282 Nevins Street and 285 Nevins Street, located adjacent to and across Nevins Street from the Head End Site staging area, respectively—Receptors 36 and 37—the Project is predicted to result in potential temporary significant adverse construction noise impacts. Construction of the Project would result in noticeable and potentially intrusive increases in noise levels at these receptors intermittently over the course of construction, ~~during CP-2 this is~~ primarily as the result of dump trucks and activities in the Head End Site staging area and construction traffic along Nevins Street. ~~Although construction of the Project would result in noise level increases during CP-1 and CP-3 construction that would be less than those during CP-2 construction, these increases may still result in exceedances of *CEQR Technical Manual* noise impact criteria.~~ Potential mitigation measures for the predicted construction noise impacts at these receptors are discussed further in Chapter 23 “Mitigation.”

At potential conservative analysis receptors identified to conservatively evaluate the Project’s effect on potential future land use changes across the Canal and Nevins Street from the Head End Site—Receptors 57, 58 and 59—the Project would not result in potential significant adverse construction noise impacts because these receptors only represent the Project’s effect on potential future land use changes and currently do not exist. If noise-sensitive uses were developed on these locations in the future, construction of the Project would result in noticeable and potentially intrusive increases in noise levels at these receptors intermittently over the course of ~~CP-2~~ construction, primarily as the result of dump trucks in the Head End Site staging area and construction traffic along Nevins Street. ~~Although construction of the Project would result in noise level increases during CP-1 and CP-3 construction that would be less than those during CP-2 construction, these increases may still result in exceedances of *CEQR Technical Manual* noise impact criteria.~~ If these locations allow for noise sensitive uses in the future, noise exposure from construction of the Project and potential measures to mitigate such noise would be considered in a future environmental review.

At open space areas in the vicinity of the proposed construction work areas, including Thomas Greene Playground, the Whole Foods Market Open Space, and the Gowanus Canal, noise levels during construction would exceed *CEQR Technical Manual* noise impact criteria and *CEQR Technical Manual* noise exposure guidelines, although existing noise levels at these locations already exceed these noise exposure guidelines. While total construction noise levels at these receptors would be noticeable and potentially intrusive during the most intensive construction activities ~~(CP-2)~~, they would be in the typical range for the Gowanus Canal area and would not occur during the evening and weekend time periods that are the primary times of use for these areas. Further, the western portion of Thomas Greene Playground and the Gowanus Canal are primarily used for active recreation, and are consequently not as sensitive to noise as purely passive open space. Consequently, the predicted levels of construction noise were not determined to rise to the level of a significant adverse effect at any open space receptors in the vicinity of the Project Sites.

Noise levels ~~A~~at other receptors near the construction work areas, while during the most intensive construction activities ~~(CP-2)~~ would be noticeable and potentially intrusive at times, ~~they~~ would be in the range considered typical for the Gowanus Canal area. Further, the highest construction noise levels are predicted to occur for relatively short periods of time at most receptors, and would occur during weekday daytime hours when residences, open spaces, and hotels are typically least sensitive to noise. Furthermore, the surrounding residences and hotels are constructed with insulated glass windows and appear to have alternate means of ventilation (i.e., air conditioning), which would allow for the maintenance of a closed window condition and consequently reduced interior noise levels. Similarly, future hotels and residences are expected to be constructed with insulated glass windows and an alternate means of ventilation (i.e., air conditioning). Therefore, the predicted levels of construction noise were determined not to rise to the level of a significant adverse effect at these residential, hotel, or other indoor noise receptors.

F. CONSTRUCTION VIBRATION

INTRODUCTION

Construction activities have the potential to result in vibration levels that may in turn result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. In general, vibratory levels at a receiver (a structure that could experience vibration) are a function of the source strength (which in turn is dependent upon the construction equipment and methods utilized), the distance between the equipment and the receiver, the characteristics of the transmitting medium (i.e., the ground, roads, and soil), and the construction of the receiver building. Construction equipment operation causes ground vibrations that spread through the ground and decrease in strength with distance. Vehicular traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels unless there are discontinuities in the roadway surface. With the exception of the case of fragile and possibly historically significant structures or buildings, generally construction activities do not reach the levels that can cause architectural or structural damage, but can achieve levels that may be perceptible in buildings close to a construction site. An assessment has been prepared to quantify potential vibration effects of construction activities on structures and residences near the Project site.

METHODOLOGY

Potential structural or architectural damage are determined based on the vibration impact criterion used by the Landmarks Preservation Committee (LPC) of a peak particle velocity (PPV) of 0.50 inches/second. For non-fragile buildings, vibration levels below 0.60 inches/second would not be expected to result in any structural or architectural damage.

Vibration levels greater than 65 vibration decibels (VdB) would have the potential to be annoying or interfere with vibration sensitive activities, and would result in significant adverse effects if they were to occur for a prolonged period of time.

VIBRATION ANALYSIS

Potential structural or architectural damage is determined using the following formula:

$$PPV_{equip} = PPV_{ref} \text{ x } (25/D)^{1.5}$$

where: PPV_{equip} is the peak particle velocity in inches/second of the equipment at the receiver location;

PPV_{ref} is the reference vibration level in in/sec at 25 feet; and

D is the distance from the equipment to the received location in feet.

Potential annoyance or interference with vibration-sensitive activities is assessed using the following formula:

$$L_v(D) = L_v(ref) - 30\log(D/25)$$

where: $L_v(D)$ is the vibration level in VdB of the equipment at the receiver location;
$L_v(ref)$ is the reference vibration level in VdB at 25 feet; and
D is the distance from the equipment to the receiver location in feet.

Table 20-36 shows vibration source levels for typical construction equipment.

Table 20-36
Vibration Source Levels for Construction Equipment

Equipment	PPV_{ref} (in/sec)	Approximate L_v (ref) (VdB)
Pile Driver (Sonic)	0.170-0.734	93-105
Clam Shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall in rock)	0.017	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006.		

PROBABLE IMPACTS OF THE PROJECT

The buildings of most concern with regard to the potential for structural or architectural damage due to vibration are historic buildings and structures adjacent to the Head End and Owls Head Sites (i.e., the ASPCA Memorial Building, the Former R.G. Dunn and Company Building, and other buildings within the 2014 S/NR –eligible Gowanus Canal Historic District as directed by SHPO and LPC) and the Gowanus Canal structures and systems (i.e., the Canal's bulkheads, pumps, sewer outlets, bridges, etc.) Pending consultation with DEP, SHPO and LPC, historic buildings and structures located within 90 feet of the Project sites would require vibration monitoring per DOB's *Technical Policy and Procedure Notices (TPPN) #10/88* regulations, and PPV during construction would be prohibited from exceeding the 0.50 inches/second threshold (see Chapter 7 "Historic and Cultural Resources").

The piece of equipment that would have the most potential for producing levels that exceed the 0.6 in/sec PPV acceptable vibration level threshold for non-historic buildings and other structures immediately adjacent to the Project sites would be the clamshell excavator. According to **Table 20-36**, clamshell excavators are expected to provide maximum vibration levels of about 0.202 in/sec PPV at the reference distance of 25-feet. Non-historic buildings and other structures bordering the Project sites are greater than 25 feet away from the proposed locations of clamshell excavator operations. Therefore, PPV vibration levels from Project activities are not expected to exceed the 0.6 in/sec threshold for non-historic buildings and structures. However, where appropriate, DEP may require the contractor to provide vibration monitoring of all residential buildings or other buildings sensitive to vibration, regardless of historic status, within 90 feet of the Project Sites.

The piece of equipment that would have the most potential for producing levels that exceed the 65 VdB threshold of perceptibility would be the clamshell excavator. Vibration resulting from operation of the clamshell excavator would be perceptible at receptors within approximately 230 feet of the clamshell excavator slurry wall location. However, slurry wall excavation would only occur for a limited period of time at any particular location, and therefore, would not result in extended periods of perceptible or annoying vibration that would constitute a significant adverse impact.

CONSTRUCTION VIBRATION ANALYSIS CONCLUSION

Historic buildings and other structures located within 90 feet of the Project sites, as appropriate, would incorporate vibration monitoring, and PPV during construction would not be permitted to exceed the 0.50 inches/second threshold. Vibration-producing equipment would not operate in proximity to non-historic structures that could potentially result in damage to these structures. Furthermore, construction of the Project would not result in extended periods of perceptible or annoying vibration at surrounding receptors. Therefore, construction of the Project would not have the potential to result in significant adverse vibration impacts.

G. LAND USE AND NEIGHBORHOOD CHARACTER

LAND USE

Construction activities would affect land use on the Project Sites, but would not affect land use conditions and patterns outside of these areas. As is typical with construction projects, during periods of peak activity there would be some temporary effects to the nearby areas. There would be construction trucks and construction workers coming to the Project Sites as well as trucks and other vehicles backing up, loading, and unloading. These activities would be temporary in nature and would have limited effects on land uses near the Project Sites, particularly as most construction activities would take place within the Project Sites or within portions of sidewalk and streets immediately adjacent to the Project Sites. Overall, the temporary and localized nature of construction would not result in any significant adverse impacts on local land use patterns of the nearby area.

NEIGHBORHOOD CHARACTER

Construction activities would adhere to the provisions of the New York City Building Code and other applicable regulations. In addition, throughout the construction period, measures would be implemented to control noise, vibration, and air emissions including dust. Fencing would be erected to reduce potentially undesirable views of construction areas, to buffer noise emitted from construction activities, and to protect the safety of pedestrians during construction. Access to surrounding residences and businesses would be maintained throughout the duration of the construction period. Overall, construction activity would be localized and would not alter the character of the larger neighborhoods surrounding the Project Sites.

H. SOCIOECONOMIC CONDITIONS

Construction activities could temporarily affect pedestrian and vehicular access to businesses near the Project Sites. However, the lane and/or sidewalk closures needed to accommodate construction of the Project would not obstruct entrances to any existing businesses and businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. MPT plans would be developed and implemented to ensure that access to existing businesses near the Project Sites would be maintained throughout the construction period.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits near the Project Sites created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes. Construction activities associated with the Project would not result in any significant adverse impacts on socioeconomic conditions.

I. COMMUNITY FACILITIES AND SERVICES

With the exception of the DSNY facility on a portion of the Owls Head Site, no community facilities (i.e., public or publicly funded schools, libraries, child care centers, health care facilities, and fire and police stations) would be directly affected by construction activities. DSNY operations may be relocated within the site for the Owls Head Facility but are expected to be maintained throughout the Project's construction period. Access to the composting facility and GCC activities may be displaced during construction; however, once the Owls Head Facility is operational, access for these activities could be restored and therefore would not be adversely affected by the Project. Measures outlined in the MPT Plans would ensure that lane closures and sidewalk closures are kept to a minimum and that adequate pedestrian access is maintained. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care facilities. New York City Police Department (NYPD) and the Fire Department City of New York (FDNY) emergency services and response times would not be materially affected by construction primarily due to the geographic distribution of the police and fire facilities and their respective coverage areas. In addition, emergency vehicle access to the Project Sites would be maintained throughout the construction period.

J. OPEN SPACE

There are no publicly accessible open spaces within the Project Sites and no open space resources would be used for staging or other construction activities. The nearest open space resources are the Thomas Greene Playground to the east of the Heads End Site across Nevins Street between Douglass and Degraw Streets and the Canal. Access to these open space resources or any nearby open space resources would be maintained throughout the duration of the construction period.

Construction of the Project would be required to follow the requirements of the *Local Law 77 of 2003 and DEP Construction Dust Rules* to minimize the air quality effects of the Project's construction activities on nearby open space resources. As presented above under "Air Quality," the detailed air modeling analysis predicted that construction associated with the Project would not result in any significant adverse air quality impacts on nearby open spaces. There is the potential for temporary odors during disturbance of MGP- or petroleum-contaminated soil at both the Head End and Owls Head Sites. To assess and mitigate odors to the greatest extent practicable, DEP would implement a CAMP during these activities. As discussed in Chapter 10, "Hazardous Materials," all necessary means would be employed to prevent on- and off-site odor nuisances. Odor control procedures could include: limiting the area of open excavations; shrouding excavations with tarps and other appropriate covers; and/or use of foams, sprays or misting systems. Appropriate regulatory agencies would be notified of any such odor issues. Therefore, construction associated with the Project would not result in any significant adverse air quality impacts on nearby open spaces.

Construction of the Project would be required to follow the requirements of the *NYC Noise Control Code* to minimize the noise effects of the Project's construction activities on nearby open space resources. As discussed above in "Noise," at open space areas in the vicinity of the proposed construction work areas, including Thomas Greene Playground, the Whole Foods Market Open Space, and the Gowanus Canal, noise levels during construction would exceed *CEQR Technical Manual* noise impact criteria and *CEQR Technical Manual* noise exposure guidelines, although existing noise levels at these locations already exceed these noise exposure guidelines. While total construction noise levels at these receptors would be noticeable and potentially intrusive during the most intensive construction activities (CP-2), they would be in the typical range for the Gowanus Canal area and would not occur during the evening and weekend time periods that are the primary times of use for these areas. Further, the western portion of Thomas Greene Playground and the Gowanus Canal are primarily used for active recreation, and are consequently not as sensitive to noise as a purely passive open space. Consequently, the predicted levels of construction noise were determined not to rise to the level of a significant adverse effect at any open space receptors in the vicinity of the Project Sites.

K. HISTORIC AND CULTURAL RESOURCES

According to the *CEQR Technical Manual*, construction impacts to historic and cultural resources considers the potential for physical damage to archaeological resources and architectural resources, as identified and summarized in Chapter 7, “Historic and Cultural Resources.”

ARCHAEOLOGICAL RESOURCES

Portions of the Head End Site and Nevins Street are considered to have low sensitivity for deeply buried prehistoric archaeological resources and historic archaeological resources associated with a historic mill complex at depths greater than 10 to 15 feet below grade. The Head End Site is also highly sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature though there is a low likelihood that these resources would yield significant information that could not be recovered through other methods, such as documentary research. Archaeological monitoring has been recommended for the Head End Site and Nevins Street, which are potentially sensitive for prehistoric archaeological sites, remnants from a historic tide mill complex, and for areas where the historic Gowanus Canal bulkhead and cribbing would be affected by the Project. No further action is proposed to investigate industrial sites or the Battle Action Corridor associated with the Battle of Brooklyn.

The Owls Head Site is sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature. Although it is likely that the Owls Head study area is situated within what has been identified as a Revolutionary War Battle Action Corridor associated with the 1776 Battle of Brooklyn, it has been determined that it is unlikely that any archaeological resources associated with the Revolutionary War would have survived subsequent development on the project site. While unlikely, undisturbed portions of the 7th Street streetbed are potentially sensitive for the presence of human remains associated with the Battle of Brooklyn. If human burials or disarticulated human remains are present on the Owls Head Site, they would likely be in poor condition as a result of historic disturbance and the construction of the utilities currently present on this site. Any human remains are expected to be located below 20th century fill layers and modern disturbances. If archaeological resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

As the Gowanus Canal bulkheads are S/NR-eligible, removal and replacement of the bulkhead at the Owls Head Site would result in a potential significant adverse impact. Therefore, consultation is being undertaken with SHPO and LPC to identify measures to avoid, minimize, or mitigate potential adverse impacts.

Consultation with SHPO and LPC is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites. Archaeological analysis of the Project Sites determined that additional research on potential archaeological resources may be redundant and unwarranted, therefore, an archaeological monitoring plan will be prepared that will identify the horizontal and vertical locations of Project elements that have the potential to impact archaeological resources and will describe monitoring procedures, including an unanticipated discoveries plan. Implementation of this monitoring plan would be sufficient to avoid, minimize, or mitigate adverse impacts of the Project.

ARCHITECTURAL RESOURCES

PROJECT SITES

The Head End Site is located within the boundaries the S/NR-eligible ~~of a proposed 2014~~ Gowanus Canal Historic District ~~that did not go forward but was subsequently determined State/National Register (S/NR) eligible by SHPO~~.

The buildings at 234 Butler Street that include the two-story former Gowanus Station and associated one-story extensions on Butler and Nevins Streets and the buildings at 270 Nevins Street and 242-244 Nevins Street are contributing resources to the S/NR-eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that ~~and~~ their demolition, which is necessary to complete the Project as mandated by USEPA, would constitute a significant adverse impact to ~~architectural resources~~the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. ~~Therefore, consultation with SHPO and LPC is being undertaken to explore measures to avoid, minimize, and mitigate the demolition of these buildings, including preparation of a feasibility study that would evaluate the potential of retaining the buildings in a manner that would allow the Project to meet its goals and objectives~~.

As discussed in Chapter 1, “Project Description,” the Project is mandated by USEPA to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, or Superfund) and would require permits from USACE or equivalencies from USEPA. As such, the Project is subject to Section 106 of the NHPA. Here, the NHPA requires that USEPA take into account the effects of the Project on historic properties and requires consultation with SHPO. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA, in consultation with SHPO and the City, will seek ways to minimize or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition, as described below.

USEPA’s Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery (Settlement Agreement) directs DEP to construct the Head End Facility at the recommended location (i.e., the Head End Site). The preferred and proposed layout of the below-grade CSO structure at the Head End Site extends from the property line in the North facing Butler Street, to the property line in the South facing Degraw Street, to the property line in the East facing Nevins Street, and to the USEPA-mandated 50-foot setback from the Canal to the West. This layout provides for a shallower, larger footprint that has key benefits to facility operations and both the construction cost and schedule. As discussed in Chapter 7, “Historic and Cultural Resources,” DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades. If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, and as discussed above, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available.) In addition, if feasible, DEP would ~~explore the potential~~incorporate some ~~to~~ salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

OWLS HEAD SITE

The buildings on the Owls Head Site are utilitarian structures that are not distinguished architecturally and do not contribute to the significance of the 2014 S/NR-eligible Gowanus Canal Historic District. Therefore, demolition of the buildings on the Owls Head Site would have no significant adverse impacts on architectural resources.

STUDY AREA

Two individually S/NR-eligible architectural resources are located within 90 feet of the Head End Site: the ASPCA Memorial Building and the Former R.G. Dunn and Company Building. To avoid any inadvertent construction-related impacts to these resources during project construction, a Construction Protection Plan (CPP) would be prepared and implemented in consultation with SHPO and LPC and in conformance with DOB's TPPN #10/88. In addition, other properties located within the S/NR-eligible Gowanus Canal are located within 90 feet of the Head End Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken among DEP and SHPO to determine what protection measures may be needed for these properties, if any, during construction of the Project.

There are no individually S/NR-eligible architectural resources within 90 feet of the Owls Head Site. Properties located within the 2014 S/NR-eligible Gowanus Canal Historic District are located within 90 feet of the Owls Head Site, including the Gowanus Canal and its bulkheads, and consultation is being undertaken among DEP and SHPO, to determine what protection measures may be needed for these properties during construction of the Project.

Potential in-street sewer line improvements would be constructed in the vicinity of the Head End and Owls Head Sites. These improvements would be constructed within the boundaries of the 2014 S/NR-eligible Gowanus Canal Historic District, and also within 90 feet of properties that have been identified as individually S/NR-eligible, including the Pumping Station, the ASPCA Memorial Building, the former R.G. Dunn and Company Building, and the Kentile Building Complex. Consultation is being undertaken among DEP and SHPO to determine what additional protection measures may be required for these properties to supplement standard DEP procedures for undertaking such construction.

L. NATURAL RESOURCES

FLOODPLAINS

New York City, including the area surrounding the Gowanus Canal, is affected by local stormwater flooding (e.g., flooding of inland portions of the City from short-term, high-intensity rain events in areas with poor drainage), fluvial flooding (e.g., streams overflowing their banks), and coastal flooding (e.g., long and short wave surges that affect the shores of the Atlantic Ocean, bays such as Gowanus Bay, and tidally influenced canals, creeks, and rivers). Within New York City, coastal flooding is the primary cause of flood damage. Because coastal flooding is controlled by astronomic tides and meteorological forces (e.g., nor'easters and hurricanes) and is unaffected by occupancy of the floodplain, construction of the Project would not affect the flood elevation or result in increased risk due to flooding in the vicinity of the Project sites.

WETLANDS

Modifications to outfall RH-038 at the Head End Site may result in temporary disturbance of 550 square feet of NYSDEC littoral zone tidal wetlands due to installation of a turbidity curtain and temporary cofferdam. Construction of outfall OH-007 at the Owls Head Site would have the potential to result in temporary disturbance of about 500 square feet of NYSDEC littoral zone tidal wetlands in the immediate vicinity of the outfall location due to installation of a turbidity curtain and temporary cofferdam. Portions of the Owls Head Facility would also be constructed within the NYSDEC-regulated tidal wetland adjacent area. DEP would explore options for avoiding wetland impacts, and if impacts are unavoidable, would consider mitigation options in consultation with USACE, NYSDEC, and USEPA. Sediment and Erosion Control protective measures, such as turbidity curtains, silt fences, and inlet protection, would be utilized in accordance with the SWPPP prepared for the Project to prevent and minimize indirect impacts to wetlands during construction.

AQUATIC RESOURCES

Cofferdam installation and removal would have the potential to result in impacts to aquatic resources from temporary increases in suspended sediment and underwater noise. However, any sediments and associated contaminants resuspended during installation and removal of the cofferdams would be contained within turbidity curtains. Any sediment resuspension resulting from installation and removal of the turbidity curtains would be localized and would dissipate relatively quickly with the improved water flow provided by the Flushing Tunnel. Re-suspended sediment would settle over sediments with similar levels of contamination. Therefore, in-water construction would not result in adverse impacts to water or sediment quality.

Sediment resuspension during construction would be temporary, minimal, and localized, and would be well within suspended sediment tolerance thresholds of larval fish and benthic macroinvertebrates found in estuarine waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures to increased suspended sediment concentrations. Fish and some benthic macroinvertebrates are mobile and generally avoid unsuitable conditions, and may temporarily avoid areas of increased turbidity. Aquatic biota would be expected to return to the project area following construction activities and would not be adversely affected by the temporary increase in suspended sediments.

Installation and removal of the cofferdams and construction of the sheetpile bulkhead at the Owls Head Facility would result in a temporary increase in underwater noise. Elevated noise would be minimized through the use of a vibratory hammer and would be temporary and intermittent. Underwater noise levels associated with physiological injury to fish would not be exceeded by the vibratory hammer, but noise reaching the behavioral threshold (150 dB SPLrms) would occur within 150 to 300 feet of pile driving. Fish would likely avoid ensonified portions of the Canal in the vicinity of sheetpile installation, resulting in a temporary loss of potential foraging habitat within and in the vicinity of pile driving. This temporary habitat loss, when compared with similar habitat that would continue to be available in the vicinity, would not result in a significant adverse impact to aquatic biota.

In-water construction activities at outfall RH-038 would result in a temporary loss of approximately 550 square feet of habitat and associated water column within the cofferdam and turbidity curtain. Construction on this outfall is currently planned to occur on land. The use of a cofferdam and turbidity curtain at outfall OH-007 would result in the temporary loss of 500 square feet of habitat and associated water column. The exclusion of aquatic organisms from the area within the cofferdams would constitute a temporary loss of a minimal area of potential foraging habitat. Because similar habitat would still be available nearby, this temporary loss of a minimal area of habitat would not result in a significant adverse impact to aquatic biota. Fish and benthic organisms would be expected to return to the construction areas when the in-water work is complete and the cofferdams are removed.

TERRESTRIAL RESOURCES

Ecological communities within the study area, in addition to being common throughout the region, are sparsely vegetated, defined by human disturbance, and provide limited habitat value to wildlife in the area. Construction of the Project would result in the removal of up to four street trees at the Head End Site and no street trees at the Owls Head Site. All work would be performed in compliance with Local Law 3 of 2010 and the NYC Parks Tree Protection Protocol. Therefore, construction of the Project would not result in significant adverse impacts to ecological communities.

The study area is limited to previously disturbed City streets and building exteriors that provide habitat to only the most disturbance-tolerant wildlife species. Indirect impacts to wildlife due to construction noise would be minimal as urban-tolerant species are acclimated to the increased noise of urban environments. Any wildlife displaced during construction would be expected to temporarily relocate to similar habitat in the vicinity, and could return following completion of construction activities. Therefore, construction of the Project would not result in significant adverse impacts to wildlife.

M. HAZARDOUS MATERIALS

A detailed assessment of the potential risks related to the construction of the Project with respect to any hazardous materials is described in Chapter 10, “Hazardous Materials.” Properly managed, the deep excavations and dewatering required for construction of the tanks at both Project Sites ultimately would have beneficial effects related to hazardous materials, as these activities would remove contamination from the site. For the Head End Site, this removal would be to a greater extent than would likely occur with only National Grid’s cleanup of the site; NYSDEC does not typically require such deep excavation for cleanup, even if deep contamination is present.

However, without proper controls, construction activities could result in unacceptable exposures to hazardous materials by construction workers, the general public, and/or the environment. To avoid such exposures, the measures summarized below would be incorporated into the Project (final requirements would be specified by the designers and included in the bid documents) to reduce the potential for significant adverse impacts to a greater extent practicable during Project construction.

Demolition of existing above-grade structures would be required. This work, at a minimum, would conform to the following regulatory requirements (additional requirements may be incorporated into the project specifications):

- ~~Prior to any demolition activities with the potential to disturb (aboveground or underground) petroleum storage tanks, these tanks, would be closed and removed, along with any contaminated soil, in accordance with applicable requirements and guidelines including NYSDEC spill reporting and tank registration requirements. If tanks are unexpectedly discovered, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage registrations would be kept updated with the status of the tanks.~~
- Prior to any demolition or excavation activities with the potential to disturb known aboveground or underground petroleum storage tanks, these tanks would be properly closed and removed, along with any contaminated soil, in accordance with applicable requirements and guidelines, including NYSDEC spill reporting and tank registration requirements. If tanks are discovered during construction, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage registrations would be kept updated with the status of the tanks.
- Unless information exists to indicate that suspect ACM do not contain asbestos, prior to any demolition activities an asbestos survey would be completed by a qualified individual/contractor, and all ACM that would be disturbed by the demolition activities would be removed and disposed of in accordance with local, state, and federal regulations and guidelines.
- Any demolition activities with the potential to disturb positively identified or suspected LBP/LCP would be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62—Lead Exposure in Construction).
- Unless labeling or laboratory testing data indicates that suspected PCB-containing fluorescent lighting fixtures, transformers, other electrical equipment, lifts, and elevators do not contain PCBs, and that fluorescent lights do not contain mercury, disposal would be performed in accordance with applicable federal, state, and local regulations and guidelines.
- Disposal of any chemicals would be in accordance with applicable regulations and guidelines.
- ~~Prior to construction, further investigation of the both sites would be performed by DEP to better determine the nature of the surplus soils that would be generated in order to prescribe appropriate procedures (and disposal facilities) for management and handling of these soils during construction, protect the health of the general public and project construction workers, and to reduce the potential for significant adverse impacts. Procedures for this work and for the treatment of any contaminated groundwater removed during dewatering would be subject to NYSDEC and/or USEPA approval.~~
- Investigations of both sites were performed by DEP to better determine the nature of the soils that would be excavated during construction, the water that may require dewatering, and the soil vapor present within the soil. Based on the results of the~~se additional~~ investigations ~~and the other investigations~~ that have ~~already~~ been completed and any additional investigations, if determined to be necessary, site-specific Remedial Action Plans (RAPs) or Soil and Groundwater Management Plans (SGMPs) and Construction Health and Safety Plans (CHASPs) would be prepared for the Head End and the Owls Head Sites. It is anticipated that one or both of USEPA and NYSDEC would be involved in reviewing these plans and determining appropriate measures for both Project Sites.

- Due to known MGP contamination at both Project Sites, the procedures would generally be more stringent than would be typically required at construction sites with no MGP-related contamination. For both the Head End and the Owls Head Sites, the various construction documents would address management of soil and groundwater, including procedures for:
  - **Health and safety measures** to protect workers and the surrounding community. These measures would ensure that all soil disturbance is performed in a manner protective of project construction workers, the general public, and the environment, and would include procedures for odor, dust, and nuisance control, as well as air monitoring requirements.
  - **Soil screening** during excavation. Visual, olfactory, and instrument-based soil screening would be performed under the supervision of a Qualified Environmental Professional during construction that involves subsurface disturbance. Soils will be segregated (based on screening results, existing environmental data, and additional data such as waste characterization data) into material intended for off-site disposal, material intended for re-use as backfill material, and material that requires further sampling and testing to determine its fate.
  - **Construction-related dewatering**. Testing to date indicates that at both Project Sites water collected from dewatering activities would require pre-treatment prior to discharge, particularly given the MGP contamination~~ at both Project Sites~~. At both Project Sites a temporary groundwater treatment system will be designed to treat water generated during construction from excavation dewatering; drainage of excavated materials; contact stormwater runoff; decontamination of construction vehicles, equipment and tools; and other minor sources. Based on available data, influent water could contain a wide range of constituents including: oil and grease, VOCs, SVOCs, pesticides and metals; and NAPL from the former MGP operations could be encountered in the groundwater. Treatment processes would likely include some or~~f~~ all of the following steps: (1) tanks for equalization, sedimentation and removal of free product: metals removal and air stripping using chemical addition for pH adjustment, coagulation and flocculation, and either a settler/clarifier, packaged bag filters, and tray stripper system or a venturi stripping system, sludge tank, and bag filters; (2) granular activated carbon for removal of organic compounds and metals; (3) contingent ion exchange for low level metals removal; (4) sludge dewatering (holding tank, polymer feed system and geotube or filter press); and (5) vapor-phase granular activated carbon or biofilter for air stripper off-gas. Solids generated from treatment will be disposed off-site or regenerated for reuse within the treatment system (e.g., activated carbon). It is anticipated that effluent from the temporary treatment system will be discharged directly to the Canal or the sanitary sewer system. Dewatering will be conducted in accordance with applicable permitting requirements. Treatment limits will be established by NYSDEC, DEP, and/or USEPA.
  - **Odor and dust control/monitoring**. Excavation in MGP contamination areas could result in significant odor concerns (as well as health and safety issues). Odor control procedures might include: limiting the area of open excavations; shrouding excavations with physical barriers (textile covers) or structural enclosures; and/or use (with or without additives) of foams, sprays, or misting systems. Dust control procedures would include: use of water spray (with or without additives) for roads, trucks, excavation areas and stockpiles; use of tarps to cover stockpiles; use of gravel or recycled concrete aggregate (or other suitable materials) to provide a clean and dust-free road surface; use of a truck wash at site access/egress points; and the potential implementation of a sprung structure or similar enclosure surrounding the excavation and equipment to control dust and vapors. In addition, during excavation and loading of any hazardous waste or MGP-contaminated or petroleum-contaminated soil, real-time vapor and fugitive dust particulate (PM_{10}) monitoring would be performed through a CAMP. The CAMP

could include fixed air monitoring and meteorological stations, and action levels and corrective measures to be taken when values indicate responses are necessary. Throughout demolition and construction, erosion and sediment controls would be implemented to comply with the NYSDEC SPDES general permit for Construction Activity. A SWPPP and appropriate best management practices (BMPs) for construction activities involving soil disturbances would be implemented. Additional dust control measures may include: use of stone and gravel pads at entryways; use of mulch and hydro seeding in areas that will remain open or for long-term soil stockpiles; barriers (wind fences) to reduce wind impacts; and administrative controls such as establishing traffic patterns and speeds, establishing unsafe wind speeds and atmospheric conditions, managing and optimizing earth moving steps, and establishing stockpile configuration.

- **Contingency Plan**. Given the unknown origin of the project site's fill material and other uncertainties, the discovery of unknown structures or contaminated media during excavation is possible. Any such findings would be reported to the appropriate regulatory and/or emergency management agencies. Petroleum spills will immediately be reported to the NYSDEC Spill Hotline. Petroleum tanks will be addressed in accordance with applicable Petroleum Bulk Storage (PBS) requirements and guidelines, including those relating to spill reporting and tank registration.
- **Underground tanks** or other sources of contamination encountered during construction activities. Petroleum spills would be reported to the NYSDEC Spill Hotline. Petroleum tanks would be addressed in accordance with applicable NYSDEC requirements, including those relating to spill reporting and tank registration;
- **Import of backfill <u>or clean cover soil</u>** ~~soil~~ from off-site sources. Material from industrial sites, spill sites, environmental remediation sites, or other potentially contaminated sites would not be used. Testing for import of clean soil or fill would be performed in accordance with DER-10 Table 5.4(e) 10 guidance and 6 NYCRR Part 375 Soil Cleanup Objectives (unless regulatory approval has been obtained for alternative requirements).
- **Reuse of on-site materials**. Soil meeting the definition of hazardous waste or containing petroleum, MGP-related contamination, or other types of gross contamination would not be reused, and would be disposed of at a qualified off-site waste disposal facility. Although not anticipated, other soil could potentially be reused in accordance with NYSDEC's requirements for beneficial reuse (6 NYCRR 360-1.15[b][8]) related to *"nonhazardous, contaminated soil which has been excavated as part of a construction project… and which is used as backfill for the same excavation or excavations containing similar contaminants at the same site."* <u>Additionally, soil treated by thermal desorption can be reused, if residual contaminant levels meet the applicable NYSDEC requirements.</u>
- **Off-Site Transportation and Disposal**. Outbound trucks will be inspected and cleaned if necessary before leaving, and all access/egress points for trucks and equipment will be kept clean of site-derived materials. Locations where vehicles exit the site will be inspected daily for evidence of soil tracking off premises. Truck wash facilities will be used as necessary to limit soil tracking onto adjacent streets. Cleaning of the adjacent streets will be performed as needed. Open uncontrolled mechanical processing of historical fill or contaminated soil on-site would not be performed. Loaded vehicles leaving the site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws, regulations, and guidelines. Routes on- and off-site will be routinely monitored for build-up of excessive soils and dust and cleaned as necessary. Material transport to the site will be organized and scheduled to minimize truck queuing. A manifest-based tracking system will be used to document the proper management of material to its final

destination. Trucks will be expected to use DOT-designated truck routes. If material is transported off-site via barges, it would comply with all applicable marine transportation requirements. All material will be managed as regulated material and will be disposed of in accordance with applicable laws, regulations, and guidelines. A documentation/manifest process will be used to document conformance with applicable laws, regulations, and guidelines.

- **Demarcation**. Following any soil contaminant "hot spot" removal, prior to backfilling, the top of the residual soil/fill will be established by placement of a demarcation layer (e.g., a geotextile liner); or by land survey; or material beneath the backfill will be considered contaminated and subject to management as such after the project is complete.
- **Stockpile Methods**. Stockpiles of excavated material will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, as well as before and after every storm event, in order to ensure they are not subject to excessive erosion. Stockpiles of soil exhibiting evidence of contamination will be placed on a layer of impervious material and kept covered with appropriately anchored plastic tarps when not being loaded/unloaded. Stockpiles will be encircled with rigid barriers and/or silt fencing. Stockpiles will be managed appropriately with respect to anticipated end-use. Excavated materials from suspected areas of contamination will be separated from materials intended for re-use. Imported materials will be stockpiled separately. All designated stockpile areas shall be kept free of standing water at all times. Stockpiles will be managed to control stormwater run-off in accordance with applicable laws, regulations, and guidelines. Stockpiles will be located away from the Canal and property boundaries, where possible.
- **Preparation of close-out documentation**. Following completion of all soil disturbance associated with project construction, appropriate Closure Reports (i.e., Remedial Action Reports) would be prepared documenting regulatory compliance, e.g., with respect to off-site soil disposal, imported material, and locations of clean soil caps. For the Head End Site, it is anticipated that NYSDEC will require a Site Management Plan (SMP) to address long-term requirements for managing residual contaminated subsurface material. USEPA might also require an SMP for the Owls Head Site.

With implementation of the measures described above and further detailed in Chapter 10, "Hazardous Materials," construction of the Project would not result in any potential significant adverse effects related to hazardous materials. Following construction, residual contamination would remain at both sites, but construction would have capped the disturbed areas preventing exposure. Any residual contamination would be subject to NYSDEC (and potentially USEPA) controls, through Site Management Plans.

N. WATER AND SEWER INFRASTRUCTURE

As part of the Project, in order to convey flow to and from the facilities, additional improvements to the combined sewer system infrastructure are required. In particular, as discussed in Chapter 1, "Project Description," changes would be made to sewer line routing in the area near the facilities.

In order to divert the flow from the RH-034 outfall to the Head End Facility, modifications would be made to the existing RH-034 regulator structure, including the installation of new bending weirs and replacement of the tide gates. Routing of additional sewer system flows to the Head End Facility, including wet weather flows from adjacent outfalls (RH-033, RH-037, RH-038, and RH-036), would be accomplished by constructing a new sewer on Nevins Street from the intersection with Sackett Street to the intersection with Butler Street. In addition, the associated CSO regulators for these outfalls, located in Nevins Street, would be completely upgraded. Outfalls RH-037 and RH-036, together with outfall RH-034 would remain open and would still be used during high-intensity rainfall events. Outfall RH-033, which is located on the Head End Site, would be closed. The Nevins Street Pumping Station and force main would be eliminated and the outfall pipe for the RH-038 outfall (on Degraw Street, between the intersection with Nevins Street and the Canal) would be replaced.

In order to capture the total design flow rates required for the Owls Head Facility, the existing 2nd Avenue regulator, located just north of the 2nd Avenue and 5th Street intersection, would be replaced with a new 2nd Avenue regulator to direct the flow to the new Facility. Other existing sewer infrastructure, including the existing grit chamber, the outfall (OH-007, located at the end of 2nd Avenue), and the 2nd Avenue Pumping Station located adjacent to the site, would be demolished and removed. A new outfall and a new, similar pumping station with a 1 MGD capacity would be constructed within the Owls Head Facility. In addition, the existing bulkhead at the Owls Head Facility would be replaced. Flow from the Owls Head Facility would be pumped to the Owls Head Interceptor through an existing regulator located at the intersection of 3rd Avenue and 7th Street. A new force main would be constructed to connect the Owls Head Facility to the Owls Head Interceptor for delivery of flow to the Owls Head WWTP once there is sufficient downstream capacity in the sewer system.

All infrastructure work would be performed in accordance with all applicable methods and standards established by DEP and other appropriate regulatory agencies. No disruption to the combined sewer or the existing water supply services is anticipated during construction of the Project.

O. ALTERNATIVE CONSTRUCTION SCHEDULE SCENARIO

As described above, the Project construction schedule assumes that construction activities would typically occur in one 10-hour shift from 7 AM to 5 PM, five days a week on weekdays. However, to make up for weather delays and/or to accelerate the project construction schedule as determined by the construction contractor, there is the potential for some work on weekends. Overall, if regular weekend work is to become necessary, the same or similar impacts would be expected in the areas of vibration, land use and neighborhood character, socioeconomic conditions, community facilities, historic and cultural resources, natural resources, hazardous materials, and water and sewer infrastructure. This scenario may result in impacts that are different from those identified above for the Project in the areas of transportation, air quality, noise, and open space, and are discussed in more detail in this section.

TRANSPORTATION

As discussed above, although weekend construction activities are not anticipated for construction of the Project, weekend work may be needed in order to meet and/or to accelerate the construction schedule. The daily traffic variations were evaluated through a review of the ATR volume data, which included weekends, to determine if weekend background volumes in the area are generally lower than those on weekdays during the 7:00 AM to 8:00 AM and 3:00 PM to 4:00 PM construction peak hours. Based on the collected ATR data, the weekday AM volumes are more than two times the Saturday (the higher traffic volume day of the two weekend days) AM volumes and the weekday PM volumes are approximately six percent higher than the Saturday PM volumes. Therefore, the weekday analysis presented above can be considered a reasonable worst case analysis and any weekend work, if required, would not result in any significant adverse transportation impacts during construction.

AIR QUALITY

The construction air quality analysis presented for the Project construction schedule (i.e., weekday only) above was reviewed to determine if the Alternative Construction Schedule Scenario with weekend work would have the potential to cause potential significant adverse air quality impacts. The air quality modeling analysis performed for the weekday construction schedule reflects the maximum reasonable worst-case air quality concentrations predicted during the period of the most intensive construction activities during the construction duration (SOE installation and site excavation) and that construction during this period would occur in one 10-hour shift from 7 AM to 5 PM, five days a week on weekdays. If weekend work is needed to accelerate the construction schedule, the short-term analysis period (i.e., 1-hour, 8-hour, and 24-hour) results presented for the Project construction schedule would remain the same since the level of construction activities during a weekend workday would be comparable to those for a weekday workday. However, the annual air quality concentrations due to construction would be higher for the Alternative Construction Schedule Scenario since there would potentially be more construction activities over an annual period (seven days per week rather than five days per week). Accordingly, a detailed modeling analysis was conducted to assess the construction air quality effects of the Alternative Construction Schedule Scenario on an annual basis. The selected receptors and analysis period (CP-2), as well as assumptions for construction equipment were the same as those used for the weekday construction schedule.

Maximum predicted annual concentrations during the representative worst-case construction phase (CP-2) due to activities at the Head End Site only, the Owls Head Site only, and both the Head End and Owls Head Sites are presented in **Tables 20-37**. As shown, the maximum predicted total concentrations of NO_2, are below the applicable NAAQS. In addition, the maximum predicted $PM_{2.5}$ concentrations would not exceed the applicable CEQR *de minimis* thresholds. Therefore, construction of the Project under the Alternative Construction Schedule Scenario would also not have the potential to result in significant air quality impacts.

Table 20-37
Maximum Annual Pollutant Concentrations from CP-2 Construction
Alternative Construction Schedule Scenario

Pollutant	Averaging Period	Units	Maximum Modeled Impact	Background Concentration(1)	Total Concentration	Criterion
Construction at Head End Site Only						
NO_2	Annual	μg/m³	4	33	37	100 (2)
$PM_{2.5}$	Annual—Local	μg/m³	0.19	8.7	N/A	0.3 (3)
	Annual—Neighborhood	μg/m³	0.01	8.7	N/A	0.1 (3)
Construction at Owls Head Site Only						
NO_2	Annual	μg/m³	6	33	39	100 (2)
$PM_{2.5}$	Annual—Local	μg/m³	0.296	8.7	N/A	0.3 (3)
	Annual—Neighborhood	μg/m³	0.01	8.7	N/A	0.1 (3)
Construction at Both Heads End and Owls Head Sites						
NO_2	Annual	μg/m³	6	33	39	100 (2)
$PM_{2.5}$	Annual—Local	μg/m³	0.297	8.7	N/A	0.3 (3)
	Annual—Neighborhood	μg/m³	0.01	8.7	N/A	0.1 (3)

Notes:
N/A—Not Applicable
1 The background levels are based on the most representative concentrations monitored at NYSDEC ambient air monitoring stations (see Table 15-3 in Chapter 15, "Air Quality").
2 NAAQS.
3 $PM_{2.5}$ *de minimis* criterion—annual (local and neighborhood scale).

NOISE

The analysis of noise under the Alternative Construction Schedule Scenario used the same methodologies as for the weekday construction schedule except for the consideration of weekend baseline noise levels at the analyzed receptors, which were generally lower than weekday baseline noise levels, and the assumption that construction noise would occur for up to seven days per week rather than five days per week. ~~As with the weekday construction schedule, the CP-2 construction phase was analyzed quantitatively, while the CP-1 and CP-3 construction phases were assessed qualitatively based on the amount of material to be transported to and from the Project Sites under these construction phases as compared to the CP-2 construction phase.~~ The selected receptors and analysis periods, as well as assumptions for construction duration and equipment were the same as those used for the analysis of the weekday-only construction schedule.

EXISTING WEEKEND NOISE LEVELS

Selection of Noise Receptor Locations

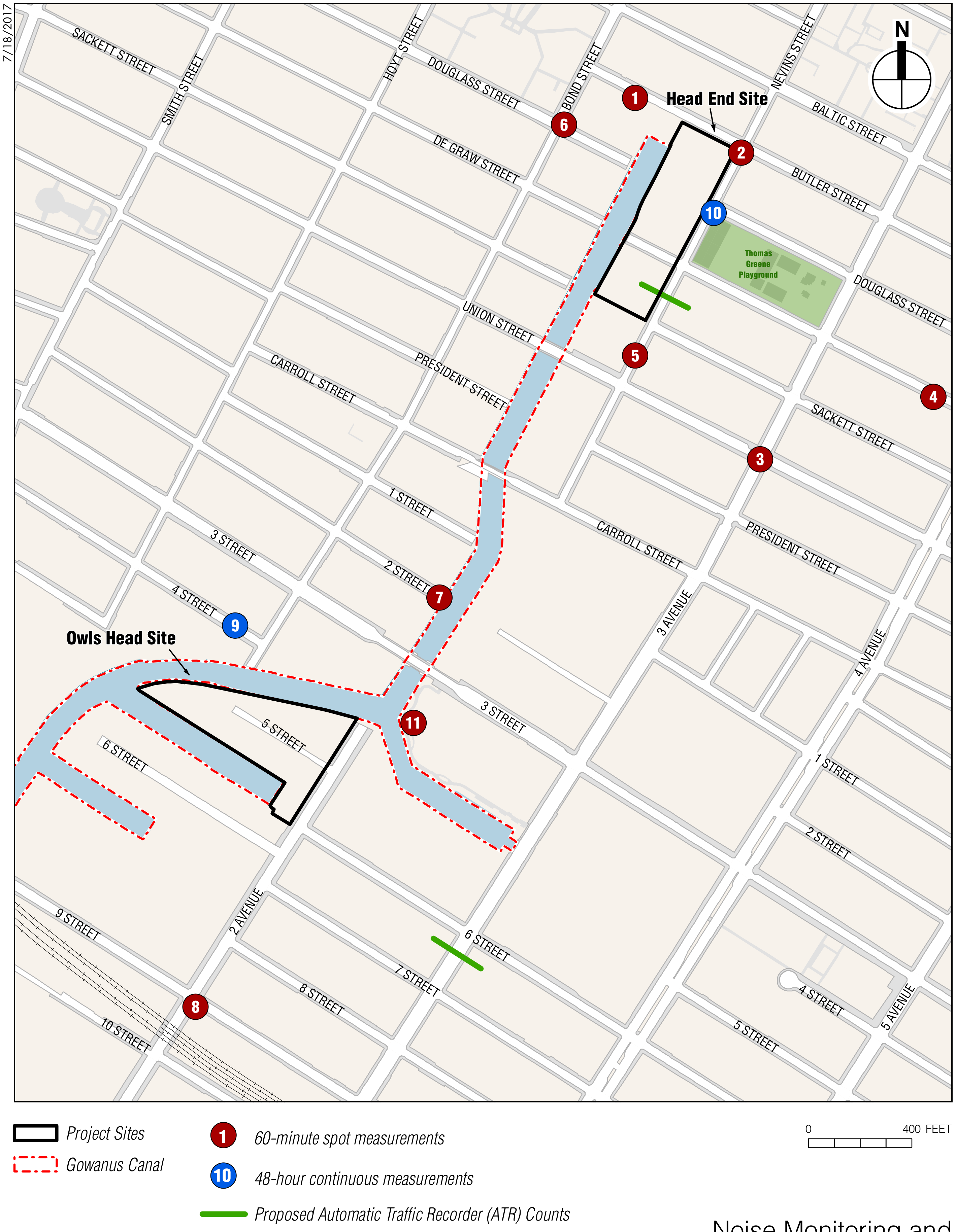
A weekend noise survey was conducted for the same 11 receptor locations surveyed for weekday noise levels (with the exception of receptor 35P representing the Douglass and Degraw pool at which noise level measurements were conducted only on a single representative summer weekday when the pool was in use), which are listed above in **Table 20-33**. The measured noise levels during the weekend were used to evaluate community noise impacts from simultaneous weekend construction activities at the Head End Site and the Owls Head Site. The weekend noise survey program is shown in **Table 20-38** and **Figure 20-22.**

Table 20-38
Noise Measurement Locations

Noise Receptor	Location	Land Use(s) Represented	Type of Measurements
Spot (60-minutes) Noise Monitoring			
1	Butler Street between Nevins Street and Bond Street	Residential	60-minute spot measurement
2	Northeast corner of Nevins Street and Butler Street	Residential	60-minute spot measurement
3	Southwest corner of 3rd Avenue and Union Street	Residential	60-minute spot measurement
4	Degraw Street between 3rd Avenue and 4th Avenue	Residential/Hotel	60-minute spot measurement
5	Nevins Street between Sackett Street and Union Street	Residential	60-minute spot measurement
6	Northeast Corner of Douglass Street and Bond Street	Residential	60-minute spot measurement
7	Gowanus Waterfront Park at 2nd street and the Gowanus Canal West Bank.	Open Space/Recreation/ Residential	60-minute spot measurement
8	Southeast Corner of 2nd Avenue and 9th Street	Residential	60-minute spot measurement
11	Southwest corner of Whole Foods Market Outdoor Space	Open Space/Recreation	60-minute spot measurement
Continuous 48-Hour Noise Monitoring			
9	4th Street between Bond Street and Hoyt Street	Residential	48-hour continuous measurement
10	Nevins Street between Douglass Street and Degraw Street	Open Space/Recreation	48-hour continuous measurement

Noise Monitoring Results

Continuous 48-hour weekend noise measurements were performed at site 10 on July 8, 2017 to July 10, 2017 and at site 9 on July 15, 2017, to July 17, 2017. Concurrently, spot noise level measurements were conducted for 60-minutes at sites 1, 2, 3, 4, 5, 6, 7, 8, and 11.



Noise Monitoring and ATR Locations for Weekend Data Collection

Gowanus Canal CSO Facilities

Figure 20-22

Existing Noise Levels At Noise Measurement Locations

The measured existing weekend $L_{eq(1)}$ and $L_{10(1)}$ noise levels at each measurement location are summarized in **Table 20-39**. At Sites 1 through 6, the 48-hour existing noise levels were calculated by prorating spot-measured noise levels based on the temporal distribution of measured noise levels at Site 10. At Sites 7, 8, and 11, 48-hour existing noise levels were calculated by prorating spot-measured noise levels based on the temporal distribution of measured noise levels at Site 9. Specifically, for each spot measurement location, the difference in measured L_{eq} values at the spot measurement location versus the continuous measurement location at the same hour was applied to noise levels measured at the continuous measurement location for each hour to develop a 48-hour profile of noise levels. The minimum measured noise levels occurred during the 3 AM hour at Sites 10 and 11. Full measurement results are provided in **Appendix 20-2**.

Table 20-39
Existing Noise Levels in dBA

Receptor Site	Location	Measurement Start Time	Measured Noise Levels in dBA[1]		Minimum Existing Noise level in dBA (during construction hours 7:00 AM to 5:00 PM)[2]	
			L_{eq}	L_{10}	L_{eq}	L_{10}
1	Butler Street between Nevins Street and Bond Street	1:00 PM	60.1	61.4	53.9	55.9
2	Northeast corner of Nevins Street and Butler Street	2:00 PM	63.5	63.6	55.3	56.8
3	Southwest corner of 3rd Avenue and Union Street	5:00 PM	68.5	68.8	56.6	57.3
4	Degraw Street between 3rd Avenue and 4th Avenue	6:00 PM	65.7	65.9	54.0	53.7
5	Nevins Street between Sackett Street and Union Street	4:00 PM	60.8	63.8	54.6	56.9
6	Northeast Corner of Douglass Street and Bond Street	12:00 PM	59.6	62.1	53.7	56.3
7	Gowanus Waterfront Park at 2nd street and the Gowanus Canal West Bank.	6:00 PM	60.3	60.3	58.9	61.8
8	Southeast Corner of 2nd Avenue and 9th Street	4:00 PM	68.9	72.1	63.9	69.5
9	4th Street between Bond Street and Hoyt Street	Each hour	61.6 to 68.0	57.4 to 66.7	61.6[3]	62.7
10	Nevins Street between Douglass Street and Degraw Street	Each hour	51.7 to 68.4	50.7 to 71.2	56.6[3]	59.0
11	Southwest corner of Whole Food Market Outdoor Space	12:00 PM	55.2	57.8	54.3	57.2

Notes:
[1] Noise Level measurements were conducted by AKRF, Inc. on July 7, 2017, July 8, 2017, July 15, 2017, and July 16, 2017, and are representative of weekend conditions.
[2] Minimum $L_{eq(1)}$ and $L_{10(1)}$ noise levels are based on prorating measured $L_{eq(1)}$ and $L_{10(1)}$ based on 48-hour noise level profile at representative 48-hour continuous noise measurement locations.
[3] Minimum measured or prorated $L_{eq(1)}$ and $L_{10(1)}$ noise levels (during construction hours) are presented. Using the minimum measured noise levels as a basis of comparison is conservative since minimum baseline noise levels would tend to result in maximum projected noise level increments resulting from construction. Full 48-hour measurement results are presented in Appendix 20-2.

At all receptor sites, vehicle traffic on adjacent or nearby roadways was the dominant noise source. Measured levels at all sites were moderate and reflected the levels expected from weekend vehicular traffic on adjacent roadways. Rail noise from the NYCT F and G elevated subway lines also contributed to measured noise levels at Sites 8 and 9. In terms of the CEQR criteria as defined in Table 17-2 in Chapter 17 "Noise," the minimum existing noise levels at Receptors 1, 2, 3, 4, 5, 6, 7, and 9 are in the "acceptable" category for residences and hotels, the minimum existing noise levels at Receptor 8 are in the "marginally acceptable" category for residences and hotels.

Minimum existing noise levels at Receptors 10 and 11 are above the "acceptable" noise exposure guideline criteria for open spaces requiring serenity and quiet.

PROBABLE IMPACTS OF THE PROJECT

Weekend Construction Noise Analysis Results

Noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during the worst-case noise analysis periods from on-site construction equipment and construction-related vehicles.

Table 20-40 summarizes the minimum and maximum predicted noise impacts at each receptor site as a result of construction during the entire 48-month CP-2 construction phase under the Alternative Construction Schedule Scenario. Full construction noise analysis results for each of the worst-case analysis periods are provided in **Appendix 20-2**.

Table 20-40
Construction Noise Analysis Results in dBA

Receptor Site	Existing L_{eq} in dBA		Total L_{eq} in dBA CP1		CP2		CP3		Change in L_{eq} in dBA CP1		CP2		CP3	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	53.9	57.0	57.1	57.1	57.2	57.3	58.2	58.2	0.3	0.3	0.2	0.7	2.2	2.2
2	55.3	67.1	68.5	68.5	68.8	71.3	71.5	71.5	8.2	8.2	1.7	14.1	14.4	14.4
3	56.6	69.4	69.5	69.5	69.6	70.0	69.8	69.8	2.1	2.1	0.2	6.1	4.5	4.5
4	54.0	62.0	62.0	62.0	62.0	62.1	62.1	62.1	0.2	0.2	0.0	0.7	0.4	0.4
5	54.6	60.1	63.0	63.0	63.6	68.4	65.8	65.8	6.3	6.3	3.5	13.3	10.3	10.3
6	53.7	71.7	71.7	71.7	71.7	71.8	71.7	71.7	0.4	0.4	0.0	3.4	0.7	0.7
7	58.9	52.0	52.7	52.7	53.0	54.6	53.2	53.2	0.2	0.2	0.2	2.6	0.3	0.3
8	63.9	73.8	73.9	73.9	74.0	74.4	74.1	74.1	1.0	1.0	0.2	3.8	2.6	2.6
9	61.6	61.5	61.5	61.5	61.5	61.6	61.5	61.5	0.0	0.0	0.0	0.1	0.0	0.0
10	56.6	61.2	64.9	64.9	65.0	69.8	68.1	68.1	6.9	6.9	3.8	12.8	10.9	10.9
11	54.3	55.0	56.1	56.1	55.8	59.4	55.8	55.8	1.2	1.2	0.8	4.8	0.9	0.9
12	48.0	54.2	52.0	54.4	52.0	55.0	52.1	54.5	0.1	0.2	0.0	0.8	0.1	0.3
13	53.0	54.4	52.1	54.4	52.0	54.5	52.1	54.4	0.0	0.2	0.0	0.9	0.0	0.4
14	48.0	54.9	52.1	54.9	52.0	55.2	52.1	55.0	0.0	0.5	0.0	1.1	0.1	0.7
15	55.1	55.2	54.6	55.4	54.5	57.1	54.6	55.6	0.0	1.2	0.0	3.5	0.0	1.3
16	48.0	57.9	52.1	58.1	52.1	59.0	52.1	58.2	0.2	1.6	0.0	6.0	0.4	2.5
17	48.0	62.5	52.0	62.6	52.0	63.0	52.1	62.6	0.1	4.8	0.0	10.1	0.2	6.1
18	48.0	52.0	52.1	52.1	52.0	52.3	52.1	52.1	0.0	0.2	0.0	0.4	0.0	0.3
19	48.0	55.9	52.1	56.0	52.0	56.1	52.1	56.0	0.1	0.3	0.0	0.9	0.1	0.4
20	48.0	55.0	52.3	56.0	52.5	56.4	52.5	56.7	0.1	4.5	0.0	6.7	0.3	3.9
21	48.0	53.2	52.1	55.3	52.1	57.2	52.1	56.3	0.1	4.9	0.1	8.3	0.4	6.0
22	48.0	63.1	52.1	63.2	52.1	64.8	52.1	63.4	0.1	7.4	0.0	14.2	0.3	9.3
23	48.0	66.8	62.3	66.8	62.2	67.4	62.3	66.9	0.2	7.2	0.0	12.6	0.5	8.7
24	48.0	66.1	62.5	66.1	62.6	66.3	62.6	66.1	0.8	3.1	0.0	10.6	0.9	4.1
25	48.0	65.2	63.7	65.2	63.6	65.6	63.7	65.3	1.5	3.8	0.0	10.1	1.4	5.7
26	48.0	63.4	57.4	63.8	57.4	64.4	57.5	63.8	0.3	6.0	0.0	9.2	0.5	6.2
27	51.4	52.0	52.0	53.5	52.0	55.9	52.1	54.7	0.0	0.4	0.0	3.9	0.0	0.7
28	48.0	52.3	52.0	54.1	52.0	58.7	52.1	54.8	0.0	3.7	0.0	9.6	0.0	4.4
29	58.0	52.0	52.1	52.2	52.0	52.9	52.1	52.4	0.0	0.0	0.0	0.9	0.0	0.1
30	48.0	54.7	52.1	58.8	52.2	63.3	52.4	60.8	0.3	7.2	0.2	12.3	1.0	9.5
31	48.0	54.0	52.4	56.4	52.2	60.9	52.5	57.1	0.2	7.4	0.2	12.5	1.2	6.5
32	50.2	69.7	56.7	69.8	56.7	70.2	57.0	70.0	0.4	1.3	0.2	4.4	1.0	3.0
33	48.0	56.5	52.1	57.6	52.1	62.5	52.2	60.1	0.2	6.2	0.1	14.2	0.5	10.1

Table 20-40 (cont'd)
Construction Noise Analysis Results in dBA

Receptor Site	Existing L_{eq} in dBA		Total L_{eq} in dBA						Change in L_{eq} in dBA					
			CP1		CP2		CP3		CP1		CP2		CP3	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
34	48.0	58.5	52.2	60.0	52.3	63.1	52.6	61.6	0.4	8.4	0.3	14.0	1.3	11.4
35	49.8	66.1	56.7	66.3	57.5	68.9	57.4	68.9	0.2	9.1	0.2	14.9	0.5	14.9
35P	66.1	66.1	66.3	66.3	66.4	67.2	66.9	66.9	0.2	0.2	0.2	1.1	0.8	0.8
36	48.0	55.2	59.2	63.4	56.6	71.2	60.0	65.3	10.7	13.8	4.2	22.1	11.5	15.7
37	48.0	55.0	52.4	66.3	52.2	71.8	52.7	65.8	0.9	18.2	0.2	23.8	1.6	17.7
38	48.0	59.0	52.2	59.0	52.1	59.3	52.3	59.1	0.4	6.6	0.1	9.8	0.8	7.1
39	53.3	56.5	54.0	57.6	54.2	61.7	54.2	57.2	0.7	1.4	0.7	6.1	0.8	0.9
40	48.0	65.7	52.1	65.9	52.2	66.7	52.4	66.3	0.3	4.4	0.2	10.0	0.9	6.4
41	48.0	58.8	52.0	58.4	52.0	58.6	52.1	58.5	0.1	0.5	0.0	2.1	0.2	1.2
42	48.0	58.2	52.5	60.3	52.8	60.6	53.3	60.4	0.3	4.4	0.0	8.7	0.7	6.3
43	48.0	64.3	60.3	64.5	60.3	65.5	60.4	65.0	1.5	4.1	0.1	8.8	3.1	6.7
44	48.0	65.7	56.7	65.8	56.8	66.5	57.3	66.2	1.6	4.5	0.3	10.1	4.1	8.2
45	49.2	71.8	53.6	71.8	53.6	71.8	53.9	71.8	0.0	0.8	0.0	1.8	0.2	1.4
46	52.6	71.9	56.9	71.9	56.9	72.1	57.0	72.0	0.0	0.5	0.0	2.0	0.2	1.3
47	53.2	72.4	69.9	72.5	69.9	72.7	70.0	72.6	0.6	0.8	0.1	3.1	1.6	2.1
48	48.0	70.9	52.1	61.2	52.0	61.2	52.2	61.2	0.0	1.4	0.0	3.1	0.1	2.0
49	48.0	59.3	52.1	60.4	52.1	63.1	52.3	62.2	0.2	6.7	0.1	12.9	0.8	11.8
50	48.0	60.2	52.5	66.3	52.6	72.1	53.7	73.3	0.7	17.3	0.1	23.9	2.1	25.1
51	48.0	54.2	53.9	54.4	54.0	54.6	55.7	56.9	0.2	0.4	0.2	1.1	2.8	4.8
52	48.9	57.5	52.6	58.8	52.4	61.2	52.7	60.6	0.4	5.5	0.0	10.0	0.8	8.2
53	48.0	57.2	53.8	58.3	54.8	57.8	54.2	57.7	0.1	3.7	0.0	8.3	0.1	4.3
54	48.0	58.8	55.8	58.8	55.8	58.9	55.8	58.8	0.0	0.1	0.0	0.2	0.0	0.1
55	48.0	65.6	53.1	65.6	52.2	67.6	52.5	65.6	0.0	13.0	0.0	17.8	0.0	7.1
56	48.0	52.0	52.9	55.0	52.7	61.5	53.1	55.7	1.9	5.4	0.7	13.2	2.3	6.3
57	48.0	59.6	54.5	66.4	54.6	73.3	55.2	73.1	1.0	18.0	0.4	25.2	2.7	25.0
58	48.0	67.6	53.5	67.7	53.6	70.6	53.7	67.8	1.0	15.7	0.0	22.5	1.4	15.8
59	48.0	66.2	52.5	67.8	52.6	76.2	53.5	75.6	1.2	11.3	0.6	20.1	3.1	19.5
60	48.0	55.6	55.0	59.6	54.6	65.1	55.0	57.9	0.1	11.1	0.0	17.0	0.1	9.2
61	48.0	56.3	61.0	61.0	59.3	64.9	60.4	60.4	11.5	11.5	3.0	16.4	10.6	10.6
62	48.0	52.0	58.7	58.7	55.2	61.9	53.8	53.8	10.1	10.1	3.2	13.6	3.7	3.7
Note: * This table has been updated for the FEIS.														

Construction of the Project is predicted to result in noise level increases at residences near both Project Sites during some portions of ~~the CP-2~~ construction ~~phase~~. Generally, the noise level increases resulting from construction would occur at buildings in the immediate vicinity of construction activity.

The maximum predicted noise levels shown in **Table 20-40** would occur during the most noise-intensive activities of construction such as SOE and site excavation, which would not occur every day during the construction period, and do not occur during every hour on days when those activities are underway. During hours when the loudest pieces of construction equipment are not in use, receptors would experience lower construction noise levels. As described below, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction.

Receptor 36—Residential Receptor on Nevins Street across from the Head End Site Staging Area

At the existing residential receptor located at 285 Nevins Street across from the Head End Site staging area—Receptor 36—existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the mid-50s to low 70s dBA, resulting in noise level increases of up to approximately 22 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of dump trucks and excavators operating during the site excavation portion of CP-2 construction at the Head End Site, with a duration of approximately 10 months. The predicted noise level increases at this residence would be noticeable and potentially intrusive and the total noise levels would be in the "marginally unacceptable" range based on *CEQR Technical Manual* noise exposure criteria. Noise levels during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) would range from the low 50s to the low 60s dBA, resulting in noise level increases of up to approximately 12 dBA. Based on the high magnitude and long duration of these noise level increases, construction of the Project under the Alternative Construction Schedule Scenario would have the potential to result in a temporary significant adverse impact at the existing residential receptor at 285 Nevins Street located across Nevins Street from the Head End Site staging area (i.e., Receptor 36). Standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be in the high 40s dBA, up to approximately 4 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in elevated noise levels at the residential receptor at 285 Nevins Street across from the Head End Site staging area comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 would be expected to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 14 dBA (i.e., 8 dBA less than the 22 dBA maximum increment during the loudest period of CP2)~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 15 dBA (i.e., 7 dBA less than the 22 dBA maximum increment during the loudest period of CP2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be up to approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While construction associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in lower noise levels at 285 Nevins Street located across from the Head End Site staging area (i.e., Receptor 36) than those predicted for CP-2, construction ~~associated with CP-1 and CP-3 may~~of the Project would result in ~~exceedances of *CEQR Technical Manual* noise impact criteria and the~~ a potential temporary significant adverse impact ~~predicted~~ at this receptor during CP-2~~ may occur during some or all of the construction associated with CP-1 and CP-3 as well~~.

Construction of the Project under the Alternative Schedule Scenario (i.e., CP-1, CP-2 and CP-3) will result in exceedances of *CEQR Technical Manual* noise impact criteria and will result in a potential temporary significant adverse impact predicted at the existing residential receptor at 285 Nevins Street located across Nevins Street from the Head End Site staging area (i.e., Receptor 36).

Receptor 37—Residential Receptor Immediately Adjacent to Head End Site Staging Area

At the residential receptor located at 282 Nevins Street immediately adjacent to the Head End Site Staging Area—Receptor 37—existing noise levels are in the mid 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low~~ high 40s to low 70s dBA, resulting in noise level increases of up to approximately 24 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of dump trucks and excavator operation during the site excavation portion of CP-2 construction at the Head End Site, with a duration of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the “marginally unacceptable” range based on *CEQR Technical Manual* noise exposure criteria. Based on the high magnitude and long duration of these noise level increases, construction of the Project under the Alternative Construction Schedule Scenario would have the potential to result in a potential temporary significant adverse impact at the existing residential receptor at 282 Nevins Street located adjacent to the Head End Site staging area (i.e., Receptor 37). Standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be in the high 40s dBA, up to approximately 5 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor at 282 Nevins Street adjacent to the Head End Site staging area comparable to or less than those for CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 would be expected to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 18 dBA (i.e., 6 dBA less than the 24 dBA maximum increment during the loudest period of CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s, resulting in a noise level increase above ambient conditions up to approximately 18 dBA (i.e., 6 dBA less than the 24 dBA maximum increment during the loudest period of CP2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While construction associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in lower noise levels at 282 Nevins Street located across from the Head End Site staging area (i.e., Receptor 37) than those predicted for CP-2, construction ~~associated with CP-1 and CP-3 may~~of the Project would result in a ~~exceedances of *CEQR Technical Manual* noise impact criteria and the~~ potential temporary significant adverse impact ~~predicted~~ at this receptor during CP-2~~ may occur during some or all of the construction associated with CP-1 and CP-3 as well~~.

Construction of the Project under the Alternative Schedule Scenario (i.e., CP-1, CP-2 and CP-3) will result in exceedances of *CEQR Technical Manual* noise impact criteria and will result in a potential temporary significant adverse impact predicted at the existing residential receptor at 282 Nevins Street located across from the Head End Site staging area (i.e., Receptor 37).

Receptor 50—Future Hotel Receptor across Butler Street from the Head End Site

At the future hotel receptor located at 255 Butler Street across Butler Street from the Head End Site—Receptor 50—existing noise levels are in the high 40s to low 60s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low~~ high 40s to low 70s dBA, resulting in noise level increases of up to approximately 24 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of excavators, dozers, and loaders operating at the Head End Site during the excavation portion of CP-2 construction over the course of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the "marginally unacceptable" range based on *CEQR Technical Manual* noise exposure criteria. The building's façade is currently undergoing renovations, and the completed façade construction is expected to include insulated glass windows along with an alternate means of ventilation allowing for the maintenance of a closed-window condition. The completed building façade, with these measures, would be expected to provide approximately 30 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be below the 45 dBA threshold recommended for hotel guestroom use according to the *CEQR Technical Manual* noise exposure guidelines. Therefore construction during CP-2 would not be expected to result in a significant adverse impact at the future hotel receptor located at 255 Butler Street across Butler Street from the Head End Site (i.e., Receptor 50).

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in elevated noise levels at the future hotel receptor at 255 Butler Street across Butler Street from the Head End Site comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above,~~ ~~s~~Stationary equipment and truck volumes associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions of up to approximately 17 dBA, (i.e., 7 dBA less than the 24 dBA maximum increment during the loudest period of CP-2) ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Construction during ~~Similarly,~~ CP-3 ~~would be expected~~is predicted to result in ~~lower construction~~ noise levels in the mid-70s dBA, resulting in noise level increases above ambient conditions up to approximately 25 dBA (i.e., comparable to the 24 dBA maximum increment during the loudest period of CP-2). Maximum construction noise levels during CP-3 would occur during in-street sewer work along Butler Street and Nevins Street, which would have a duration of up to approximately 4 months. As described above, the completed building façade would be expected to provide approximately 30 dBA window/wall attenuation, which would result in interior noise levels during the loudest portions of CP-3 below the 45 dBA threshold recommended for hotel guestroom use according to the *CEQR Technical Manual* noise exposure guidelines, and therefore would not rise to the level of significant adverse impact. Construction during the remaining 20 months of CP-3 would produce noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions of up to approximately 17 dBA (i.e., 7 dBA less than the 24 dBA maximum increment during the loudest period of CP-2). While noise level increases during CP-1 and the 20 months of CP-3 without in-street sewer work would be noticeable, total noise levels would be in the "acceptable" range based on *CEQR Technical Manual* noise exposure criteria, and therefore would not rise to the level of significant adverse impact. Construction noise levels during the majority of CP-1 and CP-3 (i.e., excluding up to 4 months of in-street sewer work) would be less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic.

Since construction noise levels during the loudest portions of CP-3 would remain below the recommended threshold for hotel guestroom use and total noise levels during CP-1 and the remainder of

CP-3 would remain in the "acceptable" range, noise levels during CP-1 and CP-3 would not rise to the level of significant adverse impact at 255 Butler Street across Butler Street from the Head End Site (i.e., Receptor 50).

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels inside the building would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at 255 Butler Street across Butler Street from the Head End Site (i.e., Receptor 50).

Receptors 57 and 59—Potential Conservative Analysis Receptors across Nevins Street from Head End Site

At the potential conservative analysis receptors located across Nevins Street from the Head End Site—Receptors 57 and 59—existing noise levels are in the high 40s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the high 40s to mid-70s dBA, resulting in noise level increases of up to approximately 25 dBA. The maximum construction noise levels predicted at these receptors would be produced as a result of clamshell excavators, cranes and dump trucks during SOE construction at the Head End Site, with a duration of up to approximately 13 months, dump trucks, loaders, excavators, and dozers during site excavation activities at the Head End Site, with a duration of approximately 10 months, and concrete trucks, concrete pumps and tractor trailers making deliveries to the Head End Site with a duration of approximately 24 months during sub-surface construction activities. These activities would occur over the course of the entire 48 months of CP-2 construction. However, notwithstanding the high magnitude and long duration of these noise level increases, the predicted levels of noise resulting from construction of the Project under the Alternative Construction Schedule Scenario would not result in a potential significant adverse impact at the potential conservative analysis receptors located across Nevins Street from the Head End Site (i.e., Receptors 57, and 59), because these receptors only represent the Project's effect on potential future land use changes and do not currently exist. If these locations allow for noise-sensitive uses in the future, noise exposure from construction of the Project and potential measures to mitigate such noise would be considered in a future environmental review.

If noise-sensitive uses were developed on these locations in the future, standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at these residential receptors during construction would be in the low 50s dBA, up to approximately 9 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ potential conservative analysis receptors across Nevins Street from the Head End Site comparable to or less than those for CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 would be expected to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in a noise level increase above ambient conditions of up to approximately 18 dBA (i.e., 7 dBA less than the 25 dBA maximum increment during the loudest period of~~than~~ CP-2). ~~because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly,~~ Construction during CP-3 ~~would be expected~~ is predicted to result in

~~lower construction noise levels~~ noise levels up to the mid-70s dBA, resulting in noise level increases above ambient conditions of up to approximately 25 dBA (i.e., comparable to the 25 dBA maximum increment during the loudest period of ~~than~~ CP-2). The maximum construction noise levels predicted at these receptors associated with CP-3 would occur during in-street sewer work along Nevins Street, which would occur for up to approximately 4 months. Noise levels during the remaining 20 months of CP-3 when construction is not occurring on Nevins Street directly in front of these receptors, construction would be up to the high 60s dBA, resulting in noise level increases above ambient conditions of up to approximately 16 dBA (i.e., 9 dBA less than the 25 dBA maximum increment during the loudest period of CP-2). While construction noise levels during the loudest activities during CP-3 (i.e., in-street sewer work) would be comparable to the maximum noise levels during CP-2, noise levels during all of CP-1 and the majority of CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While construction associated with CP-1 and CP-3 ~~would be expected to~~ would result in ~~lower noise levels~~ exceedances of *CEQR Technical Manual* noise impact criteria at the potential conservative analysis receptors across Nevins Street from the Head End Site (i.e., Receptors 57 and 59), ~~than those predicted for CP-2, construction associated with CP-1 and CP-3 may result in exceedances of *CEQR Technical Manual* noise impact criteria. However,~~ because these receptors only represent the Project's effect on potential future land use changes and currently do not exist, construction associated with CP-1 and CP-3 and therefore the Project as a whole would not result in a significant adverse impact at these receptors under the Alternative Construction Schedule Scenario.

Construction of the Project under the Alternative Construction Schedule Scenario (i.e., CP-1, CP-2 and CP-3) does not have the potential to result in a potential temporary significant adverse impact at the potential conservative analysis receptors across Nevins Street from the Head End Site (i.e., Receptors 57 and 59) because these receptors only represent the Project's effect on potential future land use changes and currently do not exist.

Receptor 58—Potential Conservative Analysis Receptor across Gowanus Canal from Head End Site
At the potential conservative analysis receptor located across the Gowanus Canal from the Head End Site—Receptor 58—existing noise levels are in the high 40s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the high 40s to low 70s dBA, resulting in noise level increases of up to approximately 23 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of clamshell excavators, cranes and dump trucks during SOE construction at the Head End Site, with a duration of up to approximately 13 months, dump trucks, loaders, excavators, and dozers during site excavation activities at the Head End Site, with a duration of approximately 10 months, and concrete trucks, concrete pumps and tractor trailers making deliveries to the Head End Site with a duration of approximately 24 months during sub-surface construction activities. These activities would occur over the course of the entire 48 months of CP-2 construction. However, notwithstanding the high magnitude and long duration of these noise level increases, the predicted levels of noise resulting from construction of the Project under the Alternative Construction Schedule Scenario would not result in a potential significant adverse impact at the potential conservative analysis receptor located across the Canal from the Head End Site (i.e., Receptor 58), because this receptor only represents the Project's effect on potential future land use changes and does not currently exist. If this location allows for noise-sensitive uses in the future, noise exposure from construction of the Project and potential measures to mitigate such noise would be considered in a future environmental review.

If noise-sensitive uses were developed at this location in the future, standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, maximum interior noise levels at this residential receptor during construction would be in the high 40s dBA, up to approximately 4 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ potential conservative analysis receptor located across the Gowanus Canal from the Head End Site comparable to or less than those for CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 16 dBA (i.e., 7 dBA less than the 23 dBA maximum increment during the loudest period of ~~than~~ CP-2). ~~because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 60s dBA, resulting in a noise level increase above ambient conditions up to approximately 16 dBA (i.e., 7 dBA less than the 23 dBA maximum increment during the loudest period of ~~than~~ CP-2). Construction noise levels during the loudest activities of CP-1 and CP-3 would be less than the maximum noise levels during CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20~~5~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While noise level increases during ~~construction associated with~~ CP-1 and CP-3 would be noticeable, total noise levels would remain in the “acceptable” range based on *CEQR Technical Manual* noise exposure criteria and would therefore not rise to the level of significant adverse impact. While construction associated with CP-1 and CP-3 is predicted ~~expected~~ to result in lower noise levels at the potential conservative analysis receptor located across the Gowanus Canal from the Head End Site (i.e., Receptor 58) than those predicted for CP-2, construction associated with CP-1 and CP-3 ~~may~~ would result in exceedances of *CEQR Technical Manual* noise impact criteria. However, because this receptor only represents the Project’s effect on potential future land use changes and currently does not exist, construction associated with CP-1 and CP-3 and therefore the Project as a whole would not result in a significant adverse impact at this receptor under the Alternative Construction Schedule Scenario.

Construction of the Project under the Alternative Construction Schedule Scenario (i.e., CP-1, CP-2 and CP-3) does not have the potential to result in a potential temporary significant adverse impact at the potential conservative analysis receptors across the Gowanus Canal from the Head End Site (i.e., Receptor 58) because this receptor only represents the Project’s effect on potential future land use changes and currently do not exist.

Receptors 22 and 23—Residential Receptor at the intersection of Bond Street and Douglass Street with Line of Sight to the Head End Site

At the existing residential receptors located at the intersection of Bond Street and Douglass Street with line of sight to the Head End Site, with addresses of 229 Hoyt Street (NYCHA Gowanus Houses) and 245 Bond Street—Receptors 22 and 23—existing noise levels are in the low 50s to mid-60s dBA on weekdays and the high 40s dBA on weekends.

Construction during CP-2 is predicted to produce maximum noise levels at this receptor in the high 40s to mid-60s dBA. The maximum construction noise levels predicted at these ~~this~~ receptors would be produced as a result of peak truck operation during the site excavation portion of CP-2 construction at the Head End Site, over the course of approximately 10 months. Noise levels during the remaining 38 months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) would be in the mid 50s dBA.

On weekdays at these receptors, construction of the Project would result in noise level increases up to approximately 3 dBA, which would be considered “just noticeable” and would not exceed *CEQR Technical Manual* impact criteria.

On weekend days at these receptors, construction of the Project would result in noise level increases up to approximately 14 dBA during the 10 months of peak truck operation under CP-2, and up to approximately 10 dBA during the remaining 38 months of CP-2. While such increases would be noticeable and potentially intrusive, the total predicted noise levels would be in the “clearly acceptable” to “marginally acceptable” range based on *CEQR Technical Manual* noise exposure criteria. Furthermore, the total noise levels with construction of the Project on weekend days would be in the mid 60s dBA, which would be comparable to existing condition noise levels at these receptors during week days. Additionally, construction of the Project would not occur during nighttime hours when residences are typically most sensitive to noise, and consequently would not generate noise during that time.

Therefore, construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of significant adverse impact at the existing residential receptors located at 229 Hoyt Street (NYCHA Gowanus Houses) on the northeast corner of Bond Street and Douglass Street and 245 Bond Street (i.e., Receptors 22 and 23).

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor at 229 Hoyt Street (NYCHA Gowanus Houses) on the northeast corner of Bond Street and Douglass Street and 245 Bond Street comparable to or less than those for CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid-60s dBA, resulting in noise level increases above ambient conditions of up to approximately 7 dBA (i.e., 7 dBA less than the 14 dBA maximum increment during CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity during CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels in the mid 60s dBA, resulting in noise level increases up to 9 dBA above the ambient condition (i.e., 5 dBA less than the 14 dBA maximum increment during CP-2). Construction noise levels during the loudest activities of CP-1 and CP-3 would be less than the maximum noise levels during ~~than~~ CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Consequently, while such increases in noise levels throughout construction associated with CP-1 and CP-3 would be noticeable and potentially intrusive, the total noise levels would ~~also~~ be in the “clearly acceptable” to “marginally acceptable” range on weekends and in the “marginally unacceptable” range on weekdays according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise level increases predicted to occur at these receptors would have a relatively short duration and weekend noise levels would remain in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria for the majority of the construction period, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at 229 Hoyt Street (NYCHA Gowanus Houses) on the northeast corner of Bond Street and Douglass Street and 245 Bond Street (i.e., Receptors 22 and 23).

Receptor 35—Thomas Greene Playground across Nevins Street

At the Thomas Greene Playground—Receptor 35—existing ambient noise levels are in the high 40s ~~to mid-50s~~ to mid-60s dBA, and existing condition noise levels at the Douglass and Degraw pool (i.e., Receptor 35P) are in the mid 60s dBA when the pool is in use, due to noise generated by use of the pool. Construction during CP-2 is predicted to produce noise levels throughout most of the Playground (i.e., the portion of the Playground other than the handball courts along Nevins Street) in the low to high 50s dBA, resulting in noise level increases of up to approximately 10 dBA during the most noise-intensive periods of construction. At the handball courts at the westernmost portion of the Playground, which are directly across Nevins Street from the Head End Site, construction of CP-2 is predicted to result in noise levels up to the high 60s dBA, resulting in noise level increases of up to approximately 15 dBA. At the Douglass and Degraw Pool, construction of CP-2 is predicted to result in noise levels in the low 60s dBA.

The predicted noise level increases at these open space locations would be noticeable, and would exceed the *CEQR Technical Manual* impact criteria, and the total noise levels would exceed the 55 dBA L_{10} noise level recommended by the *CEQR Technical Manual* for passive open spaces by up to approximately 17 dBA in the handball courts in the western portion of the Playground and up to approximately 15 dBA in the remainder of the Playground. However, noise levels in this area already exceed CEQR-recommended values under the existing condition. The CEQR guidelines, which provide for a relatively low noise level, intended as a goal for outdoor areas requiring serenity and quiet, such as passive open spaces, are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks.

The highest noise levels at the handball courts in the western portion of the Playground would be produced as a result of excavators, dump trucks and concrete delivery trucks operating at the Head End Site, and by construction traffic along Nevins Street, and would have the potential to occur over the course of the entire 48-month duration of CP-2 construction. The predicted noise level increases at the handball courts would be noticeable and would exceed *CEQR Technical Manual* impact criteria. However, the handball courts are used for active recreation, and therefore are not as sensitive to noise as a purely passive open space. Furthermore, the predicted noise levels during construction are comparable to existing noise levels at other handball courts and active recreation areas in New York City in proximity to heavily trafficked roadways or other urban noise sources. Therefore, the predicted levels of noise resulting from construction of the Project would not constitute a significant adverse impact at the handball courts.

The highest noise levels at the Douglass and Degraw Pool in the western portion of the Playground would be produced as a result of excavators, dump trucks and concrete delivery trucks operating at the Head End Site, and by construction traffic along Nevins Street, and would have the potential to occur over the course of the entire 48-month duration of CP-2 construction. While construction noise may be audible and noticeable at the Pool during some construction activities, the predicted noise level increases at the Pool would not exceed *CEQR Technical Manual* impact criteria and the total noise levels during construction would be comparable to those when the pool is in use. Consequently, the predicted levels of noise resulting from construction of the Project would not constitute a significant adverse impact at the Douglass and Degraw Pool.

Construction during CP-2 is predicted to produce noise levels in the high 50s to low 60s dBA at passive recreation areas in the eastern portion of the of the Thomas Greene Playground (i.e., near benches and pathways), resulting in noise level increases of up to approximately 10 dBA. The maximum noise levels predicted at passive recreation areas of the Playground would be produced as a result dump trucks, loaders, excavators, and dozers operating at the Head End Site. These activities would occur over the course of up to approximately 10 months. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low 50s to mid-60s dBA, resulting in noise level increases of up to 6 dBA. Total noise levels would exceed the 55 dBA L_{10} noise level for passive open spaces by up to approximately 10 dBA. However, noise levels in this area already exceed CEQR-recommended values under the existing condition. The CEQR guidelines, which provide for a relatively low noise level, intended as a goal for outdoor areas requiring serenity and quiet, such as passive open spaces, are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks. Therefore, the total noise levels would be comparable to the measured existing noise levels at site 10, and in the range considered typical for the Gowanus Canal area. Therefore noise levels as a result of CP-2 construction under the Alternative Construction Schedule Scenario are not predicted to result in a significant adverse impact at the remainder of the Thomas Greene Playground.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at Thomas Greene Playground comparable to or less than those for CP-2. At the western portion of the playground,~~.~~ ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases above ambient conditions of approximately 9 dBA (i.e., 6 dBA less than the 15 dBA maximum increment during CP-2). At the remainder of the Playground, including the Douglass and DeGraw Pool, construction associated with CP-1 is predicted to result in noise level increments less than the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, at the western portion of the playground, equipment and truck activity associated with CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels in the high 60s dBA, resulting in noise level increases above ambient conditions up to approximately 15 dBA (i.e., comparable to the 15 dBA maximum increment during CP-2). At the remainder of the Playground, including the Douglass and DeGraw Pool, construction associated with CP-3 is predicted to result in noise level increases up to 6 dBA above ambient conditions (i.e., 9 dBA less than the 15 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 would be approximately 20 ~~25~~ percent of the total volume during CP-2,~~ mainly in the form of material deliveries~~, which would result in lower levels of truck traffic.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would not be expected to interfere with use of the handball courts, pool, or passive recreation areas, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at Thomas Greene Playground (i.e., Receptor 35).

Receptors 61 and 62—Gowanus Canal

At the Gowanus Canal—Receptors 61 and 62—the existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels in the ~~mid~~low-50s to mid-60s dBA, resulting in noise level increases of up to approximately 16 dBA during the most noise-intensive periods of construction. The highest noise levels at the Canal would be produced as a result of dump trucks and excavators operating at both the Head End and Owls Head Sites, and would have the potential to occur over the course of the entire 48-month duration of CP-2 construction. While the predicted noise level increases at the Canal would be noticeable and would exceed *CEQR Technical Manual* impact criteria, the Canal is used for active recreation, and therefore, is not as sensitive to noise as a purely passive open space. Furthermore, the affected area of the Canal is only a relatively minor portion; the active recreation users would be able to utilize the remaining portion of the Canal not adjacent to construction noise if their experience is affected by the construction noise.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in elevated noise levels at the Gowanus Canal comparable to those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 would be expected to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions of approximately 12 dBA (i.e., 4 dBA less than the 16 dBA maximum increment during CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly,~~ Construction noise levels during the loudest activities during CP-1 and CP-3 would be less ~~CP-3 would be expected to result in lower construction noise levels~~ than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic.

Because the Canal is used for active recreation, and therefore, is not as sensitive to noise as a purely passive open space and the affected area of the Canal is a relatively minor portion, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at the Gowanus Canal (i.e., Receptors 61 and 62).

Receptor 31—Residential Receptor on Butler Street between Nevins Street and Bond Street

At the existing residential receptor located at 190 Butler Street between Nevins Street and Bond Street—Receptor 31—existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low~~ high 40s to low 60s dBA, resulting in noise level increases of up to approximately 12 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of loaders and dump trucks operating in the loading area of the Head End Site, and construction traffic along Butler Street during the site excavation activities. The predicted noise level increases at this residence would be noticeable and potentially intrusive and the total noise levels would be in the "clearly acceptable" range based on *CEQR Technical Manual* noise exposure criteria. Standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be below the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor at 190 Butler Street on Butler Street between Nevins Street and Bond Street comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in lower construction noise levels up to the mid 50s dBA, resulting in noise level increases above ambient conditions of up to approximately 7 dBA (i.e., 5 dBA less than the 12 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. While these noise level increases would be noticeable, ~~Consequently~~total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would ~~also~~ be in the "clearly acceptable" range according to *CEQR Technical Manual* noise exposure criteria and would not rise to the level of a significant adverse impact.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at 190 Butler Street on Butler Street between Nevins Street and Bond Street (i.e., Receptor 31).

Receptor 34—Hotel Receptor on Butler Street between Nevins Street and 3rd Avenue

At the existing hotel receptor located at 279 Butler Street between Nevins Street and 3rd Avenue—Receptor 34—existing noise levels are in the high 40s to high 50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low~~ high 40s to low 60s dBA, resulting in noise level increases of up to approximately 14 dBA. The maximum construction noise levels predicted at this receptor would be produced as a result of excavators, dozers and dump trucks operating in the loading area of the Head End Site, and construction traffic along Butler Street during the site excavation activities. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the "marginally acceptable" range based on *CEQR Technical Manual* noise exposure criteria. Standard building façade construction, along with an alternate means of ventilation allowing for the maintenance of a closed-window condition, would be expected to provide approximately 25 dBA window/wall attenuation. With such measures, interior noise levels at this residential receptor during construction would be below the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the residential receptor at 279 Butler Street on Butler Street between Nevins Street and 3rd Avenue comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck volumes associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions of up to approximately 8 dBA (i.e., 6 dBA less than the 14 dBA maximum increment during CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity during CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels in the low 60s dBA, resulting in noise level increases above ambient conditions up to approximately 11 dBA (i.e., 3 dBA less than the maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, mainly in the form of material deliveries, which would result in lower levels of truck traffic.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at 279 Butler Street on Butler Street between Nevins Street and 3rd Avenue (i.e., Receptor 34).

Receptors 56 and 60—Potential Conservative Analysis Receptors across Gowanus Canal from Owls Head Site

At the potential conservative analysis receptors located across the Gowanus Canal from the Owls Head Site—Receptors 56 and 60—existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the ~~mid~~high-~~50s~~ 40s to mid-60s dBA, resulting in noise level increases of up to approximately 17 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks, excavators, and dozers operating at the Owls Head site during site excavation activities, occurring over the course of approximately 10 months. The predicted noise level increases at these receptors would be noticeable and potentially intrusive and the total noise levels would be in the “clearly unacceptable” range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low to high 50s dBA, resulting in noise level increases of approximately 10 dBA. The maximum construction noise levels predicted at these receptors during these stages of CP-2 construction would result from the operation of clamshell excavators, hydromill excavators, and cranes. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the “clearly acceptable” to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ future potential conservative analysis receptors located across the Gowanus Canal from the Owls Head Site comparable to or less than those during CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 50s dBA, resulting in noise level increases up to approximately 11 dBA above ambient conditions (i.e., 6 dBA less than the 17 dBA maximum increment during the loudest period of CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity associated with CP-3

~~would be expected~~ are predicted to result in ~~lower~~ construction noise levels up to the high 50s dBA, resulting in noise level increases above ambient conditions of up to approximately 9 dBA (i.e., 8 dBA less than the 17 dBA maximum increment during the loudest period of CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, mainly in the form of material deliveries, which would result in lower levels of truck traffic. ~~Consequently~~While increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would ~~also~~ be in the “clearly acceptable” to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at the future potential conservative analysis receptors located across the Gowanus Canal from the Owls Head Site (i.e., Receptors 56 and 60).

Receptors 20 and 21—Residential Receptors at the Intersection of Butler Street and Bond Street

At the residential receptors located at the intersection of Butler Street and Bond Street—Receptors 20 and 21—existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the high 40s to mid-50s dBA, resulting in noise level increases of up to approximately 8 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks operating in the loading area of the Head End Site during site excavation activities and would occur over the course of 10 months. While the predicted noise level increases at these receptors would be noticeable and potentially intrusive during site excavation activities, the total noise levels would be in the “clearly acceptable” range based on *CEQR Technical Manual* noise exposure criteria. The maximum construction noise levels predicted at these receptors during slabs and below-grade elements removal, SOE, and below-grade structures activities would result from operation of concrete trucks and materials delivery trucks at the Head End Site.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at~~ residential receptors at the intersection of Butler Street and Bond Street comparable to or less than those during CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 50s dBA, resulting in noise level increases above ambient conditions below the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly,~~ Construction activities during CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 50s dBA, resulting in noise level increases above ambient conditions up to approximately 6 dBA (i.e., 2 dBA less than the 8 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2, ~~mainly in the form of material deliveries,~~ which would result in lower levels of truck traffic. ~~Consequently~~While noise level increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the “clearly acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at the residential receptors at the intersection of Butler Street and Bond Street (i.e., Receptors 20 and 21).

Receptors 16, 17, 24, 25, and 26—Residential Receptors West of Bond Street with Line of Sight to Head End Site

At the residential receptors located west of Bond Street with line of sight to the Head End Site—Receptors 16, 17, 24, 25, and 26—existing noise levels are in the high 40s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the high 40s to mid-60s dBA, resulting in noise level increases of up to approximately 11 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks operating in the loading area of the Head End Site during site excavation activities and would occur over the course of 10 months. While the predicted noise level increases at these receptors would be noticeable and potentially intrusive during site excavation activities, the total noise levels would be in the “clearly acceptable” to “marginally acceptable” range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low 50s to mid-60s dBA, resulting in noise level increases of up to 7 dBA. The maximum construction noise levels predicted at these receptors during slabs and below-grade elements removal, SOE, and below-grade structures activities would result from operation of concrete trucks and materials delivery trucks at the Head End Site. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the “clearly acceptable” to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at~~ residential receptors west of Bond Street with line of sight to the Head End Site comparable to or less than those during CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid-60s dBA, resulting in noise level increases above ambient conditions up to approximately 6 dBA (i.e., 5 dBA less than the 11 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. ~~Consequently~~While noise level increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the “clearly acceptable” ~~to “marginally acceptable”~~ to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential receptors west of Bond Street with line of sight to the Head End Site (i.e., Receptors 16, 17, 24, 25 and 26).

Receptor 28—Residential Receptor along Gowanus Canal with Line of Sight to Owls Head Site
At the residential receptor located at 365 Bond Street along the Gowanus Canal with line of sight to the Owls Head Site—Receptor 28—existing noise levels are in the high 40s to low 60s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the high 40s to low 60s dBA, resulting in noise level increases of up to approximately 10 dBA. The maximum construction noise levels predicted at this receptor would result from dump trucks, excavators, and dozers operating at the Owls Head site during site excavation activities, occurring over the course of approximately 10 months. The predicted noise level increases at 365 Bond Street would be noticeable and potentially intrusive and the total noise levels would be in the "clearly acceptable" range based on *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ existing residential receptors located at 365 Bond Street along the Gowanus Canal with line of sight to the Owls Head Site comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid-50s dBA, resulting in noise level increases above ambient conditions below the 5 dBA *CEQR Technical Manual* threshold for significant impact. Construction noise levels during the loudest activities during CP-1 and CP-3 would be ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ less than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately ~~25~~ 20 percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 would also be in the "clearly acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the entirety of the construction period at this receptor, noise produced by construction of the project would not rise to the level of a significant adverse impact at the existing residential receptors located at 365 Bond Street along the Gowanus Canal with line of sight to the Owls Head Site (i.e., Receptor 28).

Receptor 30—Residential Receptor on Butler Street between Bond Street and Nevins Street
At the existing residential receptors located at 211 Butler Street between Bond Street and Nevins Street—Receptor 30—existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the high 40s to low-60s dBA, resulting in noise level increases of up to approximately 12 dBA. The maximum construction noise levels predicted at this receptor would result from excavators, dozers, and dump truck operation at the Head End Site during site

excavation activities, and by construction traffic along Butler Street. These activities would occur over the course of up to approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be considered to be in the "clearly acceptable" to "marginally acceptable" range according to the *CEQR Technical Manual* noise exposure guidelines. Noise levels during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structure activities) would range from the high 40s to the low 60s dBA, resulting in noise level increases of up to approximately 10 dBA. The maximum construction noise levels predicted at these receptors during slabs and below-grade elements removal, SOE, and below-grade structures activities would result from operation of concrete trucks and materials delivery trucks at the Head End Site. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the "clearly acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ residential receptor at 211 Butler Street between Bond Street and Nevins Street comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 50s dBA, resulting in noise level increases above ambient conditions up to approximately 7 dBA (i.e., 5 dBA less than the 12 dBA maximum increment during CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity during CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting in noise level increases above ambient conditions up to approximately 9 dBA (i.e., 3 dBA less than the 12 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. ~~Consequently~~While noise level increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at the residential receptor at 211 Butler Street between Bond Street and Nevins Street (i.e., Receptor 30).

Receptor 33—Residential Receptors along Nevins Street North of Baltic Street

At the residential receptors located along Nevins Street north of Baltic Street—represented by Receptor 33—existing noise levels are in the high 40s to mid-50s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the high 40s to low 60s dBA, resulting in noise level increases of up to approximately 14 dBA. The maximum construction noise levels predicted at this receptor would result from excavators, dozers, and dump trucks operating in the loading area of the Head End Site, and construction traffic along Nevins Street during the site excavation activities. These activities would occur over the course of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the “clearly acceptable” range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structure) are predicted to produce noise levels at this receptor in the low to high 50s dBA, resulting in noise level increases of up to approximately 8 dBA. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the “clearly acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ residential receptors located along Nevins Street north of Baltic Street comparable to or less than those for CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the high 50s dBA, resulting in noise level increases above ambient conditions up to approximately 6 dBA (i.e., 8 dBA less than the 14 dBA maximum increment during CP-2). ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic.~~ Similarly, equipment and truck activity during CP-3 ~~would be expected~~ are predicted to result in ~~lower~~ construction noise levels up to the low 60s dBA, resulting ~~in~~ in noise level increases of up to approximately 10 dBA (i.e., 4 dBA less than the 14 dBA maximum increment during the loudest period of CP-2). Construction noise levels during the loudest activities of CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. ~~Consequently~~While noise level increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the “clearly acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project under the Alternative Construction Schedule Scenario would not rise to the level of a significant adverse impact at the residential receptor located along Nevins Street north of Baltic Street (i.e., Receptor 33).

Receptors 38, 42, and 43—Residential and Hotel Receptors on Union Street with Line of Sight to Head End Site

At the residential and hotel receptors located on Union Street with line of sight to the Head End Site—Receptors 38, 42, and 43—existing noise levels are in the high 40s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at these receptors in the high 40s to mid-60s dBA, resulting in noise level increases of up to approximately 10 dBA. The maximum construction noise levels predicted at these receptors would result from dump trucks operating in the loading area of the Head End Site and construction traffic along Sackett Street during site excavation activities. These activities would occur over the course of up to approximately 10 months. The predicted noise level increases at these receptors would be noticeable and potentially intrusive during site excavation activities, however, the total noise levels would be in the “clearly acceptable” to “marginally acceptable” range based on *CEQR Technical Manual* noise exposure criteria. Construction activities during the remaining 38-months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities) are predicted to produce noise levels at these receptors in the low 50s to low 60s dBA, resulting in noise level increases of up to approximately 6 dBA. While such increases in noise would be noticeable at times, the total noise levels would be typical for the Gowanus Canal area and in the "clearly acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ residential and hotel receptors located on Union Street with line of sight to the Head End Site comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected to~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases above ambient conditions of up to approximately 7 dBA (i.e., 3 dBA less than the 10 dBA maximum increment during CP-2). Construction noise levels during the loudest activities of CP-1 and CP-3 would be less ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels~~ than CP-2 primarily because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. ~~Consequently~~While noise level increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the "clearly acceptable" to "marginally acceptable" range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at these receptors would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at these receptors, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential and hotel receptors located on Union Street with line of sight to the Head End Site (i.e., Receptors 38, 42 and 43).

Receptor 39—Whole Foods Market Open Space across the 4th Street Basin from Owls Head Site

At the Whole Foods Market open space across the 4th Street Basin from the Owls Head site—Receptor 39—existing noise levels are in the mid 50s dBA. Construction during CP-2 is predicted to produce noise levels in the open space in the mid-50s to low 60s dBA, resulting in noise level increases of up to approximately 6 dBA during the most noise-intensive periods of construction. The predicted noise level increases at this open space location would be noticeable but would be in the range considered typical for the Gowanus Canal area. Total noise levels would exceed the 55 dBA L_{10} noise level for passive open spaces by up to approximately 10 dBA. However, noise levels in this area already exceed CEQR-recommended values under the existing condition. The CEQR guidelines, which provide for a relatively low noise level, intended as a goal for outdoor areas requiring serenity and quiet, such as passive open spaces, are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks. Therefore, the total noise levels would be comparable to the measured existing noise levels at site 11, and in the range considered typical for the Gowanus Canal area.

The predicted noise level increases at the Open Space would be noticeable and would exceed the *CEQR Technical Manual* impact criteria during site excavation activities. These activities would occur over the course of the 10 months. During the remaining 38 months of CP-2 (i.e., slabs and below-grade elements removal, SOE, and below-grade structures activities), noise level increases would not exceed *CEQR Technical Manual* impact criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the Whole Foods Market open space (i.e., Receptor 39) less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 and CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 50s dBA, resulting in noise level increases above ambient conditions less than the 5 dBA *CEQR Technical Manual* threshold for significant impact. Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 primarily ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 would be expected to result in lower construction noise levels than CP-2~~ because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries,~~ which would result in lower levels of truck traffic. Consequently, noise levels throughout construction associated with CP-1 and CP-3 would also not exceed the *CEQR Technical Manual* noise impact criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the residential receptor located at the Whole Foods Market open space (i.e., Receptor 39).

Receptor 40—Hotel Receptor at the Intersection of 3rd Avenue and Butler Street

At the hotel receptors located at 181 3rd Avenue at the intersection of 3rd Avenue and Butler Street—Receptor 40—existing noise levels are in the high 40s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the high 40s to mid-60s dBA, resulting in noise level increases of up to approximately 10 dBA. The maximum construction noise levels predicted at this receptor would result from excavators, dozers, and dump trucks operating in the loading area of the Head End Site, and construction traffic along Nevins Street during the site excavation activities. These activities would occur over the course of approximately 10 months. While predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities, the total noise levels would be in the "clearly acceptable" to "marginally acceptable" range based on *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ hotel receptor located at 181 3rd Avenue at the intersection of 3rd Avenue and Butler Street comparable to or less than those during CP-2. ~~As discussed in the "Analysis Periods" discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~ are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases above ambient conditions less than the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2,~~

~~mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly~~Construction activities during~~,~~ CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases above ambient conditions up to approximately 6 dBA, (i.e., 4 dBA less than the 10 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 would be approximately 20 ~~25~~ percent of the total volume during CP-2, ~~mainly in the form of material deliveries,~~ which would result in lower levels of truck traffic. ~~Consequently~~While noise level increments of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the “clearly acceptable” to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the hotel receptor at 181 3rd Avenue located at the intersection of 3rd Avenue and Butler Street (i.e., Receptor 40).

Receptor 44—Residential Receptor at the Intersection of 3rd Avenue and 6th Street

At the residential receptors located at 406 3rd Avenue at the intersection of 3rd Avenue and 6th Street—Receptor 44—existing noise levels are in the high 40s to mid-60s dBA. Construction during CP-2 is predicted to produce noise levels at this receptor in the ~~low~~ high 40 ~~50s~~ to mid-60s dBA, resulting in noise level increases of up to approximately 10 dBA. The maximum construction noise levels predicted at this receptor would result from excavators, dozers, and dump trucks operating in the loading area of the Owls Head site. These activities would occur over the course of approximately 10 months. The predicted noise level increases at this receptor would be noticeable and potentially intrusive during site excavation activities and the total noise levels would be in the “clearly acceptable” to “marginally acceptable” range based on *CEQR Technical Manual* noise exposure criteria.

Construction during CP-1 (site preparation, utility relocation and abatement, and demolition), expected to occur for approximately 9 months, and CP-3 (above-grade structures, conveyances, and outfalls), expected to occur for approximately 24 months, would be expected at times to result in ~~elevated~~ noise levels at the ~~residential receptor at the~~ residential receptor located at 406 3rd Avenue at the intersection of 3rd Avenue and 6th Street comparable to or less than those during CP-2. ~~As discussed in the “Analysis Periods” discussion above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases above ambient conditions less than the 5 dBA *CEQR Technical Manual* threshold for significant impact. ~~than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 would be approximately 10 percent of the total volume during CP-2, mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, C~~Construction activities during CP-3 ~~would be expected~~are predicted to result in ~~lower~~ construction noise levels up to the mid 60s dBA, resulting in noise level increases up to approximately 8 dBA above ambient conditions (i.e., 2 dBA less than the 10 dBA maximum increment during CP-2). Construction noise levels during the loudest activities during CP-1 and CP-3 would be less than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately 20 ~~25~~ percent of the total volume during CP-2~~, mainly in the form of material deliveries~~, which would result in lower levels of truck traffic. ~~Consequently~~While noise level increases of this magnitude would be noticeable, total~~,~~ noise levels throughout construction associated with CP-1 and CP-3 would also be in the “clearly acceptable” to “marginally acceptable” range according to *CEQR Technical Manual* noise exposure criteria.

Because the maximum construction noise levels predicted to occur at this receptor would have a relatively short duration, and the magnitude of construction noise levels would be in the acceptable range throughout the remainder of the construction period at this receptor, noise produced by construction of the Project would not rise to the level of a significant adverse impact at the hotel receptor at 406 3rd Avenue located at the intersection of 3rd Avenue and 6th Street (i.e., Receptor 44).

All Other Receptors

At all other receptors in the study area, construction during CP-2 under the Alternative Construction Schedule Scenario is predicted to produce noise levels below the existing noise levels and would not rise to the level of significant adverse impact. ~~As discussed in "Analysis Periods" above, s~~Stationary equipment and truck ~~volumes~~ activity associated with CP-1 (site preparation, utility relocation and abatement, and demolition) and CP-3 (above-grade structures, conveyances, and outfalls) ~~would be expected to~~would result in comparable or lower construction noise levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-1 or CP-3 (i.e., demolition debris removal for CP-1 or material deliveries for CP-3) would be approximately ~~10~~ 20 percent of the total volume during CP-2, ~~mainly in the form of demolition debris, which would result in lower levels of truck traffic. Similarly, CP-3 (above-grade structures, conveyances, and outfalls) would be expected to result in lower construction noise levels than CP-2 because the total volume of material required to be transported to and delivered from the site during CP-3 would be approximately 25 percent of the total volume during CP-2, mainly in the form of material deliveries,~~ which would result in lower levels of truck traffic. Because the maximum construction noise levels predicted to occur at these receptors would not rise to the level of significant adverse impact, noise produced by construction of the Project would not rise to the level of a significant adverse impact at all other receptors not already discussed.

CONSTRUCTION NOISE ANALYSIS CONCLUSION

Construction of the Project under the Alternative Construction Schedule Scenario is predicted to result in elevated noise levels at several of the analyzed receptors, which represent the residences, hotels, and publicly accessible open spaces.

At the residential receptors at 282 and 285 Nevins Street—Receptors 36 and 37—the Project under the Alternative Construction Schedule Scenario would result in potential temporary significant adverse construction noise impacts. These are the same locations that were identified as potentially experiencing temporary significant adverse noise impacts as a result of construction of the Project with only weekday construction. Construction of the Project under the Alternative Construction Schedule Scenario would result in noticeable and potentially intrusive increases in noise levels at these receptors intermittently over the course of ~~CP-2~~ construction, primarily as the result of dump trucks in the Head End Site staging area and construction traffic along Nevins Street. ~~Although construction of the Project would result in noise level increases during CP-1 and CP-3 construction that would be less than those during CP-2 construction, these increases may still result in exceedances of *CEQR Technical Manual* noise impact criteria.~~ Potential mitigation measures for the predicted construction noise impacts at these receptors are discussed further in Chapter 23 "Mitigation."

At potential conservative analysis receptors identified to conservatively evaluate the Project's effect on potential future land use changes across the Canal and Nevins Street from the Head End Site—Receptors 57, 58, and 59—the Project under the Alternative Construction Schedule Scenario would not result in potential significant adverse construction noise impacts because these receptors only represent the Project's effect on potential future land use changes and currently do not exist. If noise-sensitive uses were developed on these locations in the future, construction of the Project would result in noticeable and potentially intrusive increases in noise levels at these receptors intermittently over the course of ~~CP-2~~ construction, primarily as the result of dump trucks in the Head End Site staging area and construction traffic along Nevins Street. ~~Although construction of the Project would result in noise level increases during CP-1 and CP-3 construction that would be less than those during CP-2 construction, these increases may still result in exceedances of *CEQR Technical Manual* noise impact criteria.~~ If these locations allow for noise sensitive uses in the future, noise exposure from construction of the Project and potential measures to mitigate such noise would be considered in a future environmental review.

At open space areas in the vicinity of the proposed construction work areas, including the western portion of the Thomas Greene Playground and the Gowanus Canal, noise levels during construction of the Project under the Alternative Construction Schedule Scenario would exceed *CEQR Technical Manual* noise impact criteria and *CEQR Technical Manual* noise exposure guidelines, although existing noise levels already exceed these noise exposure guidelines. The Project under the Alternative Construction Schedule Scenario would not result in significant adverse construction noise impacts at these receptors, because the active recreation areas are not as sensitive to noise as purely passive open spaces, and the predicted levels of noise at the passive open spaces would not rise to the level of significant adverse noise impacts.

At other receptors near the construction work areas, noise levels due to construction of the Project under the Alternative Construction Schedule Scenario would be noticeable and potentially intrusive at times during the most intensive construction activities (CP-2), however they would be in the range considered typical for the Gowanus Canal area. Furthermore, the surrounding residences and hotels are constructed with insulated glass windows and appear to have alternate means of ventilation (i.e., air conditioning), which would allow for the maintenance of a closed window condition and consequently reduced interior noise levels. Similarly, future hotels and residences are expected to be constructed with insulated glass windows and an alternate means of ventilation (i.e., air conditioning). Therefore, the predicted levels of construction noise were not determined to rise to the level of a significant adverse impact at these residential, hotel, or other indoor noise receptors.

OPEN SPACE

There are no publicly accessible open spaces within the Project Sites and no open space resources would be used for staging or other construction activities. Access to any nearby open space resources including Thomas Greene Playground would be maintained throughout the duration of the construction period, regardless of whether the activities would occur on weekdays or on weekends.

As discussed above, at open space areas in the vicinity of the proposed construction work areas, including the western portion of the Thomas Greene Playground and the Gowanus Canal, noise levels during construction of the Project under the Alternative Construction Schedule Scenario would exceed *CEQR Technical Manual* noise impact criteria and *CEQR Technical Manual* noise exposure guidelines, although existing noise levels already exceed these noise exposure guidelines. The Project under the Alternative Construction Schedule Scenario would not result in significant adverse construction noise impacts at these receptors, because the active recreation areas are not as sensitive to noise as purely passive open spaces, and the predicted levels of noise at the passive open spaces would not rise to the level of significant adverse noise impacts.

While the predicted noise levels at the western portion of the Thomas Greene Playground and the Gowanus Canal due to construction of the Project would be noticeable and potentially intrusive at times and would exceed 55 dBA $L_{10(1)}$ (the threshold recommended for open space uses according to the *CEQR Technical Manual* noise exposure guidance), these open spaces are used primarily for active recreation and are consequently not as sensitive to noise as a purely passive open space. Furthermore, the measured existing noise levels in these open space areas also exceeded the 55 dBA threshold, and the predicted construction noise levels, in the mid-70s dBA, are comparable to noise levels in many open space areas throughout New York City in proximity to heavily trafficked roadways and other sources of noise. The predicted construction noise levels are also comparable to the 75 dBA noise level cited in the *CEQR Technical Manual* as occurring at the boundary of school playgrounds, whose user makeup is comparable to that of the Thomas Greene Playground's active recreation areas (e.g., handball courts). Therefore, many areas within these open spaces that would not be adversely affected by noise from the Project. ✷

Chapter 21: Environmental Justice

A. INTRODUCTION

The Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project (the Project) would result in the construction and operation of CSO facilities at two sites along the Gowanus Canal. The Project is mandated by the United States Environmental Protection Agency (USEPA) to satisfy remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). The concepts of environmental justice and environmental justice analysis were established by Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* (February 11, 1994). In addition, certain state agencies, such as the New York State Department of Environmental Conservation (NYSDEC), have developed their own policies for incorporating environmental justice concerns into environmental review.

On March 19, 2003, NYSDEC issued *Commissioner's Policy (CP)-29 Environmental Justice and Permitting* (the Policy),[1] to address environmental justice concerns and ensure community participation in the NYSDEC permit review process and the NYSDEC application of SEQRA. This environmental justice analysis has been prepared in accordance with the Policy to identify and address any potential adverse impacts on minority or low-income populations that could result from the Project. The Policy is intended to encourage meaningful public participation by environmental justice stakeholders around the State, including minority and low-income communities, in the environmental review process. For residents, meaningful public participation means having access to crucial information early in the permit process and having environmental justice concerns included in the environmental impact assessment review.

In addition, this environmental justice analysis is consistent with the intent of the New York City Council's recent environmental justice legislation (INT. 359 and INT. 886), passed on April 5, 2017. While the new legislation does not create an additional or separate process for project-specific environmental justice review, it ensures that New York City Department of Environmental Protection (DEP), along with the New York City Department of Health and Mental Hygiene, will identify and study environmental justice communities, neighborhoods with a significant low-income population, or communities of color.[2] The new laws require the creation of an environmental justice Interagency Working Group (IWG) to conduct a comprehensive environmental justice study identifying the locations and boundaries of environmental justice areas within the City. The environmental justice study will describe environmental concerns affecting these areas, and identify data, studies, programs, and other resources that are available and that may be used to advance environmental justice goals. The City is in the process of setting up the IWG, which will oversee the City's environmental justice-related matters.

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[1] NYSDEC, CP-29 Environmental Justice and Permitting, March 19, 2003.

[2] "City Council Passes Most Comprehensive Environmental Justice Legislation in Nation," New York City Council, April 5, 2017 (https://council.nyc.gov/costa-constantinides/2017/04/05/230/, last accessed on July 19, 2017)

This analysis will assist DEP, as lead agency, with its application of the New York State Environmental Quality Review Act (SEQRA), City Environmental Quality Review (CEQR), and the Uniform Land Use Review Procedure (ULURP).

Moreover, the Project would require a state pollutant discharge elimination system (SPDES) permit for dewatering and discharge of industrial wastewater from the CSO Facilities, which is subject to NYSDEC's environmental justice policy. Specifically, DEP is seeking an Individual SPDES permit (or its equivalent) for the discharge of industrial wastewater to the waters of New York State through *Application Form NY-2C for Industrial Facilities*; and modification to a SPDES permit (Individual Permit) for the discharge of wastewater from a publically owned treatment works (POTW) through *Application Form NY-2A*. Therefore, this environmental justice analysis will also serve to assist NYSDEC in its permit review process.

B. METHODOLOGY

As set forth in the Policy, "Environmental justice means the fair treatment and meaningful involvement of all people regardless of race, color, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."

Following the Policy, this environmental justice analysis identifies potential significant adverse environmental impacts and the area to be affected by the Project (i.e., establishes the study area) and determines whether potential adverse environmental impacts (as identified in the other chapters of this ~~D~~FEIS) are likely to affect a potential environmental justice area (i.e., a minority or low-income community). In addition, this analysis identifies the potential environmental justice area(s) to be affected, describes the existing environmental burden on the potential environmental justice area(s), and evaluates the additional burden of any significant adverse environmental impact on the potential environmental justice area(s).

In accordance with the Policy, existing sources of pollution or similar facility types in the study area are analyzed in order to establish the baseline conditions against which project impacts are assessed. Consistent with the Policy, any potential significant adverse impacts will be avoided or minimized to the greatest extent practicable. The Policy also requires that public outreach be conducted to ensure meaningful and effective public participation by the potentially affected communities. Therefore, a summary of the project's public participation program is included at the end of this chapter.

DELINEATION OF THE STUDY AREA

The study area for this environmental justice analysis is similar to the Socioeconomic Study Area (see Figure 3-1 in Chapter 3, "Socioeconomic Conditions") and includes all census block groups that are substantially within approximately ¼ mile of the Project Sites (see **Figure 21-1**). Construction of the Head End Facility would require the lease or acquisition of three privately owned parcels adjacent to the Canal and is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1). Construction of the Owls Head Facility would require the lease or acquisition of up to four privately owned parcels adjacent to the Canal and is proposed to be located at 2 2nd Avenue (Block 977, Lot 3), 110 5th Street (Block 990, Lot 21), 122 5th Street (Block 990, Lot 16), 22 2nd Avenue (Block 990, Lot 1), and 5th Street (Block 977, Lot 1), with portions of this area used for construction staging. The

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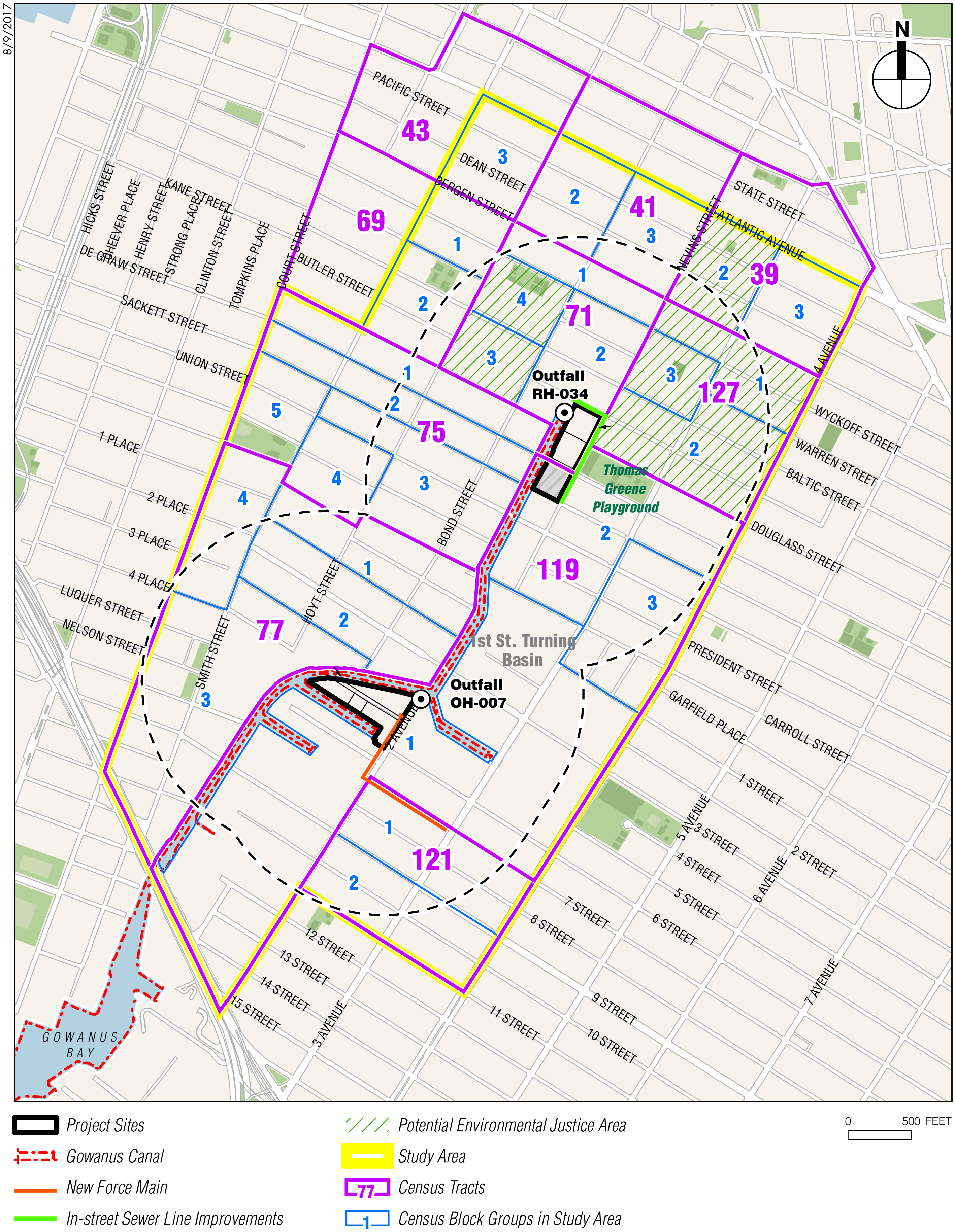


Gowanus Canal CSO Facilities

Environmental Justice Study Area

Figure 21-1

residential areas surrounding the Canal include the neighborhoods of Gowanus, Park Slope, Cobble Hill, Carroll Gardens, and Red Hook, with an increasing residential presence located near the waterway. The Head End Site is immediately surrounded by commercial, light-industrial, and residential uses—an increasingly common mix around the Canal and in the surrounding area. Major sewer infrastructure is also located proximate to the Head End Site. Specifically, the DEP Gowanus Wastewater Pumping Station is located immediately to the west of the Head End Site along Butler Street, and is part of the wastewater conveyance and treatment system connecting to the Red Hook Wastewater Treatment Plant (WWTP). In addition, the Gowanus Canal Flushing Tunnel discharges to the Canal opposite the Head End Site. The Owls Head Site is primarily surrounded by manufacturing and shipping facilities in one- and two-story buildings, located on both sides of the Canal. As this area is farther away from residential neighborhoods than the Head End Site, it is more industrial in character and contains fewer other uses. In general, residential uses in the study area are concentrated north of 3rd Street and west of Bond Street; near the intersection of 3rd Avenue and Carroll Street; along Butler Street; and north of Baltic Street and east of Bond Street. The study area's residential uses include two New York City Housing Authority (NYCHA) residential developments—Wyckoff Gardens north of the Head End Site on Nevins Street and Gowanus Houses, west of the Head End Site.

DEFINING POTENTIAL ENVIRONMENTAL JUSTICE AREAS IN THE STUDY AREA

According to the Policy, potential environmental justice areas include minority or low-income communities. Those communities are defined as follows:

- Minority communities: The Policy defines minority populations to include Hispanic, African-American or Black, Asian and Pacific Islander, and American Indian. This environmental justice analysis also considers minority populations to include Alaska Native as well as persons who identified themselves as being either "some other race" or "two or more races" in the latest American Community Survey (ACS). According to the Policy, a minority community is a census block group, or contiguous area with multiple census block groups, having a minority population equal to or greater than "51.1" percent of the total population in an urban area and "33.8" percent of the total population in a rural area. The study area is within an urban area, as established by the U.S. Census Bureau. Therefore, any census block group with a minority population equal to or greater than 51.1 percent was considered to be a potential environmental justice area.
- Low-income communities: The Policy defines a low-income population as a population with an annual income below the poverty threshold as defined by the U.S. Census Bureau. For each census block group in the study area, data were compiled on the percentage of persons living below the poverty threshold. In accordance with the Policy, this environmental justice analysis defines a low-income community to be a census block group, or contiguous area with multiple census block groups, where the low-income population (i.e., persons living below the poverty threshold) is equal to or greater than "23.59" percent of the total population.

To identify minority and low-income populations within the study area, demographic information was obtained from the U.S. Census Bureau's 2011–2015 ACS 5-Year Estimates. Demographic data such as total population, race and ethnicity, and poverty status were compiled at the census block group level for each census block group in the study area, and aggregated for the study area as a whole. In addition, data were compiled for Brooklyn and for New York City as a whole to allow for a comparison of study area characteristics to larger reference areas.

C. IDENTIFICATION OF POTENTIAL ENVIRONMENTAL JUSTICE AREAS

Using the methodology described above, 6 of the 28 census block groups within the study area (listed in **Table 21-1**) are considered potential environmental justice areas, as shown in **Figure 21-1**. All of the potential environmental justice areas include minority communities, and three also include low-income communities. The minority population percentages range from 51.3 to 100 percent. The study area as a whole has a minority population of 47.8 percent, compared with 64.3 percent in Brooklyn and 67.5 percent in New York City as a whole. Of the minority populations in the study area, the Hispanic population accounts for the greatest proportion of the total population in the study area (23.7 percent), followed by Black or African American populations (13.5 percent) and then by Asian populations (7.2 percent of the study area population). The three low-income communities in the study area have low-income population percentages ranging from 30.17 to 42.81 percent. The low-income population in the study area as a whole is 12.06 percent—well below NYSDEC's 23.59 threshold—compared with 23.2 percent in Brooklyn and 20.6 percent in New York City overall.

The Head End Site is located in Census Tract 71 Block Group 2 and Census Tract 119 Block Group 2, which are non-minority and non-low-income and not potential environmental justice areas. The Owls Head Site is located in Census Tract 119 Block Group 1, which is also not a potential environmental justice area. However, potential environmental justice areas exist proximate to the Head End Site (see **Figure 21-1**). These areas include NYCHA residential developments.

Table 21-1
Study Area Race and Ethnicity and Poverty Status

Census Tract	Block Group	2011–2015 Total Population	Race and Ethnicity*										Total Minority (%)	Poverty Status (%)
			White	%	Black	%	Asian	%	Other	%	Hispanic	%		
39	2	460	224	48.7%	27	5.9%	25	5.4%	12	2.6%	172	37.4%	**51.3%**	5.65%
39	3	464	314	67.7%	41	8.8%	79	17.0%	21	4.5%	9	1.9%	32.3%	2.37%
41	2	1,259	781	62.0%	197	15.7%	108	8.6%	24	1.9%	149	11.8%	38.0%	5.93%
41	3	822	693	84.3%	31	3.8%	56	6.8%	10	1.2%	32	3.9%	15.7%	6.66%
43	3	995	577	58.0%	71	7.1%	10	1.0%	51	5.1%	286	28.7%	42.0%	1.97%
69	1	628	422	67.2%	62	9.9%	30	4.8%	28	4.5%	86	13.7%	32.8%	3.38%
69	2	868	555	63.9%	74	8.5%	52	6.0%	12	1.4%	175	20.2%	36.1%	0.81%
71	1	774	520	67.2%	160	20.7%	20	2.6%	38	4.9%	36	4.7%	32.8%	6.20%
71	2	784	504	64.3%	54	6.9%	33	4.2%	18	2.3%	175	22.3%	35.7%	10.46%
71	3	1,505	5	0.3%	665	44.2%	10	0.7%	0	0.0%	825	54.8%	**99.7%**	**30.17%**
71	4	1,939	0	0.0%	677	34.9%	61	3.1%	152	7.8%	1,049	54.1%	**100.0%**	**42.81%**
75	1	950	650	68.4%	3	0.3%	128	13.5%	19	2.0%	150	15.8%	31.6%	10.00%
75	2	1,058	736	69.6%	0	0.0%	31	2.9%	65	6.1%	226	21.4%	30.4%	0.00%
75	3	1,297	834	64.3%	0	0.0%	233	18.0%	0	0.0%	230	17.7%	35.7%	0.00%
75	4	926	845	91.3%	0	0.0%	25	2.7%	34	3.7%	22	2.4%	8.7%	1.30%
75	5	543	268	49.4%	0	0.0%	136	25.0%	35	6.4%	104	19.2%	50.6%	16.02%
77	1	1,015	885	87.2%	0	0.0%	0	0.0%	0	0.0%	130	12.8%	12.8%	9.56%
77	2	673	563	83.7%	9	1.3%	21	3.1%	18	2.7%	62	9.2%	16.3%	5.50%
77	3	1,764	927	52.6%	43	2.4%	171	9.7%	110	6.2%	513	29.1%	47.4%	0.91%
77	4	957	769	80.4%	20	2.1%	59	6.2%	56	5.9%	53	5.5%	19.6%	7.31%
119	1	612	371	60.6%	33	5.4%	39	6.4%	64	10.5%	105	17.2%	39.4%	0.00%
119	2	503	276	54.9%	16	3.2%	21	4.2%	38	7.6%	152	30.2%	45.1%	12.42%
119	3	499	306	61.3%	17	3.4%	37	7.4%	6	1.2%	133	26.7%	38.7%	13.03%
121	1	870	540	62.1%	18	2.1%	69	7.9%	16	1.8%	227	26.1%	37.9%	9.08%
121	2	937	474	50.6%	74	7.9%	110	11.7%	39	4.2%	240	25.6%	49.4%	10.88%
127	1	1,175	558	47.5%	183	15.6%	186	15.8%	21	1.8%	227	19.3%	**52.5%**	12.77%
127	2	1,200	426	35.5%	335	27.9%	46	3.8%	0	0.0%	393	32.8%	**64.5%**	7.67%
127	3	1,554	91	5.9%	827	53.2%	157	10.1%	38	2.4%	441	28.4%	**94.1%**	**41.51%**

Table 21-1 (cont'd)
Study Area Race and Ethnicity and Poverty Status

Census Tract	Block Group	2011–2015 Total Population	Race and Ethnicity*										Total Minority (%)	Poverty Status (%)
			White	%	Black	%	Asian	%	Other	%	Hispanic	%		
Study Area		27,031	14,114	52.2%	3,637	13.5%	1,953	7.2%	925	3.4%	6,402	23.7%	47.8%	12.06%
Brooklyn		2,595,259	926,945	35.7%	809,358	31.2%	296,003	11.4%	53,710	2.1%	509,243	19.6%	**64.3%**	23.20%
New York City		8,426,743	2,739,755	32.5%	1,885,085	22.4%	1,130,979	13.4%	233,627	2.8%	2,437,297	28.9%	**67.5%**	20.60%

Notes:
*Shading indicates minority and/or low-income community.
Bold indicates exceedance of minority or low-income threshold.
The racial and ethnic categories provided are further defined as: White (White alone, not Hispanic or Latino); Black (Black or African American alone, not Hispanic or Latino); Asian (Asian alone, not Hispanic or Latino); Other (American Indian and Alaska Native alone, not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone, not Hispanic or Latino; Some other race alone, not Hispanic or Latino; Two or more races, not Hispanic or Latino); Hispanic (Hispanic or Latino; Persons of Hispanic origin may be of any race).
Source:
U.S. Census Bureau, 2011–2015 American Community Survey 5-Year Estimates.

D. ENVIRONMENTAL BURDENS IN THE STUDY AREA

In accordance with the Policy, existing sources of pollution in the study area should be considered in order to establish the baseline conditions against which impacts of the Project are assessed. This section identifies existing sources of environmental pollution not related to the Project that may be a burden on the community, and assesses conditions in the 2028 future analysis year.

EXISTING CONDITIONS

The study area includes a number of vacant, underused industrial and manufacturing uses, which may be a burden on the local community. In particular, the properties fronting the Canal to the south of the Head End Site and on the western side of the Canal include one- to three-story distribution and warehouse or light manufacturing buildings, as well as open storage yards and truck/bus parking and artist workspace and studios. The area north of the Head End Site along Baltic and Butler Street and east of the Head End Site between Nevins Street and 3rd Avenue contains a mix of uses, including vacant former manufacturing buildings. A former manufacturing building immediately north of the Head End Site (239 Butler Street) is currently vacant, although it is proposed to undergo renovations to convert it into a hotel.

In addition, the study area includes potentially contaminated properties, particularly in the areas immediately surrounding the Project Sites. However, these conditions are expected to improve in the future analysis year (see below).

FUTURE CONDITIONS IN THE ANALYSIS YEAR

Independent of the Project, USEPA and NYSDEC have mandated that other parties undertake clean-up activities for contaminated properties in the area of the Canal. As discussed in Chapter 1, "Project Description," these activities will include: the installation of containment/cutoff walls, the excavation or stabilization of contamination on parcels along the Canal, the dredging of the Canal, the restoration of the 1st Street and 4th Street turning basins, and the installation of coal tar extraction wells. The properties composing the Head End Site will be remediated by National Grid pursuant to NYSDEC administrative orders and in coordination with the remediation required by CERCLA (see Chapter 10, "Hazardous Materials"). National Grid's remediation of the properties within the Head End Site will be completed prior to construction of the Head End Facility. USEPA Region 2 developed a Community Involvement Plan for the Gowanus Canal Superfund Site to facilitate two-way communication between the agency and the local community, and to encourage community involvement in remediation activities.[3]

In addition, National Grid is remediating the site of another former manufactured gas plant located near the Owls Head Site on the western side of the Canal; when completed, this remediation will allow for the redevelopment of the site with a mixed-use project (the Gowanus Green/Public Place project, as discussed in Chapter 2, "Land Use, Zoning, and Public Policy").

Moreover, new economic development opportunities in the study area are anticipated to be created as a result of a comprehensive planning study of the neighborhood under the City's Planning for Livability, Affordability, Community, Economic Opportunity and Sustainability (PLACES) program. The Gowanus PLACES Neighborhood Planning Study seeks to foster a thriving, working, and more resilient neighborhood by reinforcing and encouraging a stronger local economy anchored by a mix of uses and businesses, while creating opportunities for new housing with affordable housing in appropriate locations.

[3] https://semspub.epa.gov/work/02/283916.pdf, last accessed on June 28, 2017.

A robust community outreach process began in 2017 to gather input for a planning and land use framework for the area (see Chapter 2, "Land Use, Zoning, and Public Policy").

E. ANALYSIS OF THE POTENTIAL FOR SIGNIFICANT ADVERSE IMPACTS IN THE STUDY AREA

The Project is intended to comply with the USEPA ROD and would reduce the discharge of CSO solids to the Canal. Most of the Project's potential effects would be associated with construction and, therefore, would be temporary (see Chapter 20, "Construction"). These effects, including construction-related traffic and air quality associated with construction activities, would primarily be contained within the areas immediately surrounding the Project Sites, which are mostly composed of industrial and manufacturing uses (see Chapter 2, "Land Use, Zoning, and Public Policy").

However, as discussed in Chapter 7, "Historic and Cultural Resources," there would be a permanent potential significant adverse impact to ~~certain~~ architectural resources on the Head End Site and to the State/National Register (S/NR)-eligible Gowanus Canal Historic District due to demolition of S/NR-eligible properties; this demolition is necessary to complete the Project as mandated by USEPA. The Head End Site is located within the boundaries of a ~~proposed 2014~~ Gowanus Canal Historic District that was proposed for listing on the S/NR by the New York State Historic Preservation Office (SHPO) in 2014. However, in response to community comments, the New York State Board for Historic Preservation review for the State Register listing of the Gowanus Canal Historic District has been postponed. The SHPO determined the Gowanus Canal Historic District to be S/NR-eligible in 2012~~did not go forward but was subsequently determined S/NR-eligible by the New York State Historic Preservation Office (SHPO).~~

The buildings at 242-244 Nevins Street, 270 Nevins Street, and 234 Butler Street, which include the two-story former Gowanus Station and associated warehouse and factory buildings on Butler and Nevins Streets, contribute to the significance of the S/NR-eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. DEP has determined that ~~and~~ their demolition would constitute a significant adverse impact to architectural resources on the Head End Site and to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR. Accordingly~~Therefore~~, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to ~~avoid or~~ minimize to the extent practicable the adverse impact that would occur through demolition. However, these impacts would not be expected to result in disproportionate impacts on minority and low-income communities, either during construction or operational periods, since historic impacts would affect all populations surrounding the Head End Site, including those within minority or low-income communities and those within non-minority and non-low-income communities. The buildings on the Head End Site are located in non-minority and non-low-income communities (Census Tract 71 Block Group 2 and Census Tract 119 Block Group 2) and are proximate to potential environmental justice areas. These buildings do not represent significant community resources whose loss would affect a potential environmental justice area, including those near the Head End Site. As such, the loss of these industrial buildings would not be expected to result in any significant adverse burden on potential environmental justice areas.

Ground surface impacts from the Project would consist of excavation associated with construction. Portions of the Head End Site and Nevins Street are sensitive for deeply buried prehistoric and mill-related resources at depths greater than 10 to 15 feet below grade. Undisturbed portions of the 7th Street streetbed are sensitive for the presence of human remains associated with the Battle of Brooklyn. The Head End and Owls Sites are also sensitive for the presence of timber cribbing associated with the Canal and archaeological resources of an industrial nature (see Chapter 7, "Historic and Cultural Resources"). If these resources are present and retain both integrity and significance, the Project would result in a potential significant adverse impact on archaeological resources. Impacts would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and the New York City Landmarks Preservation Commission (LPC). As the Gowanus Canal bulkheads are S/NR-eligible, removal and replacement of the bulkhead at the Owls Head Site would result in a potential significant adverse impact. Therefore, consultation is being undertaken with SHPO and LPC to identify measures to avoid, minimize, or mitigate adverse impacts. However, these impacts would not be expected to result in disproportionate impacts on minority and low-income communities, either during construction or operational periods, since archeological impacts would affect all populations surrounding the project sites including those within minority or low-income communities and those within non-minority and non-low-income communities.

As discussed in Chapter 20, "Construction," construction of the Project is predicted to create elevated noise levels that do not constitute significant adverse impacts at several of the analyzed receptors adjacent to the construction work areas. However, there would be temporary adverse construction noise impacts affecting one non-environmental justice area. Construction of the Project would result in potential temporary significant adverse noise impacts at existing residences at 282 and 285 Nevins Street (See Noise Receptors 36 and 37 on Figure 20-20). These residential receptors are located in one non-minority and non-low-income area that is not a potential environmental justice area (Census Tract 119 Block Group 2, which also includes Thomas Greene Playground, as shown on **Figure 21-1)**. Construction of the Project would result in noticeable and potentially intrusive increases in noise levels at these receptors intermittently over the course of the construction period, primarily as the result of dump trucks in the Head End Site staging area and construction traffic along Nevins Street. As described in Chapter 23 "Mitigation," there are no feasible and practical mitigation measures that would be effective in reducing the amount of construction noise at these receptors.

The Project's other operational and construction-related effects do not constitute significant adverse impacts, and therefore, would not significantly affect the residential populations in the study area, including minority and low-income populations.

F. PUBLIC PARTICIPATION

In accordance with the Policy, public participation ~~has been~~was sought from the affected communities and will continue throughout the Project's environmental and land use review processes. This participation included~~s~~ a public scoping meeting that was held on May 4, 2017, which raised the need to address environmental justice in the~~is~~ Draft ~~Environmental Impact Statement~~EIS (DEIS) in response to public comment. Publication of the DEIS and issuance of the Notice of Completion on September 14, 2017 signaled~~s~~ the start of the public review period. During this period, ~~which must extend for a minimum of 30 days,~~ the public may review and comment on the DEIS either in writing or at a public hearing convened for the purpose of receiving such comments. The joint public hearing on the DEIS and the ULURP was held on January 17, 2018. The period for submitting written comments remained open until January 29, 2018. ~~Additional opportunities for public participation will include~~d ~~a comment period on the Draft Environmental Impact Statement (DEIS), as well as public hearings on the ULURP application.~~ More information on the Project's public review process is contained in Chapter 1, "Project Description." Furthermore, publicly accessible open space to be provided on the Head End Site will be determined through additional facility design in consultation with the local community and other City agencies. In addition, NYSDEC may require preparation of a Public Participation Plan as part of the permitting process for the Project. DEP will provide all relevant materials on their website and at accessible document repositories.

G. CONCLUSIONS

Using the methodology described above, 5 of the study area's 21 block groups have been determined to be a potential environmental justice area, based on the presence of low-income and minority populations higher than the thresholds provided in NYSDEC's Policy. As discussed above, the Project Sites are immediately surrounded by a predominance of industrial and manufacturing uses, and the Project is not expected to result in any potential significant adverse impacts, other than permanent impacts to certain architectural and archeological resources due to excavation and demolition of structures during the construction phase and temporary construction-related noise impacts.

Demolition of the industrial buildings on the Head End Site and potential archeological impacts would not be expected to result in disproportionate impacts on minority and low-income communities since these impacts would affect all populations, including those within potential environmental justice areas and those within non-minority and non-low income communities. In addition, the affected industrial buildings do not represent significant community resources whose loss would affect a potential environmental justice area, including those near the Head End Site. Therefore, the loss of these industrial buildings and certain archeological resources would not be expected to result in any significant adverse burden on potential environmental justice areas.

Construction-related noise impacts would temporarily affect one non-minority and non-low-income area. As discussed in Chapter 23, “Mitigation,” there are no feasible and practical mitigation measures that would be effective in reducing the amount of construction noise at these locations.

The additional burden of historic and cultural resources impacts on the potential environmental justice areas surrounding the Head End Site and temporary construction-related noise impacts on one non-environmental justice area near the Head End Site are not expected to be significant, given that these impacts would be limited and minimized to the greatest extent practicable, and existing burdens in the study area, such as the presence of vacant, underused industrial and manufacturing buildings and potentially contaminated properties, are expected to improve in the future analysis year. ✷

Chapter 22: Alternatives

A. INTRODUCTION

This chapter considers alternatives to the Gowanus Canal Combined Sewer Overflow (CSO) Facilities project. Following the guidelines of the 2014 *City Environmental Quality Review* (*CEQR) Technical Manual*, the purpose of an alternatives analysis is to examine reasonable and feasible options that may avoid or reduce project-related significant adverse impacts while still achieving the stated goals and objectives of the Project. In most cases, a No Action Alternative (i.e., examining the impacts of not undertaking the action being reviewed) must be included in an Environmental Impact Statement (EIS). However, as discussed in Chapter 1, "Project Description," since the Record of Decision (USEPA ROD) requires the City to construct two CSO facilities, a No Action Alternative is not evaluated as part of the EIS.

This chapter considers two alternatives as follows:

- Head End Facility Alternative Site (referred to as the Park Property Alternative): Locating the Head End Facility on a portion of the Thomas Greene Playground (see **Figure 22-1**). As discussed in Chapter 1, "Project Description," under the Settlement Agreement[1] issued by the U.S. Environmental Protection Agency (USEPA) directing the New York City Department of Environmental Protection (DEP) to construct the Head End Facility, if the land at the preferred location (Block 418, Lot 1 and Block 411, Lot 24; referred to as the Head End Canal-side Property) cannot be acquired within the allotted timeframe, USEPA may direct that the Head End Facility be constructed at the Thomas Greene Playground, located to the east of the Head End Site across Nevins Street (Block 419, Lot 1; referred to as the Park Property). Under this alternative, the Head End Facility would not be constructed at the Head End Canal-side Property, but would instead be constructed on the western portion of the Park Property (see **Figure 22-2**). As with the Project, to support the construction for the Park Property Alternative, DEP would lease or acquire the property at 270 Nevins Street (Block 425, Lot 1) to use as a construction staging area. There would be no changes to the Owls Head Facility or to the Gowanus Canal sewershed under this alternative.
- Owls Head Facility Alternative Site (referred to as the 6th Street Alternative): Locating the Owls Head Facility along 6th Street on Block 979, Lots 18 and 23 (see **Figure 22-3)**. The City conducted a Siting and Planning Study to examine alternative locations for a CSO tank to satisfy the USEPA ROD mandate. The City's Siting and Planning Study[2] recommended that the CSO tank be at the preferred location. The Siting and Planning Study also considered, but rejected, an alternative location for the Owls Head Facility to the east of the Owls Head Site along 6th Street (Block 979, Lots 18 and 23; referred to as the 6th Street Property). There would be no changes to the Head End Facility or the

[1] Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery, June 9, 2016, USEPA.

[2] CSO Facility Site Recommendation Report for Owl's Head Outfall OH-007, Gowanus Canal, Brooklyn, New York, DEP, June 2015.

Gowanus Canal
Head End Facility Alternative Site
Park Property Alternative
Outfall Locations
In-street Sewer Line Improvements
*RH-034 Construction Staging Area**

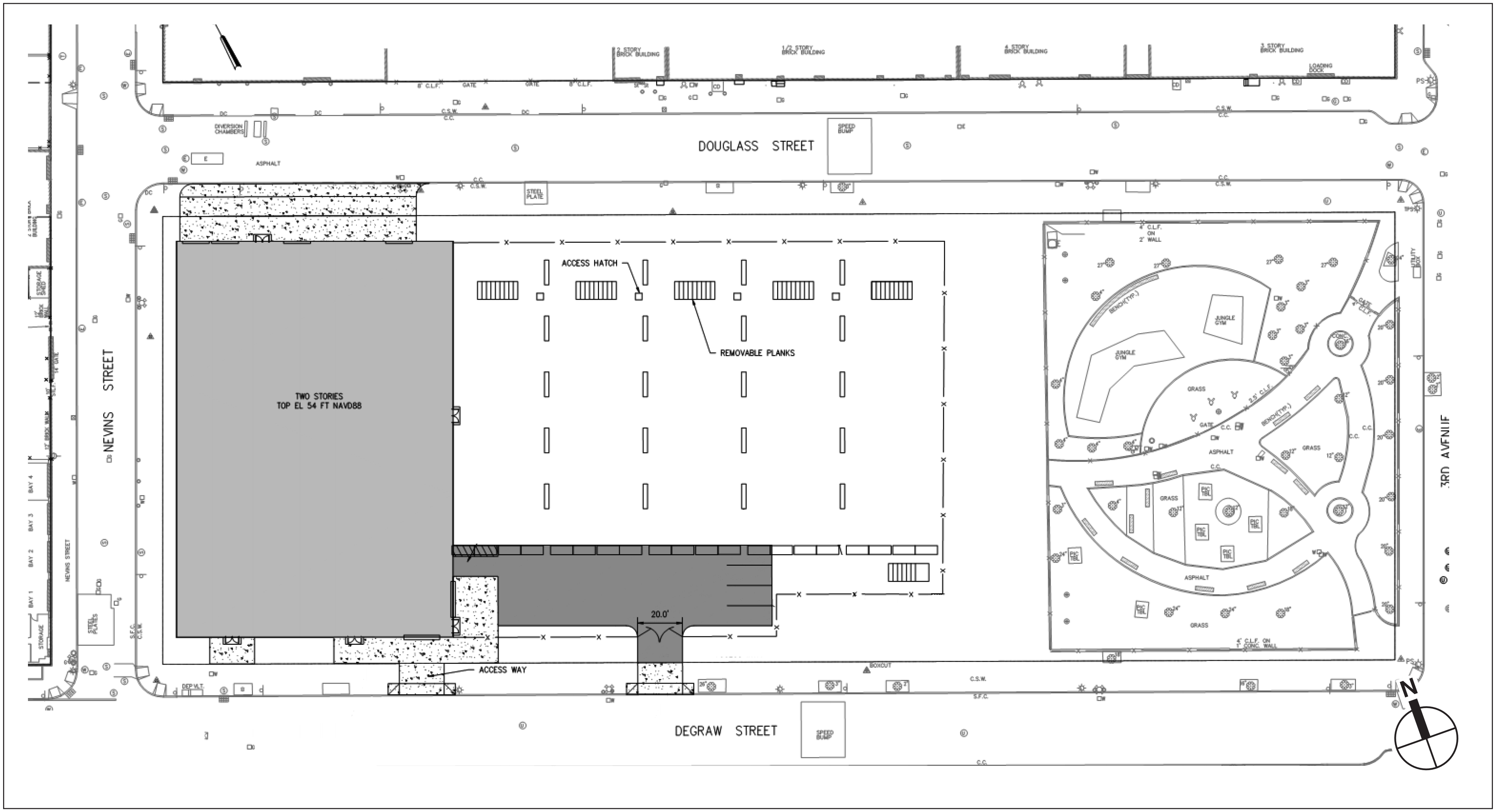
Gowanus Canal CSO Facilities

**NOTE: RH-034 Construction Staging Area Property would be used for both the Project and the Park Property Alternative*

0 500 FEET

Head End Facility Alternative Site
Figure 22-1

5.23.17



Park Property Alternative-Facility Site Plan

Gowanus Canal CSO Facilities

Figure 22-2

Gowanus Canal CSO Facilities

Owls Head Facility Alternative Site

Figure 22-3

Gowanus Canal sewershed under this alternative. Unlike the Head End Site, the City is not under a USEPA order directing the City to construct the Owls Head tank at the preferred alternative.

B. HEAD END FACILITY ALTERNATIVE SITE (PARK PROPERTY ALTERNATIVE)

This section considers the potential impacts of locating the Head End Facility at an alternative location within the western portion of Thomas Greene Playground immediately to the east of the Head End Site (the Park Property), as shown on **Figures 22-1 and 22-2**. Along with the Head End Canal-side Property, the Park Property was considered as an alternative potential site for the Head End Facility in the Siting and Planning Study prepared by DEP in response to the USEPA ROD. The Study evaluated the two sites using a side-by-side comparison of engineering requirements, environmental issues, sustainability considerations, and costs. The outcome of the comprehensive analysis of the two sites was the recommendation to use the Head End Canal-side Property, comprised of two privately owned parcels located at 242 Nevins Street and 234 Butler Street. DEP submitted a Site Recommendation Report to USEPA recommending the Head End Canal-side Property as the preferred location for the Head End Facility. This report also recommended the privately owned parcel at 270 Nevins Street for construction staging for either construction of the Head End Facility at the preferred location or the alternative location at the Park Property.

As discussed in Chapter 1, “Project Description,” under a New York State Department of Environmental Conservation (NYSDEC) Record of Decision administered in July 2015 (NYSDEC ROD), the investigation and remediation of upland sources of contamination relating to the former Fulton Municipal Works manufactured gas plant (MGP) site are currently being addressed pursuant to administrative orders under the jurisdiction of NYSDEC in coordination with the remediation required under CERCLA. The Park Property is within National Grid’s NYSDEC-directed Remedial Investigation study area. Pursuant to the NYSDEC ROD, National Grid may be required to undertake remediation activities within the Park Property. The location, phasing, and schedule of the remediation activities are not known at this time. However, according to the Settlement Agreement issued on June 9, 2016 by USEPA, a timely removal action must be implemented at the Thomas Greene Playground if USEPA requires the City to build a CSO Facility at that location. For the purposes of this assessment, it is assumed that any remediation activities undertaken by National Grid on the Park Property would be completed prior to the construction of the facility under the Park Property Alternative. In addition, under the Settlement Agreement, National Grid would be required to site and construct a temporary park pursuant to a future enforcement order between USEPA and National Grid, and in coordination with NYSDEC (the location of the temporary park is not known at this time). This alternative assumes that a temporary park would be sited and constructed by National Grid prior to the construction of the Park Property Alternative.

In addition, under this alternative, it is assumed that there would be no change to the Owls Head Facility; therefore, there would be no change to the analysis conclusions concerning the Owls Head Facility.

DESCRIPTION OF THE PARK PROPERTY ALTERNATIVE

Under this alternative, a facility similar to the Head End Facility would be constructed at the Park Property. This alternative’s 8-million-gallon (MG) tank would have a different orientation and depth and would be constructed and operated to intercept overflow of CSO solids upstream of CSO outfall RH-034. The facility under this alternative would be located on the western end of the site (see **Figure 22-2**), in a portion of Thomas Greene Playground that currently contains a public pool, handball courts, and basketball courts. Influent wet weather flows would be diverted from the existing sewers through new infrastructure required to convey flow to this facility. Flows would be captured in an approximately

43,225-square-foot (sf) below-grade structure containing the 8-MG tank and tank system. In addition to the below-grade structure, the facility under this alternative would include an approximately 25,700-sf, two-story above-grade structure located at the western end of the site along Nevins Street, similar to the above-grade structure that would be constructed with the Head End Facility, which would house the screening equipment, electrical equipment, an odor control system, an emergency generator, and crew areas. Under this alternative, the orientation of the above-grade structure combined with the access requirements for the below-grade structure would limit available space and options for replacing existing park programming. It is assumed that only some of the displaced facilities within the existing Thomas Greene Playground (the pool, handball courts, and basketball courts) would be reconstructed on the Park Property above and next to the below-grade structure. As discussed further below, although some elements of the Park would be reconstructed, locating the CSO facility in the Thomas Greene Playground would result in the loss of the parkland and may require alienation legislation.

The Park Property Alternative would receive flows from the portion of the sewer system that would also send flows to the Head End Facility. Unlike the Head End Facility, flows from the three major sewers connecting to the Gowanus Wastewater Pumping Station and outfall RH-034 would be directed to the facility upstream of the overflow point, requiring a new conduit to be constructed along Butler Street, modifications to existing sewers (on Butler Street and Nevins Street north of Butler Street), and construction of a diversion structure at the intersection of Butler Street and Nevins Street. Similar to the Head End Facility, flow would also be diverted from the four neighboring outfalls (RH-033, RH-036, RH-037, and RH-038) located near RH-034 along the northeast bank of the Canal to the facility. As with the Head End Facility, sewer line improvements would be required along Nevins Street from Sackett Street to Butler Street to connect regulators RH-033, RH-036, RH-037, and RH-038. In addition, similar to the Head End Facility, the Park Property Alternative would convey excess flows to outfall RH-038, located at the end of Degraw Street; however, unlike the Head End Facility, the Park Property Alternative would require utility relocations and construction of new infrastructure for the effluent channel to be constructed along Degraw Street extending west of Nevins Street.

Due to the distance between the Park Property and the RH-034 regulator, this alternative's tank would need to be constructed at a greater depth (elevations of -21.0 to -23.0 feet NAVD88) than the Head End Facility's tank (elevations of -19.0 to -21.0 feet NAVD88) to provide proper hydraulic operation. Furthermore, the tank depth would be deeper to minimize the footprint and allow for space to accommodate a replacement pool on site. Unlike the Head End Facility, where the influent and effluent conveyance construction is contained within the site, the Park Property Alternative would require longer and deeper conveyance conduits and diversion structures (described above) to be constructed in active roadways. At this time, the extent of utility relocations required to accommodate construction of the conduits and diversion structures is not clear, but it would likely extend the duration of this work. For example, while the Head End Facility would only require approximately 200 feet of influent conveyance to connect to regulator RH-034, the Park Property Alternative would require approximately 1,200 feet of conveyance to connect to regulator RH-034.

Operations with the Park Property Alternative would be similar to operations of the Head End Facility, including screening of influent flows to remove large debris, storage in the tanks until there is sufficient downstream capacity to convey the stored flow to the Red Hook WWTP, pump-back of the flow from the tanks, flushing of accumulated solids in the storage cells, and degritting (see Chapter 1, "Project Description," for a full description of the facility systems and operations).

As this alternative would result in a similar CSO control facility as the Head End Facility, which would result in similar operational effects (e.g., similar worker trips, energy consumption, and solid waste generation), this alternative would not result in any significant adverse impacts in the following technical areas: solid waste and sanitation services, energy, transportation, and greenhouse gas emissions and climate change. In the remaining technical areas, the alternative location for the facility may result in new or different effects as compared with the Head End Facility (e.g., displacement of different uses); therefore, additional analyses in these areas are warranted, and are presented below.

LAND USE, ZONING, AND PUBLIC POLICY

Similar to the Head End Facility, this alternative would be located in an area that primarily contains sewer infrastructure and warehouse, light manufacturing, and shipping facilities, as discussed in Chapter 2, "Land Use, Zoning, and Public Policy." The facility under the Park Property Alternative would be similar to and compatible with these uses; however, it would result in the displacement, both temporarily during construction, as well as permanently during operation, of a portion of Thomas Greene Playground. This change in land use is used to determine whether there would be significant adverse impacts in other technical areas (e.g., open space).

In its current condition, the Park Property is not subject to zoning regulations (as such regulations are inapplicable to public parkland under the jurisdiction of the New York City Department of Parks and Recreation [NYC Parks]). However, in accordance with the New York City Zoning Resolution (ZR), as part of the transfer of the property to DEP for construction of the CSO facility under the Park Property Alternative, the property would need to be given a zoning designation[3]. (For the purposes of this assessment, it is assumed that the property would be designated an M2-1 district, similar to the Head End Site. As with the Head End Facility, this alternative would be considered a permitted use in an M2-1 zoning district (Use Group 18), and would be designed to meet all applicable zoning requirements. The Park Property is also located within the boundaries of the Coastal Zone, and this alternative would not affect the Project's consistency with the policies of the Waterfront Revitalization Program (WRP), with the exception of WRP Policy 8 relating to the provision of public open space in the waterfront area; specifically, unlike the Project, this alternative would be inconsistent with WRP Policy 8 as it would not include new public open space, but would rather result in the direct displacement of an open space area (a portion of the Thomas Greene Playground, discussed below) (see Chapter 2, "Land Use, Zoning, and Public Policy").

SOCIOECONOMIC CONDITIONS

Unlike the Project, this alternative would not require the use of Block 418, Lot 1 and Block 411, Lot 24 for installation of the CSO tanks, and therefore, would not require the displacement of uses located on these two lots. Instead, the tanks would be located within the Thomas Greene Playground immediately to the east of the Head End Site. Currently, Block 418, Lot 1 and Block 411, Lot 24 are estimated to house 10 of the 19 businesses and 104 of the 184 employees that would be displaced by the Project. The Park Property Alternative would therefore displace fewer businesses (9 as compared to 19) and fewer employees (80 as compared with 184) than the Head End Facility. As with the Project, the Park Property Alternative would result in the displacement of the Eastern Effects studio facility on Block 425, Lot 1, as this site would also be used as a construction staging area. As discussed in Chapter 3, "Socioeconomic

[3] ZR Section 11-13: "In the event that a public park or portion thereof is sold, transferred, exchanged or in any other manner relinquished from the control of the Commissioner of Parks and Recreation, no building permit shall be issued, nor shall any use be permitted on such former public park or portion thereof, until a zoning amendment designating a zoning district therefore has been adopted by the City Planning Commission and has become effective after submission to the City Council in accordance with the provisions of Section 71-10."

Conditions," the displacement of businesses by the Project would not significantly affect business conditions in any industry or any category of business within or outside the study area; therefore, the Project would not result in any significant adverse socioeconomic impacts.

Similar to the Project, the direct business displacement associated with the Park Property Alternative would not result in significant adverse impacts on socioeconomic conditions. Since the CSO facility location would not cause the displacement of any businesses, it would neither affect the customer base of local businesses, nor would it directly or indirectly displace workers who form the customer base of existing businesses in the area. The alternative therefore would not result in significant adverse impacts on socioeconomic conditions due to indirect business displacement.

Like the Project, the Park Property Alternative would not directly displace any residential uses and would not introduce any commercial development that could cause indirect residential displacement due to increased rents. Therefore, as with the Project, this alternative would not have a significant adverse impact on socioeconomic conditions.

COMMUNITY FACILITIES

The Park Property Alternative would not have a direct effect on community facilities (i.e. schools, child care centers, libraries, health care facilities, and fire and police protection services) because it would not physically displace any community facilities (the public pool within Thomas Greene Playground that would be displaced by this alternative is discussed below, under "Open Space"). As with the Project, this alternative would not result in new residential development and would not introduce a new residential population that could result in indirect effects by increasing demand for community facility services. Therefore, as with the Project, this alternative would not have a significant adverse impact on community facilities.

OPEN SPACE

Unlike the Project, this alternative would result in the permanent displacement of a portion of publicly accessible open space in the Thomas Greene Playground. In particular, this alternative would result in the direct displacement of approximately one third of the Thomas Greene Playground, an area that contains a public pool, handball courts, and basketball courts. As stated above, DEP would seek to reconstruct these facilities to the extent practicable, but it is clear that, due to the space available and access requirements for facility operations, all of the existing programming would not be replaced. In addition to the permanent closure of the western portion of the Thomas Greene Playground for the CSO facility, the remaining eastern portion of the park, which contains a playground and seating areas, may need to be closed to the public for extended periods during construction of the CSO facility (in addition to the closures that may be required absent the Project for National Grid's remediation of the Park Property, discussed in Chapter 5, "Open Space"). However, the eastern portion of the park would not be permanently directly displaced and would be available for use during operation of the CSO facility. As noted in Chapter 5, there are few other open space resources within the Gowanus neighborhood; open space is generally limited to a waterfront public access area at the Whole Foods Market to the south of the Park Property, open spaces on the New York City Housing Authority (NYCHA) Gowanus Houses residential complex on the west side of the Canal, and several small parks and community gardens. Therefore, the permanent displacement of certain of the active recreation areas within Thomas Greene Playground for operation of this alternative, beyond the temporary displacement resulting from National Grid's remediation of the property, would result in a significant loss of recreational resources for area residents.

According to the *CEQR Technical Manual*, displacement of open space resources is considered a significant adverse impact unless a project can provide a comparable replacement open space in terms of size, usability, and quality within a study area. Although some elements of the Thomas Greene Playground would be reconstructed, locating the CSO facility in the park would result in the loss of parkland, therefore, unlike the Project, this alternative would result in a potential significant adverse impact to open space. DEP is evaluating options to mitigate this potential impact; the loss of parkland may also require legislation for alienation of parkland. Temporary impacts on the Thomas Greene Playground resulting from construction of the Park Property Alternative are discussed below, under "Construction."

SHADOWS

The above-grade structure on the Park Property in this alternative would be located too far away from the Canal for its shadows to reach it at any time of day, in any season. Consequently, unlike the Project, this alternative would not result in any new shadows on the Canal.

However, as described above, in this alternative the above grade structure would be located within the park. The park and the surrounding street grid are oriented roughly along a northwest to southeast axis, and the superstructure would be on the northwest end. The reconstructed park area would abut the above-grade structure and extend to the southeast through the middle of the block, and the existing park would remain on the southeastern third of the block. The above-grade structure of the facility under the Park Property Alternative would cast shadows in the afternoon, but not in the mornings, in all seasons. In winter, when days are shorter than in other seasons, the afternoon shadows fall to the northeast at the end of the day, and would not extend farther east as in other seasons. These project-generated shadows would not cover a large area of the park, even at their maximum extent. In the early spring and fall, when days are longer, shadows extend farther to the east in the late afternoon, and in late spring and summer, when days are longest, shadows fall to the east during the afternoon and to the southeast near the end of the day. Therefore, in the spring and summer, substantial project-generated shadows would fall on the park, likely altering the character and usability of the space, particularly if the shaded area were to contain seating areas, wading or swimming pools or sprinklers, or planted areas. Consequently this alternative would likely cause potential significant adverse shadow impacts to this park. Potential measures that could partially mitigate the significant adverse impact include programming the reconstructed park so that shade-tolerant species of plants are located in the affected area and locating uses that are more sensitive to shadows, such as seating, beyond the affected area. However, given that any above-grade structure on the Park Property would cast substantial shadows on the adjacent park area; the potential significant adverse shadows impact resulting from this alternative cannot be fully mitigated.

HISTORIC AND CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

The Park Property is located immediately adjacent to and outside of the study area examined for the previous large-scale archaeological surveys of the Gowanus Canal discussed in Chapter 7, "Historic and Cultural Resources." Although the Park Property itself was not included in previous archaeological assessments, those earlier studies provide relevant information regarding the potential archaeological resources located within the Park Property. A review of historic maps was completed as part of this analysis to provide information regarding the likely current condition (integrity) of the potential resource.

Similar to the Head End Site, the Park Property is considered to be potentially sensitive for the presence of prehistoric resources that could underlay the mid-19th century landfill deposits that followed construction of the Gowanus Canal and features associated with mid-19th through early 20th century industrial activity, however, these were determined to be of low integrity as a result of development-related disturbance across the site. Intensive development of the Park Property as an MGP beginning in the late 19th century has likely diminished the integrity of any archaeological resources located on the site. In addition, remediation activities undertaken by National Grid on the Park Property independently would also affect any archaeological resources present. As described in Chapter 7, "Historic and Cultural Resources," based on the results of the previous surveys, portions of the Nevins Street streetbed are considered to be highly sensitive for both prehistoric resources and resources associated with 18th century settlement (tidal mill complex) although those resources are believed to have low integrity given the extent to which the streetbed has been disturbed as a result of subsequent development. Construction of existing infrastructure beneath the Nevins Street streetbed has also likely affected any prehistoric resources and remains of 18th century settlement.

While it is not likely, if archaeological resources are present in the Park Property and retain both integrity and significance, this alternative, as with the Project, would result in a significant adverse impact on archaeological resources. Impacts would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with the New York State Historic Preservation Office (SHPO) and New York City Landmarks Preservation Commission (LPC).

ARCHITECTURAL RESOURCES

Unlike the Project, the Park Property Alternative would not require the demolition of the buildings at 242 Nevins Street and 234 Butler Street, which contribute to the significance of the State/National Register (S/NR)-eligible Gowanus Canal Historic District. However, as with the Project, the Park Property Alternative would require the demolition of the building at 270 Nevins Street, which also contributes to the significance of the S/NR-eligible Gowanus Canal Historic District, for use of the site as a construction staging area; demolition of this building would constitute a significant adverse impact to an architectural resource and to the S/NR-eligible Gowanus Canal Historic District. Therefore, this alternative would result in a similar significant adverse impact to architectural resources, although there would be a reduced impact as potential demolition would be limited to 270 Nevins Street. As discussed in Chapter 7, "Historic and Cultural Resources," DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings on the Head End Site, including 270 Nevins Street. As with the Project, if feasible, DEP would preserve the building or portions of the building. If not feasible, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the building as per recordation standards determined in consultation with SHPO and USEPA.

The Thomas Greene Playground is located outside the boundaries of the S/NR-eligible Gowanus Canal Historic District and there are no architectural resources on the Park Property. The Thomas Greene Playground was initially constructed in the 1930s[4] and the pool was added in the early 1970s.[5] The park was renovated in 1998, with renovations including new play equipment, safety surfacing, and the addition of handball courts. The eastern portion of the park (the play area and landscaped seating area) was

[4] "Thomas Greene Playground," NYC Department of Parks and Recreation, accessed July 24, 2017 (https://www.nycgovparks.org/parks/thomas-greene-playground/history).

[5] "History of Parks' Swimming Pools," NYC Parks, accessed July 24, 2017 (https://www.nycgovparks.org/about/history/pools).

renovated in 2015. The buildings at the park consist of a number of small pool and park related buildings that do not possess distinguishing architectural or historic characteristics.

Construction at Thomas Greene Playground, including the two-story above-grade structure that would be located along Nevins Street, would occur within 90 feet of the buildings at 242-244 Nevins Street and 234 Butler Street. Therefore, DEP would develop and implement a Construction Protection Plan (CPP) to avoid construction related impacts to these buildings. This CPP would be developed in consultation with LPC and SHPO and prepared as set forth in Section 523 of the *CEQR Technical Manual* and in compliance with the procedures included in the New York City Department of Building's (DOB) Technical Policy and Procedure Notice (TPPN) #10/88. Although properties in the S/NR-eligible Gowanus Canal Historic District are located across Degraw and Douglass Streets from the Park Property, none of these buildings are architecturally distinguished or contain significant architectural features or ornament. Consultation is being undertaken among DEP and SHPO to determine what protection measures may be needed for these properties during construction of the Project; similar measures would be implemented under this alternative.

The new conduits on Butler and Nevins Streets would be constructed within 90 feet of 242-244 Nevins Street and 234 Butler Street. The conduits would also be constructed within 90 feet of properties that have been identified as individually S/NR-eligible, including the Gowanus Pumping Station, the ASPCA Memorial Building and the Former R.G. Dunn and Company Building on Butler Street, similar to the potential in-street sewer line improvements for the Head End Site. Therefore, consultation is also being undertaken with SHPO to determine what additional protection measures may be required for these S/NR-eligible properties with the Project, if any, to supplement standard DEP procedures for undertaking in-street construction; similar measures would be implemented under this alternative.

URBAN DESIGN AND VISUAL RESOURCES

Construction of this alternative would result in the displacement of portions of Thomas Greene Playground that contain primarily paved areas (including ball courts) surrounded by walls and chain link and other metal fencing, as well as a pool and several one-story structures (the changing areas for the pool). Construction of this alternative would also result in the removal of approximately 10 to 15 street trees, including mature London Plane trees. The paved areas, structures on this portion of the park, and street trees are not significant natural or built features that constitute visual resources as defined by *CEQR Technical Manual* guidelines. Therefore this alternative would not result in the removal of any significant visual resources; however, while the mature street trees are not defining features of the visual environment, their removal would detract from the pedestrian experience and the visual condition of the streetscape. As with the Head End Facility, the Park Property Alternative is anticipated to comply with applicable zoning regulations regarding bulk and built form, and would result in physical and visual changes consistent with zoning regulations applicable to the area. Therefore, as with the Project, this alternative would not result in a significant adverse impact to urban design and visual resources. However, unlike the Project, this alternative would not enhance the pedestrian experience near the Canal, as it would neither remove the existing structures and manufacturing facilities on the Head End Site that limit visual access to the Canal, nor would it provide new waterfront public access areas and/or new public amenities.

NATURAL RESOURCES

The western portion of Thomas Greene Playground, where this alternative would be located, includes a public pool, handball courts, and basketball courts. Vegetation within this portion of the park is generally limited to London plane trees (*Platanus acerifolia*) within street tree pits. The western portion of Thomas

Greene Playground would be best characterized as a paved road/path[6] ecological community. The eastern portion of Thomas Greene Playground would best be characterized as a mowed lawn with trees[7] ecological community, dominated by London plane tree and Kentucky bluegrass (*Poa pratensis*). Construction for the Park Property Alternative would require the removal of trees within the limit of disturbance. However, all work would be performed in compliance with Local Law 3 of 2010 and the NYC Parks Tree Protection Protocol. Any required replacement and/or restitution would be provided in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York.

Thomas Greene Playground and the surrounding area are subject to high levels of human disturbance and provide habitat to only the most disturbance-tolerant wildlife species. Similar to the Project, construction for the Park Property Alternative would likely result in the temporary displacement of wildlife; however, similar habitat is available in the vicinity of the study area and the temporary disturbance of individuals of urban tolerant species would not result in significant adverse impacts to wildlife resources. Therefore, this alternative would not result in significant adverse impacts to terrestrial resources or habitats within the limit of disturbance and the surrounding area.

Unlike the Head End Facility, the facility under the Park Property Alternative would be located inland from the Canal by approximately 250 feet, and would not be located within a mapped wetland area. Common to both the Head End Facility and the Park Property Alternative, modifications to outfall RH-038, if required, could result in potential disturbances to DEC littoral zone tidal wetland within the canal. Such work would be performed in conformance with the Stormwater Pollution Prevention Plan (SWPPP) and any other U.S. Army Corps of Engineers (USACE) or NYSDEC regulatory requirements or their equivalents to prevent and minimize indirect impacts to wetlands (see Chapter 9, “Natural Resources”).

Although a portion of the Park Property is located within the 100-year floodplain (Zone AE) and the 500-year floodplain (shown on Figure 9-1 in Chapter 9, “Natural Resources,”), the floodplain within and adjacent to the Park Property would not be affected by construction or regrading/filling associated with this alternative. Within New York City, coastal flooding is the primary cause of flood damage. Coastal floodplains are influenced by astronomic tide and meteorological forces (e.g., nor’easters and hurricanes) rather than local flooding caused by precipitation (Federal Emergency Management Agency [FEMA] 2013). Therefore, the occupancy of the floodplain by the Park Property Alternative would not affect the flood elevation or increased risks due to flooding in the vicinity of Park Property. Once operational, as with the Head End Facility, the Park Property Alternative would reduce the number of CSO events. Therefore, as with the Project, this alternative would not result in any significant adverse impacts to natural resources.

HAZARDOUS MATERIALS

This alternative would entail extensive excavation and dewatering for construction. As noted above, the Park Property, like the blocks to the west and southwest, was a part of the former Fulton Municipal Works MGP. The southern portion of the block was used for petroleum storage and manufactured gas storage for the MGP operations. A wagon house/garage occupied the eastern portion and the northern

[6] Edinger et al. 2014 describes this ecological community as “a road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface.”

[7] Edinger et al. 2014 describes this ecological community as “residential, recreational, or commercial land in which the groundcover is dominated by clipped grasses and forbs, and it is shaded by at least 30 percent cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50 percent cover. The groundcover is maintained by mowing and broadleaf herbicide application.”

portion was used primarily for gas piping lay-down/support area. Unidentified storage tanks were present on the northwestern portion of the block.

As noted above, the Park Property is within National Grid's NYSDEC-directed Remedial Investigation study area, and National Grid would be required to undertake remediation activities within the Park Property prior to the construction of this alternative. Two studies of the Park Property have been undertaken:

- National Grid conducted a Remedial Investigation (RI) of the Park Property in 2012 which included laboratory analysis of soil (and groundwater) samples collected from 33 soil borings and 5 test pits on this block and an additional 12 borings in the north- or south-adjacent street beds or sidewalks. No significant contamination was found in surface soils, but historical fill material was present, as anticipated. Results from shallow subsurface soil were similarly consistent with historical fill material, rather than MGP-related contamination; however, petroleum odors were noted in one location. Soils with staining and sheens that exhibited petroleum and diesel-like odors were encountered between approximately 5 and 20 feet below grade in multiple borings and test pits. The shallowest tar-related impacts were encountered at approximately 7 feet below grade, but tar was encountered primarily between 20 and 60 feet below grade and in one boring extended to more than 100 feet below grade.
- In March 2017, Brown and Caldwell conducted a Pre-Design Investigation which included the installation of 24 soil borings and collection of 20 groundwater samples within or immediately adjacent to the Park Property. Consistent with the 2012 RI, tar or tar stained soils were not encountered in shallow soils, but were encountered in many of the borings, as shallow as approximately 10 feet below grade and at deep as more than 100 feet below grade. Analytical data for the soil samples revealed elevated levels (i.e., above 6 NYCRR Part 375 Commercial Soil Cleanup Objectives) of benzene, toluene and ethylbenzene, naphthalene, various polycyclic aromatic hydrocarbons (PAHs), and the metals arsenic, barium, copper, lead and mercury, all consistent with historical MGP use. Lead was also identified exceeding the USEPA Resource Conservation and Recovery Act (RCRA) limit for hazardous waste in two soil boring locations. In the absence of a likely source for this lead, it is assumed to be related to historical fill material. Analytical data for the groundwater samples revealed elevated levels (i.e., above 6 NYCRR Parts 700-706 Ambient Water Quality Standards, i.e., drinking water standards) of VOCs (notably benzene, toluene, ethylbenzene, and xylenes), naphthalene, various PAHs, and metals (notably barium and lead), all consistent with historical MGP use and historical fill material.

When compared with the Head End Canal-side Property, the Park Property has similar types of contamination (i.e., primarily MGP-related) but the contamination is more extensive (e.g., more evidence of NAPL/tars was identified in borings). The same procedures to avoid the potential for adverse impacts would be needed in the construction area in advance of and/or during construction, as it is anticipated that the excavation depth for the construction of this alternative would extend deeper than the remediation that is expected to be undertaken by National Grid pursuant to the NYSDEC ROD, and that there is additional MGP-related contamination beyond the likely depth of National Grid's remediation. These procedures are discussed in Chapter 10, "Hazardous Materials." The work would require coordination with USEPA, NYSDEC, and National Grid to ensure that the design and construction associated with the Park Property Alternative would properly address the full extent of hazardous materials conditions and include all appropriate measures to avoid adverse environmental impacts from hazardous materials.

WATER AND SEWER INFRASTRUCTURE

Similar to the Head End Facility, this alternative was analyzed to determine the projected reduction of CSO as well as the potential effects on wastewater treatment and conveyance infrastructure, in particular potential increases in surcharge within the collection system and flooding upstream of the facilities, utilizing the InfoWorks Integrated Catchment Model described in Chapter 11, "Water and Sewer Infrastructure." The 8-MG CSO tank under the Park Property Alternative would result in a reduction of CSO equal to that of the CSO Facility for the Project at the Head End Site (an estimated 76 percent reduction on a volume basis, and a similar or increased reduction in loads based on Total Suspended Solids load reduction modeling), and would therefore meet or exceed the USEPA ROD goals for CSO solids reduction.

Pump-back flows from the facility under the Park Property Alternative would also be similar to that of the Head End Facility, and could readily be accommodated by the Red Hook WWTP based on its available capacity (described in Chapter 11). This alternative has also been designed to maintain hydraulic neutrality: the elevation of 3.9 feet NAVD88 that has been established as the hydraulic neutrality elevation at the existing RH-034 regulator was used as the trigger elevation for the bending weir system directing flow to the Park Property Alternative. Conditions that cause the hydraulic grade to rise higher than 3.9 feet NAVD88, such as storm events that result in flows to the facility exceeding its capacity and/or high tide conditions in the Canal, would result in the tipping of the bending weir, allowing the flow to bypass the facility and discharge directly to the Canal without resulting in upstream surcharge. Therefore, as with the Project, this alternative would provide CSO solids reductions meeting the goals of the USEPA ROD. In addition, it would not adversely affect wastewater treatment performance or sanitary and stormwater drainage and management.

AIR QUALITY

As discussed above, the major components and operations under the Park Property Alternative would be similar to those identified at the Head End Facility. The two-story above-grade structure would be similar to the above-grade structure for the Head End Facility, and would be located at the western end of the site along Nevins Street. As in the Head End Facility, the above-grade structure would house similar HVAC equipment, odor control systems, and an emergency generator. As compared to the Head End Facility, the Park Property Alternative would have the potential to affect different receptor locations in the area. The nearest receptor locations to the Park Property are the publicly accessible open space receptors within the eastern portion of the Thomas Greene Playground and adjacent to the CSO facility. Additionally, there would be nearby elevated receptors directly to the north of the facility to conservatively evaluate the effect on potential future land use changes. Under this alternative, there would not be any open space receptors on the far western portion of the park (as this is the area that would be displaced for construction of the CSO facility) or at the Head End Site (as there would be no publically accessible open space created on this site). Unlike the Project, the Park Property Alternative would be located further from the planned future hotel located at 239 Butler Street.

While the location and orientation of sources and receptors would differ from the analysis performed for the Head End Facility, relative distances between sources and receptors would be similar for the Park Property Alternative, including the immediately adjacent open space receptors. Therefore, predicted concentrations would be similar to those identified for the Head End Facility, and this alternative is not anticipated to result in any significant adverse impacts on air quality.

NOISE

Neither the Project nor the Park Property Alternative would result in significant adverse noise impacts. As with the Project, while traffic volumes would increase in the area due to general background growth, increases in traffic as a result of the Park Property Alternative are not expected to generate sufficient traffic to cause a 3 dBA increase in noise levels (i.e., doubling noise passenger car-equivalents [Noise PCEs]) at any surrounding receptors, which would be considered a significant increase in noise. Likewise, the Park Property Alternative does not include above-ground stationary noise sources that could potentially increase noise levels at surrounding receptors. The building's mechanical systems (i.e., HVAC systems, emergency generators, odor control systems, pumps, etc.) would meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code, the New York City Zoning Resolution [NYCZR] Performance Standards for Manufacturing zones, and the New York City Department of Buildings [DOB] Mechanical Code) and would avoid producing noise levels that would result in any significant increase in ambient noise levels. Further, this equipment would be located either indoors or below grade without line of sight to nearby sensitive receptors. Therefore, existing sensitive receptors are not expected to experience increased noise levels as a result of the Park Property Alternative. Furthermore, the Park Property Alternative would not introduce any new noise sensitive receptors. Therefore, operation of the facility under the Park Property Alternative is not expected to result in a significant adverse noise impact.

NEIGHBORHOOD CHARACTER

The Park Property is adjacent to the Head End Facility and is within the same area that is largely defined by the historic presence of the Canal, which has resulted in primarily industrial and commercial land uses, socioeconomic character, and historic resources. As discussed in Chapter 19, "Neighborhood Character," the Thomas Greene Playground itself is a key open space resource that partly defines the character of the area as well. As compared to the Head End Facility, the Park Property Alternative would not have any direct impact on the architectural resources which partly define the character of the area, since it would not require the demolition of the buildings on the Head End Site. However, the Park Property Alternative would result in a potential significant adverse impact to the Thomas Greene Playground due to the displacement of the western portion of the park. As noted above, DEP is evaluating options to mitigate the significant adverse impact, including potential reconstruction of the displaced facilities to the extent practicable. However, since reconstruction of all existing facilities is not feasible, the Park Property Alternative may result in a significant loss of recreational resources. As with the Project, the CSO facility would be compatible with the other uses within the area, which are primarily warehouse, light manufacturing, or shipping facilities buildings. However, the adverse effect to the Thomas Greene Playground under this alternative could alter the character of the area to a greater extent than the Project.

CONSTRUCTION

The construction phasing and activities for this alternative would be similar to those for the Head End Facility with several notable differences: (1) the tanks would need to be constructed at a greater depth to provide proper hydraulic operation; (2) a new conveyance conduit would need to be constructed at a greater depth and for a longer distance in active roadways which will require additional utility relocation; (3) new diversion structures and upstream sewer modifications would need to be constructed in active roadways requiring additional utility relocations; (4) additional remediation activities may be required due to the more extensive contamination of the Park Property (as compared to the Head End Site); and (5) the alternative would require park reconstruction activities. The overall construction duration for this alternative is expected to be similar to that for the Head End Facility, although the duration of work in active roadways would be longer. However, since National Grid would be required to undertake remediation activities within the Park Property prior to the construction of this alternative, construction of the CSO facility under the Park Property Alternative could be substantially longer. This alternative assumes that a temporary park would be sited and constructed by National Grid prior to the construction of the Park Property Alternative (the location of the temporary park is not known at this time), and this may cause a delay in the construction of the CSO facility under this alternative. The staging area to facilitate the construction activities is anticipated to be at 270 Nevins Street, the same construction staging location as for the Head End Facility. Non-road and on-road construction equipment is expected to be similar to that used for the Head End Facility, however, due to the location of the staging area across Nevins Street, there would be much more activity in the road to move between the park and staging area operations.

The sections below analyze the potential for significant adverse construction-period impacts under the Park Property Alternative in the areas of transportation, air quality, noise and vibration, open space, and the additional technical areas of land use and neighborhood character, socioeconomic conditions, and community facilities and services. The potential for significant adverse construction-period impacts under this alternative in the areas of historic and cultural resources, natural resources, hazardous materials, and water and sewer infrastructure is discussed above in their respective sections.

TRANSPORTATION

This alternative is expected to have a construction vehicular access/egress point along Douglass Street between Nevins Street and 3rd Avenue; this location is different than the construction vehicular access/egress locations that would be used for construction of the Head End Facility along Nevins Street between Douglass Street and Degraw Street and on Degraw Street between Nevins Street and the Canal. In addition to a different construction access/egress location, the Park Property Alternative could require temporary roadway closures during construction. These potential roadway closures may include Degraw Street between the Gowanus Canal and Nevins Street, Degraw Street between Nevins Street and 3rd Avenue, and Nevins Street between Douglass Street and Degraw Street.

Although the overall construction duration for this alternative would be longer than that for the Head End Facility, the peak worker and truck trips during construction under this alternative are expected to be similar to those for the Project. Construction worker automobiles would follow the same trip-making patterns as the Project (60 percent of the trips from Brooklyn, 15 from Queens, 11 from Staten Island, 7 from Long Island, 3 from the Bronx, 3 from New Jersey, and 1 from Manhattan) except that a minor diversion would be needed due to the potential street closure on Nevins Street. With this closure, vehicles that were assumed to park on Nevins Street would shift to adjacent roadways such as Bond Street, Douglass Street, or 3rd Avenue, where there is parking capacity available to accommodate construction worker automobiles. Even with the potential closures in place, construction trucks would follow the same trip-making patterns as the Project, except for inbound truck trips traveling southbound on Nevins Street, which would make a left-turn on Douglass Street to access the Park Facility Site. Similarly, outbound truck trips traveling southbound on Nevins Street would use Douglass Street to access 3rd and 4th Avenues instead of using Sackett Street to access 3rd and 4th Avenues. The existing hourly traffic background volumes along the roadways with potential closures are low, with an average of 20 vehicles on Degraw Street between the Gowanus Canal and Nevins Street, 40 vehicles on Degraw Street between Nevins Street and 3rd Avenue, and 125 vehicles on Nevins Street between Douglass Street and Degraw Street. If roadway closures are required during construction, these existing vehicles would be diverted to surrounding corridors.

These potential closures would also be evaluated considering options to maintain roadway access in lieu of full roadway closures, such as maintaining access to existing businesses and other area land uses, and the employment of flaggers to control traffic in and out of the construction area. Roadway closures that occur for up to 180 days are considered short-term roadway closures, while continuous roadway closures that exceed 180 days are considered long-term roadway closures. Although it is likely that any roadway closures during construction would be temporary in nature and would not exceed 180 days it is possible that long-term roadway closures may be required under the Park Property Alternative.

As with the Project, Maintenance and Protection of Traffic (MPT) plans would be developed for any required temporary sidewalk, lane, and/or street closures to ensure the safety of the construction workers and the public passing through the area. Approval of these plans and implementation of the closures would be coordinated with the New York City Department of Transportation (NYCDOT)'s Office of Construction Mitigation and Coordination (OCMC). Measures specified in the MPT plans that are anticipated to be implemented may include but are not limited to the following: sidewalk closures; curbside moving lane closures; safety signs; safety barriers; and construction fencing.

Peak construction trip increments and trip-making patterns for construction workers and construction trucks would be very similar to the Project and the existing background traffic volumes along the roadway with potential closures are low. If the potential roadway closures under this Alternative are short-term, it is expected that like the Project, the Park Property Alternative would not result in any significant adverse transportation impacts during construction. However, as discussed above, if such closures exceed 180 days, then the Park Property Alternative may result in worse effects on area traffic during construction.

AIR QUALITY

Although the overall construction duration for this alternative would be longer than that for the Head End Facility, the construction activities for the Park Property Alternative and the equipment used to construct the facility are expected to be similar to those for the Head End Facility. Like the Project, measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes, including dust suppression measures and idling restrictions. In addition, like the Project, construction under this alternative is subject to New York City Local Law 77, which requires the use of ultra-low sulfur diesel (ULSD) fuel and Best Available Technology (BAT) for equipment at the time of construction. With the emissions reduction measures in place, the construction activities under this alternative would be similar to that for the Project and the proximity of construction activities to nearby sensitive receptor locations would also be similar to the Project; therefore this alternative would not be expected to result in significant air quality impacts during construction.

NOISE

Similar to the Project, the maximum predicted noise levels as a result of the Park Property Alternative would occur during the most noise-intensive activities of construction such as support of excavation (SOE) and site excavation, which would not occur every day during the construction period, and do not occur during every hour on days when those activities are underway. During hours when the loudest pieces of construction equipment are not in use, receptors would experience lower construction noise levels. As described below, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction.

Construction noise levels were estimated for the Park Property Alternative based on the distance between sensitive receptors and construction noise sources during construction under this alternative compared to the distance between receptors and sources during Project construction at the Head End Site. For example, if construction resulted in an increase of 10 dBA at a receptor 30 feet away from the Head End Site, receptors roughly 30 feet from the Park Property Alternative site location would be assumed to experience an increase of 10 dBA under this alternative. Based on this methodology, only receptors along 3rd Avenue with a line of sight to the Park Property Alternative and the remaining portion of the Thomas Greene Playground not included in construction would experience higher levels of construction noise under the Park Property Alternative compared to the Project's construction at the Head End Site. All other receptors are predicted to experience comparable or lower levels of construction noise under the Park Property Alternative.

As described above, at receptors other than those along 3rd Avenue with line of sight to the Park Property and the remaining portions of the Thomas Greene Playground, the magnitude of construction noise under this alternative would be comparable to or less than that from the Project's construction at the Head End Site, and the duration of construction noise would also be similar to the Project's construction schedule. Therefore, receptors other than those along 3rd Avenue with a line of sight to the Park Property and the remaining parts of Thomas Greene Playground not included in construction would not experience any significant adverse construction noise impacts beyond those identified for construction of the Project at the Head End Site in Chapter 20, "Construction."

At receptors along 3rd Avenue with a line of sight to the Park Property, construction under the Park Property Alternative would result in noise levels up to approximately 6 dBA higher than those resulting from construction of the Project. Maximum construction noise levels would occur during site excavation and remediation activities. Excavation and remediation activities under the Park Property Alternative would have a duration similar to that for the Project, and total noise levels would be in the "acceptable" to "marginally acceptable" range according to the *CEQR Technical Manual* noise exposure guidelines throughout the duration of construction under this alternative. Therefore construction noise at these receptors associated with the Park Property Alternative would not rise to the level of significant adverse impacts.

At receptors at the eastern portion of Thomas Greene Playground that may remain during construction, construction of the Park Property Alternative would result in noise levels in the high 60s dBA, up to approximately 12 dBA higher than construction noise levels resulting from construction of the Project at the Head End Site, and up to approximately 13 dBA higher than existing noise levels within the Playground on weekdays and up to approximately 19 dBA higher than existing noise levels within the Playground on weekend days under the Alternative Construction Schedule Scenario.[8] The maximum noise levels would be predicted to occur during the most noise intensive activities under CP-2 construction (i.e., excavation and remediation). Noise levels during less intensive SOE construction would produce similar noise level increases as excavation and remediation. Noise levels during sub-structure construction would be in the low 60s dBA, up to approximately 6 dBA higher than construction noise levels resulting from construction of the Project at the Head End Site, and up to approximately 8 dBA higher than existing noise levels within the Playground. Less intense construction under CP-1 (demolition and site prep) and CP-3 (above-grade structure and conduit construction) would result in lower noise levels at the remaining Playground receptors because the majority of the work would occur farther away and would occur for shorter durations than during CP-2 construction. Although portions of the remaining playground include active recreation and would not fall under the category of open spaces

[8] The Project construction schedule assumes that construction activities would typically occur in one 10-hour shift from 7 AM to 5 PM, five days a week on weekdays. However, to make up for weather delays and/or to accelerate the project construction schedule as determined by the construction contractor, there is the potential for some work on weekends. An analysis for an Alternative Construction Schedule Scenario that assumes additional construction activity on the weekends is presented in Chapter 20, "Construction."

requiring serenity and quiet, the predicted levels of construction noise and construction noise level increments would constitute a significant adverse impact at the remaining portions of Thomas Greene Playground. Although the duration of impact noise levels at this receptor would be similar to those under construction of the Project at the Head End Site, the magnitude of the impact would be greater. Construction under this alternative would be required to follow the requirements of the *NYC Noise Control Code* to minimize the construction noise effects on the Thomas Greene Playground. However, even with full compliance with the NYC *Noise Control Code*, there is no effective practical mitigation[9] that could be implemented to avoid these levels during construction.

At receptors west of the Gowanus Canal, construction of the Park Property Alternative would result in noise levels up to approximately 7 dBA lower than those resulting from construction of the Project and would not exceed the impact threshold of 5 dBA. Therefore construction noise at these receptors associated with the Park Property Alternative would not rise to the level of significant adverse impact.

VIBRATION

Under this alternative, construction phasing and activities would be similar to those for the Project. Therefore, vibration levels at receptors in the vicinity of the Park Property would be comparable to those disclosed for the Project because of the similar distances between construction sources and nearby sensitive receptors.

The recognized and potential historical resources within 90 feet of the Park Property Alternative, which includes 234 Butler Street, would require vibration monitoring as part of a CPP as required under NYCDOB TPPN #10/88. During conduit construction, additional S/NR-eligible resources, including the Gowanus Pumping Station, the ASPCA Memorial Building and the Former R.G. Dunn and Company Building on Butler Street would require vibration monitoring under NYCDOB TPPN #10/88. These properties would be prohibited from experiencing construction vibration levels greater than 0.5 inches/second per TPPN #10/88 and the vibration monitoring would be used to ensure that construction means and methods are evaluated and altered if construction does produce vibration above this threshold.

Consequently, as with the Project, the potential for construction vibration impacts under the Park Property Alternative would not rise to the level of a significant adverse impact.

OPEN SPACE

As discussed in detail above, unlike the Project, operation of this alternative would result in the permanent direct displacement of approximately one third of the Thomas Greene Playground on the western portion of the block. In addition to the permanent closure of the western portion of the park, construction of this alternative would result in the temporary displacement of additional areas of the park, which may need to be closed for extended periods of time during construction. These closures would extend beyond the temporary closures at the eastern portion of the park that are expected to occur due to National Grid’s remediation of the Park Property. Since there are limited existing open space resources within the Gowanus neighborhood, the displacement of the active recreation areas within the western portion of Thomas Greene Playground for construction of the Park Property Alternative would result in a substantial loss of recreational resources for area residents and therefore would result in a potential significant adverse impact to open space during construction of the CSO facility. DEP is evaluating options to mitigate this impact; the loss of parkland may also require legislation for alienation of

[9] Noise barriers would not be practical because of security concerns.

parkland. A temporary park elsewhere in the area is expected to be constructed by National Grid during remediation of the Park Property; this temporary park may continue to be used during construction of this alternative by DEP and may contribute to mitigation for the potential significant adverse impact on open space**.**

In addition to temporary and permanent displacement of park space, construction of the Park Property Alternative would have the potential to result in increased air quality and noise emissions affecting nearby open spaces, similar to construction of the Project. As noted above, like the Project, an emissions reduction program would be implemented to minimize the effects of construction under the Park Property Alternative on nearby open space resources including the Canal and the eastern portion of the Thomas Greene Playground that may remain open during construction. In addition, construction under this alternative would be required to follow the requirements of the *NYC Noise Control Code* to minimize the construction noise effects on nearby open space resources (described above). Although the overall construction duration for this alternative would be longer than that for the Head End Facility, the construction activities for this alternative are expected to be similar to those for the Head End Facility. Like the Project, with the emissions reduction program in place, the air emissions under the Park Property Alternative are not expected to rise to the level of a signification adverse effect at any open space receptors. However, as discussed above, even with noise reduction measures in place, noise levels during construction of the Park Property Alternative would be considered a significant adverse impact at the open space receptors at the Thomas Greene Playground.

OTHER TECHNICAL AREAS

Land Use and Neighborhood Character

Like the Project, construction activities under this alternative would affect land use on the Park Property and adjacent streets for construction of in-line sewer improvements and conveyance, but would not affect land use conditions and patterns outside of these areas. Overall, like the Project, the temporary and localized nature of construction under the Park Property Alternative would not result in any significant adverse impacts on local land use patterns of the nearby area.

Throughout the construction period, measures would be implemented to control noise, vibration, and air emissions including dust. Like the Project, construction activity under the Park Property Alternative would be localized and would not alter the character of neighborhoods surrounding the Project Sites.

Socioeconomic Conditions

Like the Project, construction activities under this alternative would not block access or affect the operations of any businesses near the Park Property. As discussed above in the Transportation section, the Park Property Alternative could require some short-term roadway closures near the Park Property of up to 180 days. These short-term closures are not expected to obstruct entrances to any existing businesses but could result in the temporary rerouting of traffic. MPT plans would be developed and implemented to ensure that access to existing businesses near the Park Property would be maintained throughout the construction period. The lane and/or sidewalk closures needed to accommodate construction of the this alternative would not obstruct entrances to any existing businesses and businesses are not expected to be significantly affected by any temporary reductions in pedestrian foot traffic or vehicular delays that could occur as a result of construction activities.

As with the Project, construction of this alternative would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits near the Project Sites created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Like the Project, construction activities under the Park Property Alternative would not result in any significant adverse impacts on socioeconomic conditions.

Community Facilities and Services

Like the Project, construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care facilities. New York City Police Department (NYPD), and the Fire Department City of New York (FDNY) emergency services and response times would not be materially affected by construction under the Park Property Alternative primarily due to the geographic distribution of the police and fire facilities and their respective coverage areas. In addition, emergency vehicle access to the Project Sites would be maintained throughout the construction period. Like the Project, construction activities under the Park Property Alternative would not result in any significant adverse impacts on community facilities and services.

ENVIRONMENTAL JUSTICE

As discussed in Chapter 21, "Environmental Justice," 6 census block groups located near the Head End Site are considered potential environmental justice areas (i.e., a minority or low-income community); this includes the census block groups located immediately to the north of the Park Property, although the Park Property itself is not within a potential environmental justice area (see Figure 21-1). As described above, the Park Property Alternative's effects on the surrounding area would be largely similar to the effects of the Project and construction of the Head End Facility. However, unlike the Project, the Park Property Alternative would result in potential significant adverse impacts to the Thomas Greene Playground, since, although elements of the park would be reconstructed, locating the CSO facility in the park would result in the loss of parkland. In particular, this alternative would result in the displacement of the active recreation areas within the western portion of Thomas Greene Playground which would result in a substantial loss of recreational resources for area residents, which includes members of the potential environmental justice area near the park. DEP is evaluating options to mitigate this impact; the loss of parkland may also require legislation for alienation of parkland. This loss of open space would represent a potential significant adverse burden on the potential environmental justice area, which, as noted above, is located in an area where there are few other open space resources. Therefore, this alternative would result in a potential additional significant adverse burden on a potential environmental justice area which would not occur with the Project.

PUBLIC HEALTH

As described above, similar to the Project, the Park Property Alternative would have the potential to result in significant adverse noise impacts during construction, although only receptors along 3rd Avenue with a line of sight to the Park Property Alternative and the remaining portion of the Thomas Greene Playground not included in construction would experience higher levels of construction noise compared to the Project's construction at the Head End Site. In particular, at receptors at the eastern portion of Thomas Greene Playground that may remain during construction, construction of the Park Property Alternative would result in noise levels in the high 60s dBA, up to approximately 12 dBA higher than construction noise levels resulting from construction of the Project at the Head End Site, and up to approximately 13 dBA higher than existing noise levels within the Playground on weekdays and up to approximately 19 dBA higher than existing noise levels within the Playground on weekend days under the Alternative Construction Schedule Scenario. The maximum noise levels would be predicted to occur during the most noise intensive activities under CP-2 construction (i.e., excavation and remediation). Noise levels during less intensive SOE construction would produce similar noise level increases as excavation and remediation. Noise levels during sub-structure construction would be in the low 60s dBA, up to approximately 6 dBA higher than construction noise levels resulting from construction of the Project at the Head End Site, and up to approximately 8 dBA higher than existing noise levels within the Playground. All other receptors are predicted to experience comparable or lower levels of construction noise under the Park Property Alternative.

As discussed in Chapter 18, “Public Health,” exceedances of the *CEQR Technical Manual* thresholds for significant adverse noise impacts during construction would not necessarily constitute a significant adverse public health impact, as the thresholds for construction noise are based on quality of life considerations and not on public health considerations. As with Project, the predicted noise impacts identified with this alternative, including the predicted noise impacts at the eastern portion of Thomas Greene Playground, would not constitute chronic exposure to high levels of noise because of the temporary and intermittent nature of construction noise. In addition, similar to the Project, the construction impacts under this alternative would not result in prolonged exposure to noise levels above 85 dBA (the *CEQR Technical Manual* recommended threshold for potential hearing loss), or episodic and unpredictable exposure to short-term impacts of noise at high decibel levels. Therefore, similar to the Project, this alternative is not expected to result in potential significant adverse public health impacts.

CONCLUSION

The Park Property Alternative would result in the construction and operation of a CSO facility similar to the Head End Facility (on the Park Property), which would have similar environmental effects. However, unlike the Project, this alternative would have the potential to result in a significant adverse impact to open space as a result of the displacement of a portion of Thomas Greene Playground. Although some elements of the Thomas Greene Playground would be reconstructed, locating the CSO facility in the park would result in the loss of parkland; this loss of parkland may require legislation for alienation of parkland. Similarly, the displacement of this open space resource would be inconsistent with public policies that aim to increase public open space (in particular the WRP). Construction of the CSO facility’s above-grade structure on the Park Property would result in substantial shadows falling on adjacent park areas, which would likely cause potential significant adverse shadows impacts, and the loss of natural features associated with the park (in particular mature street trees) would detract from the pedestrian experience in the area. In addition, during construction of the CSO facility, there would be increased noise levels within the eastern portion of the park (up to approximately 12 dBA higher than construction noise levels resulting from construction of the Project at the Head End Site), which would constitute a significant adverse impact. Overall, this alternative would result in significant negative effects on the Thomas Greene Playground and its usability, and the loss of usable space within this open space resource could alter the neighborhood character of the area to a greater extent than the Project.

As with the Project, this alternative would have a direct impact on architectural resources, since it would similarly require the demolition of the building at 270 Nevins Street, which contributes to the significance of the State/National Register (S/NR)-eligible Gowanus Canal Historic District, although there would be a reduced impact as this alternative would not require the demolition of the other buildings on the Head End Site (242 Nevins Street and 234 Butler Street). Likewise, if archaeological resources are present in the Park Property and retain both integrity and significance, this alternative, as with the Project, would result in a significant adverse impact on archaeological resources, which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

Construction of the Park Property Alternative is also expected to require a longer overall duration, with additional excavation activities, street, and sidewalk closures, as compared to construction of the Head End Facility, in particular because the conveyance conduits would need to be constructed at a longer and greater depth, the tanks would need to be constructed at a greater depth, and additional utility relocation and park reconstruction activities would be required. Although the Park Property Alternative would result in largely similar construction effects as the Project, as noted above, it would result in a significant adverse noise impact on the eastern portion of the Thomas Greene Playground, whereas the Project is not expected to result in a significant adverse construction noise impact in this area.

C. OWLS HEAD ALTERNATIVE SITE LOCATION (6TH STREET ALTERNATIVE)

This section considers the potential impacts of locating the Owls Head Facility at an alternative location to the east of the Owls Head Site along 6th Street (the 6th Street Property), as shown on **Figure 22-3**.

The location of the facility to intercept flows to outfall OH-007 was determined through the Siting and Planning Study. The Study identified eight potential sites for the facility based on criteria which included the size of property, hydraulic analysis and effective capture of CSOs, current or planned land use, proximity to existing infrastructure, length of conveyance piping required, and complexity of utility crossing or relocation. The eight sites were then subjected to more detailed analyses, which resulted in the shortlisting of the Owls Head Site and the 6th Street Property. A side-by-side analysis of the two sites determined that the Owls Head Site was the preferred location primarily due to its location adjacent to outfall OH-007, which provides advantages from the standpoint of engineering, hydraulics, conveyance, and constructability. The Study determined that, among the disadvantages of the 6th Street Property, construction of the facility at this location would cost substantially more than construction at the Owls Head Site, largely due to the additional design and construction costs associated with deeper construction (the greater distance from the outfall to the 6th Street Property requires deeper systems than the Owls Head Site for proper hydraulic operation) and longer conveyance distance.

Although USEPA agreed with DEP’s recommendation for use of the Owls Head Site for the Owls Head Facility in the Settlement Agreement, the City is not under a USEPA order directing the City to construct the Owls Head Facility at the preferred alternative. Therefore, DEP may construct a CSO facility (the 6th Street Alternative, described below) at the 6th Street Property as an alternative to the Owls Head Facility. For the purposes of this assessment it is assumed that there would be no changes to the Head End Facility under this alternative, therefore there would be no changes to the analysis findings concerning the Head End Facility.

DESCRIPTION OF THE 6TH STREET ALTERNATIVE

Under this alternative, a facility similar to the Owls Head Facility would be constructed at the 6th Street Property to intercept overflow of CSO solids from CSO outfall OH-007. The 6th Street Property consists of two lots: Block 979, Lots 18 and 23. Lot 23, located at 141 6th Street, contains a recycling hauling business with a one-story building on 6th Street and an open storage yard that extends to the Canal. Lot 18, located at 163 6th Street, is a vacant site that is currently undergoing redevelopment with an approximately 76,000 square foot (sf) self-storage facility, as described in Chapter 2, “Land Use, Zoning, and Public Policy.” Under this alternative, it is assumed that both lots would be acquired by DEP and that the existing recycling facility and the redeveloped self-storage facility would both be demolished in order to construct the facility under the 6th Street Alternative. A construction staging area near the 6th Street Property would also need to be provided under this alternative, which may require the acquisition of another nearby property.

The conceptual design of the facility under the 6th Street Alternative is similar to the design of the Owls Head Facility, and includes a 31,000-sf below-grade structure containing the 4-MG tank and tank system, as well as an approximately 17,600 sf, two-story above grade structure that would house the screening equipment, electrical equipment, an odor control system, an emergency generator, and crew areas. The above-grade structure would be located at the southern end of the 6th Street Property fronting on 6th Street (see **Figure 22-3**). Similar to the Owls Head Facility, the remainder of the surface area on the 6th Street Property would be paved and accessible for maintenance and operations with landscaping elements where appropriate; however, waterfront public access areas on the site would not be feasible given that the facility would occupy the majority of the site and there would be limited space for a public access path from 6th Street. As with the Owls Head Facility, the flow-through design capacity for the 6th Street facility would be 146 MGD.

It is assumed that similar upgrades to existing sewer infrastructure would be required to capture the total design flow rates required for the facility under the 6th Street Alternative. In particular, the existing 2nd Avenue regulator would be replaced with a new 2nd Avenue regulator and the existing grit chamber, outfall OH-007, and the 2nd Avenue Pumping Station would be demolished and removed. A new grit chamber, a new outfall, and a new, similar pumping station with a 1 MGD capacity would be constructed in the existing locations on 2nd Avenue. Conveyance conduits would be constructed along 6th Street and 2nd Avenue to connect the 6th Street facility to the new grit chamber, outfall, and pumping station.

Operations of the 6th Street Alternative would be similar to operations at the Owls Head Facility, including: screening of influent flows to remove large debris, storage in the tanks until there is sufficient downstream capacity to convey the stored flow to the Owls Head WWTP, pump-back of the flow from the tanks, flushing of accumulated solids in the storage cells, and degritting (see Chapter 1, "Project Description," for a full description of the facility systems and operations).

As with the Park Property Alternative discussed above (which would result in a CSO control facility similar to the Head End Facility), this alternative would result in a CSO control facility similar to the Owls Head Facility which would result in similar operational effects (e.g., similar worker trips, energy consumption, and solid waste generation). Therefore, this alternative would not alter the findings of the EIS and would not result in any significant adverse impacts in the following technical areas: solid waste and sanitation services, energy, transportation, and greenhouse gas emissions and climate change. In the remaining technical areas, the alternative location for the facility may result in new or different effects as compared with the Owls Head Facility (e.g., displacement of different uses); therefore; additional analyses in these areas is warranted and are presented below.

LAND USE, ZONING, AND PUBLIC POLICY

As described in Chapter 2, "Land Use, Zoning, and Public Policy," the area near the 6th Street Property primarily contains manufacturing and shipping facilities in one- and two-story buildings; commercial uses are limited to an office building that contains New York State Department of Corrections (DOC) facilities, located adjacent to the 6th Street Property along 2nd Avenue. As with the Owls Head Facility, the 6th Street Alternative would be compatible with these other uses, and, as there are no sensitive uses in the area (such as residential buildings) operation of the facility would not have an adverse effect on adjacent properties. The 6th Street Alternative would also be a permitted use in the M2-1 zoning district, under Use Group 18, and it is expected that the facility would be designed to meet all applicable zoning requirements. The 6th Street Property is also located within the boundaries of the Coastal Zone: and this alternative would not affect the Project's consistency with the policies of the WRP, with the possible exception of WRP Policy 8 relating to the provision of public open space in the waterfront area (in particular, no waterfront public access areas would be provided at the 6th Street Property, whereas DEP is evaluating the potential for the Project to include accessible waterfront open space at the Owls Head Site where it does not interfere or conflict with the operation of the Owls Head Facility). Overall, as with the

Project, this alternative would not result in any significant adverse impacts to land use, zoning, or public policy.

SOCIOECONOMIC CONDITIONS

Under the 6th Street Alternative, the Owls Head Facility, located on Block 977, Lot 3 would instead be located on Block 979, Lots 18 and 23 (referred to as the 6th Street Property). Lot 23 contains a recycling hauling business that is expected to vacate the property under this alternative, and Lot 18 is a vacant site that is currently undergoing redevelopment: in 2016, CubeSmart, a self-storage developer, obtained a long-term ground lease for the property to develop a 76,000 sf self-storage facility.[10] Based on industry employment ratios, self-storage facilities are low employment generators and a facility of such size is estimated to employ approximately 5 employees.[11]

The storage facility is currently under construction and is expected to be completed within 12 months. The displaced business represents approximately 0.1 percent of businesses and 0.04 percent of employees in the socioeconomic study area (5 employees out of a study area total of 11,916 employees; see Chapter 3, "Socioeconomic Conditions"). As compared with the Project, the displacement of the self-storage facility would increase the share of businesses and employees displaced in the Transportation and Warehousing Sectors to 5.6 percent and 1.4 percent, respectively.

The self-storage facility is not part of the value chain[12] of any industry sector, typically caters to residents, and therefore does not directly support businesses in the area. It also does not bring in a customer base to the area for local businesses; customers typically bring in items for storage once and tend to not come back on an ongoing basis. The limited number of displaced workers does not form a customer base critical for existing businesses in the area. The alternative would therefore not result in significant adverse impacts on socioeconomic conditions due to indirect business displacement.

Residents seeking to store their property are not anticipated to be impacted by the displacement, since there are several self-storage facilities in the socioeconomic study area, the closest of which is located two blocks away at 338 3rd Avenue. Self-storage facilities are commonly concentrated in industrial areas such as the area near the 6th Street Property. In particular, similar to the Owls Head Site, the 6th Street Property is located within the Southwest Brooklyn Industrial Business Zone (IBZ), discussed in Chapter 2, "Land Use, Zoning, and Public Policy." According to the New York City Department of City Planning (DCP), IBZs, including the Southwest Brooklyn IBZ, receive approximately 25 percent of self-storage space. In addition, there are currently 2 to 3 million square feet of self-storage space in the development pipeline throughout New York City.[13] Most of the new facilities are expected to be located in the Bronx, Brooklyn, and Queens, with Brooklyn projected to receive 10 facilities or approximately one million square feet.[14] Given the adequate availability of self-storage options in the socioeconomic study area and the City as a whole, the displacement would not affect business conditions in this particular industry

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[10] DNA Info, May 2016, https://www.dnainfo.com/new-york/20160511/gowanus/self-storage-facility-replacing-metal-yard-on-gowanus-canal

[11] Institute of Traffic Engineering, Trip Generations, 5th ed. (1991)

[12] Defined as a set of activities that a firm operating in a specific industry sector performs in order to deliver a valuable end product or service for the market.

[13] The Wall Street Journal, May 2016: Self-Storage Thrives in Cramped New York City, http://www.wsj.com/articles/self-storage-thrives-in-cramped-new-york-city-1462752494

[14] Storage database provider STR at www.str.com (data from July 2016)

sector and its economic viability within or outside the socioeconomic study area. The 6th Street Alternative would therefore not result in significant adverse impacts due to adverse effects on specific industries.

As noted above, a nearby construction staging area would need to be provided under this alternative, therefore a property other than the 6th Street Property would need to be leased. The lease of this additional construction staging site would displace any use on that site. However, given that the area near the 6th Street Property primarily contains auto-related, warehousing, and construction businesses which provide goods and services that can be found elsewhere and which generally feature relatively low numbers of workers, the displacement of any business for a construction staging area would likely not significantly affect business conditions in any industry or any category of business within or outside the study area.

Like the Project, the 6th Street Alternative would not directly displace any residential uses and would not introduce any commercial development that could cause indirect residential displacement due to increased rents.

COMMUNITY FACILITIES

The 6th Street Alternative would not have a direct effect on community facilities because the 6th Street facility would not physically displace any on-site community facilities. As with the Project, this alternative would not result in new residential development and would not introduce a new residential population that could result in indirect effects by increasing demand for community facility services.

OPEN SPACE

As with the Owls Head Site, the 6th Street Property does not contain any publicly accessible open space, therefore, construction of the facility under the 6th Street Alternative would not displace or limit access to any existing open space. As discussed below, construction and operation of the 6th Street Alternative would not result in any significant adverse impacts from shadows, air quality, or noise affecting nearby open space (in particular, the Whole Foods Market open space located across the 4th Street Turning Basin from the 6th Street Property). Therefore, as with the Project, this alternative would not result in any significant adverse impacts to open space.

SHADOWS

Under this alternative, the above-grade structure would be located at the southern end of the 6th Street Property fronting on 6th Street, farther away and further south from the Canal than the Owls Head Facility. Therefore, with this alternative, less shadow would fall on the Canal compared with the Project during all seasons. During the late spring and summer, little or no new shadow would reach the Canal with this alternative, unlike the Project, which would cast a small area of new shadow at or near the end of the day. In the early spring and the fall, no shadow would likely reach the Canal for most of the day, and minimal new shadow could reach the Canal near the end of the day, whereas the Project would result in shadows for longer durations on the Canal. In winter, shadows would be smaller with this alternative than with the Project. Overall, over the course of the year this alternative would cast less shadow on the Canal than the Project. In addition, it would cast little to no shadow on the Whole Foods Market open space, because as described in Chapter 6, “Shadows,” the longest shadow that the 50-foot-high above-grade structure could cast within in the analysis timeframe is 215 feet, and the portions of the Whole Foods Market open space closest to the 6th Street Site are approximately 215 feet away. Similar to the Project, this alternative would not result in any significant adverse shadow impacts.

HISTORIC AND CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

The archaeological sensitivity of the 6th Street Property was previously assessed through the completion of three large-scale surveys of the Gowanus Canal and its immediate vicinity (see Chapter 7, "Historic and Cultural Resources"). The only previously identified archaeological resources located on the 6th Street Property are the cribbing and bulkheads of the S/NR-eligible Gowanus Canal. These resources are likely present along the length of the Canal within this study area within a distance of approximately 25 feet from the Canal's bulkhead.

Similar to the Owls Head Site, the 6th Street Property is considered to be sensitive for the presence of the following types of archaeological resources (see Chapter 7, "Historic and Cultural Resources"):

Similar to the Owls Head Site, the analysis presented in Chapter 7, "Historic and Cultural Resources," indicates that 6th Street Property is considered to be sensitive for the presence of the additional types of archaeological resources that may be present in the vicinity of the Gowanus neighborhood. As described in Chapter 7, the 6th Street Property is located near the location of the Battle of Brooklyn, which occurred in August 1776. While it is likely that the site is located within a Revolutionary War Battle Action Corridor, it is unlikely that any evidence of activities related to the battle would have survived the intensive development that followed in a manner that would be archaeologically recoverable. Similarly, there is a possibility that a mass grave associated with those who perished in the Battle of Brooklyn is situated in the general area bounded by 7th and 8th Streets and 2nd and 4th Avenues. Given the absence of evidence to the contrary, the potential presence of human remains associated with the battle on the 6th Street Property and surrounding streetbeds cannot be ruled out. If human remains are present on the 6th Street Property, they would be considered a significant resource; however, it is likely that they would be disarticulated and in poor condition as a result of the subsequent development. In addition, such remains would be located below mid-19th and 20th century fill layers and modern disturbances.

Finally, features associated with mid-19th through early 20th century industrial activity on the 6th Street Property are expected across the site between depths of approximately 0 to 15 feet below grade. Although there is a high likelihood that industrial features are present and intact, there is a low likelihood that significant information could be recovered through archaeological methods that could not also be recovered through other methods, such as documentary research.

As with the Project, replacement of outfall OH-007 will result in a potential significant adverse impact on timber cribbing and the bulkhead associated with the Gowanus Canal. While it is not likely, if archaeological resources are present beneath the 2nd Avenue or 7th Street streetbeds and they retain both integrity and significance, this alternative would also result in a significant adverse impact on those archaeological resources. As with the Project, impacts would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with SHPO and LPC.

ARCHITECTURAL RESOURCES

As with the Owls Head Facility, the facility under the 6th Street Alternative would be built within the S/NR-eligible Gowanus Canal Historic District. This alternative would require the demolition of a one-story building on Block 979, Lot 23, at the northeast corner of 2nd Avenue and 6th Street (141 6th Street/aka 27-31 2nd Avenue). This is a non-descript one-story brick building with no ornament that houses a recycling hauling facility. It has a number of sealed and rebuilt openings including large garage entrances with roll down metal gates on 6th Street. The Draft National Register Nomination Form does not identify the building as Non-Contributing but characterizes the building as a "utilitarian warehouse/structure." Therefore, similar to the Owls Head Site, the 6th Street Alternative would demolish a structure that does not appear to possess any particular historical significance or significant association with the Gowanus Canal. DEP considers this building as Non-Contributing to the 2014 S/NR-eligible Canal Historic District and its demolition would not constitute a significant adverse impact on architectural resources. The eighteen reinforced concrete coal storage silos (Burns Brothers Coal Pockets) and two-story building at 163 6th Street previously located on the site and as described in the 2013 Draft National Register Nomination Form for the Gowanus Canal Historic District were demolished by the previous owner.[15]

Although there are properties within the S/NR-eligible Gowanus Canal Historic District located across 2nd Avenue and 6th Street from the 6th Street Property, and conduits would be constructed in 2nd Avenue within 90 feet of buildings also within the S/NR-eligible historic district boundaries, none of the buildings are architecturally distinguished or contain significant architectural features or ornament that would require construction protection measures as set forth in TPPN#10/88. Therefore, consultation is also being undertaken with SHPO to determine what additional protection measures may be required for these properties with the Project.

Therefore, as with the Project, the 6th Street Alternative would not result in any significant adverse impacts to architectural resources.

URBAN DESIGN AND VISUAL RESOURCES

The 6th Street Property currently contains a one-story building, an open storage yard, and a vacant property that is undergoing redevelopment. There are limited views of the 4th Street Turning Basin from the upland area near the 6th Street Property due to the high fences that surround much of the site. Therefore, construction of the 6th Street facility would not result in the loss of any visual resources or significant views of the Canal. As with the Owls Head Facility, the 6th Street Alternative is anticipated to comply with applicable zoning regulations regarding bulk and built form, and would result in physical and visual changes consistent with zoning regulations near the Canal. Therefore, as with the Project, this alternative would not result in a significant adverse impact to urban design and visual resources.

NATURAL RESOURCES

Similar to the Owls Head Site, the 6th Street Property is located along a portion of the Canal (the 4th Street Turning Basin), which is mapped by the U.S. Fish and Wildlife Service (USFWS) as an estuarine subtidal wetland with an unconsolidated bottom that is permanently flooded and has been excavated; it is also mapped by NYSDEC as a littoral zone (LZ) tidal wetland (see Figures 9-2a and 9-2b in Chapter 9, "Natural Resources"). Prior to the construction for the 6th Street Alternative and any related infrastructure improvements, the bulkhead on the 6th Street Property would be assessed and rehabilitated as necessary. Similar to the Project, a new outfall would be constructed; however, under this alternative, the outfall would be at the location of the existing outfall at the end of 2nd Avenue, rather than on the Owls Head Site. Therefore, construction for the 6th Street Alternative would result in temporary and/or permanent disturbances to the NYSDEC littoral zone tidal wetlands. Given that a portion of the bulkhead at the 6th Street Property appears to be intact, and the area of bulkhead improvement at the 6th Street Property is likely smaller than the area of bulkhead improvement at the Owls Head Site, this alternative would likely

[15] Draft National Register of Historic Places Registration Form, Gowanus Canal Historic District, December 2013, Section 7, p. 26. 163 6th Street is identified as 167 6th Street in the Draft National Register Nomination Form.

result in less disturbance to littoral zone tidal wetlands than the Owls Head Facility. As with the Owls Head Facility, any permanent impacts to NYSDEC littoral zone wetlands would be mitigated in consultation with NYSDEC, and construction would be performed in conformance with a SWPPP and any other USACE or NYSDEC regulatory requirements to prevent and minimize indirect impacts to wetlands (see Chapter 9, "Natural Resources"). The SWPPP would include Sediment and Erosion Control protective measures and best management practices, such as silt fences and hay bales, to minimize direct impacts to wetlands.

Similar to the Owls Head Site, the 6th Street Property's upland area contains disturbed or developed land with few natural resources of concern. Therefore, this alternative would not result in significant adverse impacts to terrestrial resources or habitats. Although the 6th Street Property is located partially within the 100-year floodplain (Zone AE) and partially within the 500-year floodplain (shown on Figure 9-1 in Chapter 9, "Natural Resources,") the floodplain within and adjacent to the 6th Street Property would not be affected by construction or regrading/filling of the floodplain, and occupancy of the floodplain associated with the 6th Street Alternative would not affect the flood elevation or increased risks due to flooding in the vicinity of 6th Street Property. Once operational, as with the Owls Head Facility, the 6th Street Alternative would provide ongoing benefits to water quality in the Canal. Therefore, with the implementation of the mitigation and protective measures associated with shoreline construction described above, this alternative would not result in any significant adverse impacts to natural resources.

HAZARDOUS MATERIALS

This alternative would entail extensive excavation and dewatering for construction for the 6th Street Alternative. No subsurface (soil and groundwater) data is available for this block but current or prior land uses included: truck rental (it is unknown if this included fueling and/or repairs), iron and metal operations, and a recycling facility. The block was listed on the Toxic Release Inventory for toluene emissions associated with wood office and store fixtures, partitions, shelving, and lockers.

The 6th Street Property would require investigation to determine the relative nature and extent of its contamination. Contamination is likely comparable to, and potentially worse than, that at the Owls Head Site, which also had historical industrial/manufacturing uses. The Owls Head Site had levels of SVOCs, metals, PCBs, and pesticides in the shallow soil, consistent with historical fill material rather than spills, but evidence of deeper coal tar and petroleum (presumably related to an off-site MGP) contamination was identified. The 6th Street Property may have shallow contamination with petroleum or other contaminants related to its past usage (e.g., as a truck rental use) and may also have deeper MGP-related contamination. Regardless, the types of contamination generally associated with the identified historical uses and any deeper MGP contamination would readily be addressed by standard remediation techniques. Even if the site is extensively contaminated, remediation of the 6th Street Property could be performed in a manner to avoid adverse impacts, as it would be for the Owls Head Site.

WATER AND SEWER INFRASTRUCTURE

Unlike the Owls Head Facility, the facility under the 6th Street Alternative has not undergone detailed design or hydraulic analysis. However, if selected, this alternative would be designed to function similar to the Owls Head Facility and provide the required reduction in CSO solids while maintaining hydraulic neutrality. Therefore, this alternative is not expected to result in adverse effects to wastewater treatment performance or sanitary and stormwater drainage and management.

AIR QUALITY

As discussed above, the major components and operations associated with the 6th Street Alternative would be similar to those identified at the Owls Head Facility. The two-story above grade structure would be located at the southern end of the site along 6th Street. As in the Owls Head Facility, the structure would house HVAC equipment, an odor control system, as well as an emergency generator. While the facility funder the 6th Street Alternative would be located farther from the planned future projects located directly across the Gowanus Canal from the Owls Head Facility, the alternative would be located closer to the outdoor open space at Whole Foods Market (directly across the Gowanus Canal from the 6th Street Property). While the distances to open space receptors would be closer for the 6th Street Alternative, elevated receptors, which are the locations of maximum predicted pollutant concentrations, would be located further from this alternative when compared with the Owls Head Facility. Therefore, predicted concentrations would be similar to or less than those identified for the Owls Head Facility, and this alternative is not anticipated to result in any significant adverse air quality impacts.

NOISE

Neither the Project nor the 6th Street Alternative would result in significant adverse noise impacts. In the 6th Street Alternative, traffic volumes would increase in the area due to general background growth As with the Project, increases in traffic as a result of the 6th Street Alternative are not expected to generate sufficient traffic to cause a 3 dBA increase in noise levels (i.e., doubling noise passenger car-equivalents [Noise PCEs]) at any surrounding receptors, which would be considered a significant increase in noise. Likewise, the 6th Street Alternative does not include above-ground stationary noise sources that could potentially increase noise levels at surrounding receptors. The building's mechanical systems (i.e., HVAC systems, emergency generators, odor control systems, pumps, etc.) would meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code, the New York City Zoning Resolution [NYCZR] Performance Standards for Manufacturing zones, and the DOB Mechanical Code) and would avoid producing noise levels that would result in any significant increase in ambient noise levels. Further, this equipment would be located either indoors or below grade without being in the line of sight to nearby sensitive receptors.

Therefore, existing sensitive receptors are not expected to experience increased noise levels as a result of the 6th Street Alternative. Furthermore, the 6th Street Alternative would not introduce any new noise sensitive receptors into the noisy area. Therefore, the 6th Street Alternative is not expected to result in a significant adverse noise impact.

NEIGHBORHOOD CHARACTER

Similar to the Owls Head Facility, the 6th Street Alternative would be compatible with the primarily industrial and commercial land uses in the area, and would not have a significant adverse impact on the socioeconomic character, historic resources, or open space resources that define the character of the surrounding area. Therefore, as with the project, this alternative would not result in a significant adverse impact to neighborhood character.

CONSTRUCTION

The construction phasing and activities as well as the equipment used for construction of the 6th Street Alternative would be similar to those for the Owls Head Facility except that the tanks would need to be constructed at a greater depth and the new conveyance conduit would need to be constructed at a greater depth and for a longer distance. In addition, it is assumed that similar upgrades to existing sewer infrastructure would be required under this alternative to capture the total design flow rates required for the 6th Street Facility. As noted above, the 6th Street Property consists of two lots: Block 979, Lots 18 and 23. Lot 23 contains a recycling hauling business with a one-story building on 6th Street and an open storage yard that extends to the Canal. In addition, a separate constructing staging area would be required under this alternative; the proximity of the staging area to the construction site would influence the impacts of construction activities.

The sections below analyze the potential for significant adverse construction-period impacts under this alternative in the areas of transportation, air quality, noise and vibration, open space, and other technical areas including land use and neighborhood character, socioeconomic conditions, and community facilities and services. The potential for significant adverse construction-period impacts under this alternative in the areas of historic and cultural resources, natural resources, hazardous materials, and water and sewer infrastructure are discussed above in the respective sections.

TRANSPORTATION

Peak construction trip increments under this alternative would be very similar to the Project. In addition, the 6th Street Alternative is expected to have a construction vehicular access/egress location along 2nd Avenue between 5th Street and 6th Street, which is the same as under the Project. Consequently, construction trip-making patterns would be identical to those described for the Project.

As noted above, a separate constructing staging area would be required under this alternative; the proximity of the staging area to the construction site would influence the transportation impacts of construction activities (i.e., the potential need for road closures between the construction staging area and the Project Site).

Therefore, the 6th Street Alternative may result in worse effects on area traffic during construction.

AIR QUALITY

The construction activities for the 6th Street Alternative and the equipment used to construct the facility are expected to be similar to those for the Owls Head Facility. Like the Project, measures would be taken to reduce pollutant emissions during construction under the 6th Street Alternative in accordance with all applicable laws, regulations, and building codes, including dust suppression measures and idling restrictions. In addition, like the Project, construction under the 6th Street Alternative is subject to New York City Local Law 77, which requires the use of ULSD fuel and BAT for equipment at the time of construction. With the emissions reduction measures in place, construction activities under this alternative would be similar to that for the Project and the proximity of construction to nearby sensitive receptor locations would also be similar; therefore, the 6th Street Alternative would not be expected to result in significant air quality impacts during construction.

NOISE

The maximum predicted noise levels as a result of the 6th Street Alternative would occur during the most noise-intensive activities of construction such as SOE and site excavation, which would not occur every day during the construction period, and do not occur during every hour on days when those activities are underway. During hours when the loudest pieces of construction equipment are not in use, receptors would experience lower construction noise levels. As described below, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction.

Construction noise levels were estimated for the 6th Street Alternative based on the distance between sensitive receptors and construction noise sources during construction under this alternative compared to the distance between receptors and sources during Project construction at the Owls Head Site. For example, if construction resulted in an increase of 10 dBA at a receptor 30 feet away from the Owls Head Site, receptors roughly 30 feet from the 6th Street Alternative site location would be assumed to experience an increase of 10 dBA under this alternative. Based on this methodology, only the publicly accessible open space located directly across the 4th Street Turning Basin from the 6th Street Property (i.e., the Whole Foods Market Open Space) would experience higher levels of construction noise under the 6th Street Alternative compared to the Project's construction at the Owls Head Site. All other receptors are predicted to experience comparable or lower levels of construction noise under the 6th Street Alternative. Therefore, at these locations, the potential for construction noise impacts under the 6th Street Alternative would be comparable to or lower than the Project.

As described above, at receptors other than the Whole Foods Market Open Space, the magnitude of construction noise under this alternative would be comparable to or less than that from the Project's construction at the Owls Head Site. Therefore, the potential for significant adverse construction noise impacts under the 6th Street Alternative at receptors other than the Whole Foods Market Open Space would be comparable to or lower than those identified for construction of the Project at the Head End Site in Chapter 20, "Construction."

At the publicly accessible open space located directly across the 4th Street Turning Basin from the 6th Street Property (i.e., the Whole Foods Market Open Space), construction of the 6th Street Alternative would result in noise levels up to approximately 8 dBA higher than those resulting from construction of the Project at the Owls Head Site, and up to approximately 15 dBA higher than existing noise levels within the open space on both weekdays and weekend days under the Alternative Construction Schedule Scenario. Absolute noise levels resulting from construction of the Project under the 6th Street Alternative would exceed the 55 dBA L_{10} noise level for passive open spaces by up to approximately 16 dBA. However, noise levels in this area already exceed CEQR-recommended values under the existing condition. The noise level increases described above would have the potential to occur at this receptor throughout the SOE and substructure phases of CP-2, having a similar duration to those phases during construction of the Project at the Owls Head Site. While construction noise levels during CP-1 and CP-3 would be expected to be lower at this receptor, exceedances of the *CEQR Technical Manual* noise impact criteria and noise exposure guidelines may still occur intermittently throughout these periods. Consequently, construction of the Project under the 6th Street Alternative has the potential to result in significant adverse noise impacts at the Whole Foods Market Open Space not identified for construction of the Project at the Owls Head Site. While this is not desirable, there is no effective practical mitigation[16] that could be implemented to avoid these levels during construction. Noise levels in many parks and open space areas throughout the city, which are located near heavily trafficked roadways and/or near construction sites, experience comparable and sometimes higher noise levels.

VIBRATION

Under the 6th Street Alternative, construction schedule and methods would be similar to those for the Project. Therefore, vibration levels at receptors in the vicinity of the 6th Street Site would experience comparable vibrations as the Project because of comparable distances between construction sources and nearby sensitive receptors.

There are no recognized historical resources within 90 feet of the 6th Street Property. Therefore, a CPP with vibration monitoring will not be required under NYCDOB TPPN #10/88.

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[16] Noise barriers would not be practical because of security concerns.

Consequently, the potential for construction vibration impacts under the 6th Street Alternative would be similar or lower than those of the Project.

OPEN SPACE

Like the Owls Head Site, there are no publicly accessible open spaces within the 6th Street Property and no open space resources would be used for staging or other construction activities under this alternative. An emissions reduction program would be implemented to minimize the effects of construction under the 6th Street Alternative on nearby open space resources. In addition, construction under the 6th Street Alternative would be required to follow the requirements of the *NYC Noise Control Code* to minimize the construction noise effects. The construction activities associated with the 6th Street Alternative are expected to be similar to those for the Owls Head Facility. Like the Project, with the emissions reduction program and the noise reduction measures in place, the air emission and noise levels during construction under the 6th Street Alternative are not expected to rise to the level of a signification adverse effect at any open space receptors.

OTHER TECHNICAL AREAS

Land Use and Neighborhood Character

Like the Project, construction activities under the 6th Street Alternative would affect land use on the Project Sites, but would not affect land use conditions and patterns outside of these areas. Overall, like the Project, the temporary and localized nature of construction under the 6th Street Alternative would not result in any significant adverse impacts on local land use patterns of the nearby area.

Throughout the construction period, measures would be implemented to control noise, vibration, and air emissions including dust. Like the Project, construction activity under the 6th Street Alternative would be localized and would not alter the character of the neighborhoods surrounding the 6th Street Property.

Socioeconomic Conditions

Like the Project, construction activities under the 6th Street Alternative could temporarily affect pedestrian and vehicular access to businesses near the Project Sites. However, the lane and/or sidewalk closures needed to accommodate construction of the Project would not obstruct entrances to any existing businesses and businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. MPT plans would be developed and implemented to ensure that access to existing businesses near the 6th Street Property would be maintained throughout the construction period.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits near the Project Sites created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Like the Project, construction activities under the 6th Street Alternative would not result in any significant adverse impacts on socioeconomic conditions.

Community Facilities and Services

No community facilities (i.e., public or publicly funded schools, libraries, child care centers, health care facilities, and fire and police stations) would be directly affected by construction activities.

As with the Project, construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care facilities. NYPD and FDNY emergency services and response times would not be materially affected by construction under the 6th

Street Alternative primarily due to the geographic distribution of the police and fire facilities and their respective coverage areas. In addition, emergency vehicle access to the Project Sites would be maintained throughout the construction period. Like the Project, construction activities under the 6th Street Alternative would not result in any significant adverse impacts on community facilities and services.

ENVIRONMENTAL JUSTICE

As shown on Figure 21-1 in Chapter 21, "Environmental Justice," the 6th Street Property is not located within a potential environmental justice area, and there are no potential environmental justice areas adjacent to the 6th Street Property. Therefore, the environmental effects identified for this alternative would not represent an additional significant adverse environmental burden on an environmental justice community.

PUBLIC HEALTH

As described above, similar to the Project, the 6th Street Alternative would have the potential to result in significant adverse noise impacts during construction. However, only the publicly accessible open space located directly across the 4th Street Turning Basin from the 6th Street Property (i.e., the Whole Foods Market Open Space) would experience higher levels of construction noise under the 6th Street Alternative compared to the Project's construction at the Owls Head Site. At this receptor, construction of the 6th Street Alternative would result in noise levels up to approximately 8 dBA higher than those resulting from construction of the Project at the Owls Head Site, and up to approximately 15 dBA higher than existing noise levels within the open space on both weekdays and weekend days under the Alternative Construction Schedule Scenario. Consequently, construction of the Project under the 6th Street Alternative has the potential to result in significant adverse noise impacts at the Whole Foods Market Open Space not identified for construction of the Project at the Owls Head Site. All other receptors are predicted to experience comparable or lower levels of construction noise under the 6th Street Alternative. Therefore, at these locations, the potential for construction noise impacts under the 6th Street Alternative would be comparable to or lower than the Project.

As discussed in Chapter 18, "Public Health," exceedances of the *CEQR Technical Manual* thresholds for significant adverse noise impacts during construction would not necessarily constitute a significant adverse public health impact, as the thresholds for construction noise are based on quality of life considerations and not on public health considerations. As with the Project, the predicted noise impacts identified with this alternative, including the predicted noise impacts at Whole Foods Market Open Space, would not constitute chronic exposure to high levels of noise because of the temporary and intermittent nature of construction noise. In addition, similar to the Project, the construction impacts under this alternative would not result in prolonged exposure to noise levels above 85 dBA (the *CEQR Technical Manual* recommended threshold for potential hearing loss), or episodic and unpredictable exposure to short-term impacts of noise at high decibel levels. Therefore, similar to the Project, this alternative is not expected to result in potential significant adverse public health impacts.

CONCLUSION

The 6th Street Alternative would result in the construction and operation of a CSO facility on the 6th Street Property similar to the Owls Head Facility on the 6th Street Property. Although the 6th Street Property may have more extensive contamination as compared with the Owls Head Site due to its historical uses, standard remediation techniques would be employed to address that contamination in a manner similar to the remediation of the Owls Head Facility. This alternative would require the displacement of different businesses than would be displaced for the Owls Head Facility; in particular, this alternative would displace a self-storage facility that is currently under construction on the 6th Street Property. However, given the adequate availability of self-storage options in the socioeconomic study area and the City as a whole, the displacement of this self-storage facility would not affect business conditions in this particular industry sector and its economic viability within or outside the socioeconomic study area, and, as with the Project, this alternative would not result in any significant adverse impacts to socioeconomic conditions.

This alternative may result in different adverse effects than those identified for the Project as construction of the facility under this alternative would result in noise levels at the Whole Foods Market open space that are up to approximately 8 dBA higher than the noise resulting from construction of the Project at the Owls Head Site. The noise levels at the Whole Foods Market open space resulting from construction under the 6th Street Alternative would constitute a significant adverse impact not identified for construction of the Project at the Owls Head Site. While this is not desirable, there is no effective practical mitigation that could be implemented to avoid these levels during construction. Noise levels in many parks and open space areas throughout the city, which are located near heavily trafficked roadways and/or near construction sites, experience comparable and sometimes higher noise levels. ✷

Chapter 23: Mitigation

A. INTRODUCTION

This chapter describes and evaluates feasible options for mitigation to reduce or eliminate to the maximum extent practicable the potential significant adverse impacts identified in this Environmental Impact Statement (EIS). As discussed below, the Project has the potential to result in significant adverse impacts to historic and cultural resources and temporary significant adverse noise impacts during the construction period. Potential mitigation measures are identified below.

B. POTENTIAL MITIGATION MEASURES

HISTORIC AND CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

As described in Chapter 7, "Historic and Cultural Resources" and summarized in **Table 23-1**, portions of the Head End and Owls Head Sites and the surrounding streetbeds are considered to have archaeological sensitivity. If archaeological resources are present in any of the project site locations that retain both integrity and significance, the Project would result in a potential significant adverse impact which would be mitigated to the maximum extent practicable through additional analyses, archaeological monitoring, or an alternative method developed in consultation with the New York State Historic Preservation Office (SHPO) and the New York City Landmarks Preservation Commission (LPC).

Table 23-1
Potential Archaeological Resources and Recommendations for Future Analysis

Location within Project Sites	Potential Resource Type	Archaeological Research Value (if present)	Likely Integrity	Recommendation
Head End Site; Nevins Street	Prehistoric Site	High	Low	Archaeological Monitoring
Nevins Street	Tide Mill Complex	High	Low	Archaeological Monitoring
Owls Head Site; 2nd Ave; 7th Street	Battle of Brooklyn (Battle Action Corridor)	Low	Low	No further action
7th Street	Battle of Brooklyn (Soldier Burials)	High	Low	Archaeological Monitoring
Head End Site; Owls Head Site	Gowanus Canal (bulkhead and cribbing)	Moderate	High	Archaeological Monitoring if affected
Head End Site; Owls Head Site	Industrial Sites	Low	High	No further action

Sources: Lee, et al. 2011 and Loorya and Dietrich 2012.

Potential significant adverse impacts would be mitigated to the maximum extent practicable through additional archaeological analysis including monitoring during construction in consultation with LPC and

SHPO. Recommendations for future archaeological analyses are presented in **Table 23-1**. Consultation with SHPO and LPC is on-going to determine an appropriate course of action for any future archaeological analysis of the Project Sites. Prior to the start of construction, an archaeological monitoring plan will be prepared that will identify the horizontal and vertical locations of Project elements that have the potential to impact archaeological resources and will describe monitoring procedures, including an unanticipated discoveries plan. Implementation of this monitoring plan would be sufficient to avoid, minimize, or mitigate adverse impacts of the Project.

ARCHITECTURAL RESOURCES

There would be a potential significant adverse impact to ~~certain architectural resources~~ the State and National Register (S/NR)-eligible Gowanus Canal Historic District due to demolition of ~~State and National Register (~~S/NR~~)~~-eligible properties on the Head End Site; this demolition is necessary to complete the Project as mandated by the U.S Environmental Protection Agency (USEPA). The Head End Site is located within the boundaries of a ~~proposed 2014~~ Gowanus Canal Historic District proposed for listing on the S/NR by SHPO in 2014 and determined S/NR-eligible in 2012. However in response to community comments, the New York State Board for Historic Preservation review for the State Register listing of the Gowanus Canal Historic District has been postponed. ~~that did not go forward but was subsequently determined S/NR-eligible by SHPO.~~ The Head End Site contains the buildings at 242-244 Nevins Street, 270 Nevins Street and 234 Butler Street (that include the two-story former Gowanus Station and associated one-story extensions on Butler and Nevins Streets) that contribute to the significance of the S/NR-eligible Gowanus Canal Historic District and SHPO has stated that their demolition would adversely affect the buildings and the Historic District. The New York City Department of Environmental Protection (DEP) has determined that demolition of these buildings would constitute a significant adverse impact to architectural resources on the Head End Site and to the S/NR-eligible Gowanus Canal Historic District pursuant to CEQR.

As the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from the U.S. Army Corps of Engineers [USACE] or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act of 1966. If USEPA, in consultation with SHPO, determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA in consultation with SHPO and the City, will seek ways to minimize or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition, and ~~Therefore, the New York City Department of Environmental Protection (DEP)~~ is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic façades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York City on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and the condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed CSO structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the façades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (~~; this documentation~~ which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential~~incorporate some ~~to~~ salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

CONSTRUCTION NOISE

Construction of the Project would be required to follow the *NYC Noise Control Code* for construction noise control measures. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *NYC Noise Control Code*. These measures could include a variety of source (i.e., reducing noise levels at the source or during the most sensitive time periods) and path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors). As discussed in Chapter 20, "Construction," even with these noise control measures, construction of the Project would result in potential temporary significant adverse noise impacts at existing residences at 282 and 285 Nevins Street (see Figure 20-20). Noise levels up to the mid-70s dBA were predicted to result from construction of the Project at these locations, resulting in noise level increases that would exceed *CEQR Technical Manual* impact criteria and absolute noise levels that would exceed *CEQR Technical Manual* noise exposure guidance at times throughout the construction of CP-2. While CP-1 and CP-3 construction ~~would be expected to~~ would result in ~~lower~~ noise levels less than or comparable to those associated with CP-2 ~~based on the lower levels of materials traveling to and from the site~~, noise levels from these construction phases ~~may~~ would, at times, exceed ~~these~~ the *CEQR Technical Manual* impact criteria but not the *CEQR Technical Manual* noise exposure guidance ~~during those periods as well~~. Because the analysis is based on worst-case construction phases, it does not capture the natural daily and hourly variability of construction noise at each receptor. The level of noise produced by construction fluctuates throughout the days and months of the construction phases, while the construction noise analysis is based on the worst-case time periods only, which is conservative.

The predicted noise exposure for the occupants of the residential buildings where potential significant temporary adverse construction noise impacts were identified would depend on the amount of façade noise attenuation provided by the buildings. The façade noise attenuation is a factor of the building façade construction as well as whether the building's windows are able to remain closed. Buildings that have an alternate means of ventilation (e.g., some form of air conditioning) are assumed to be able to maintain a closed-window condition, which results in a higher level of façade noise attenuation. The existing residential buildings at 282 and 285 Nevins Street appear, based on field observations, to be constructed with standard building façade construction including insulated glass windows along with an alternate means of ventilation (i.e., window air conditioners) allowing for the maintenance of a closed-window condition. This construction would be expected to provide approximately 25 dBA window/wall attenuation[1]. With such measures, the residences at 282 and 285 Nevins Street would be subject to interior noise levels during construction in the ~~high~~ mid 40s dBA, up to approximately ~~5~~2 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines. The provision of storm windows or other building façade improvements would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the building. Consequently, there would be no feasible or practical mitigation measures to reduce or avoid the predicted potential temporary significant adverse construction noise impacts at these receptors. ✷

[1] Interior noise levels would be 25 dBA less than exterior noise levels. Standard façade construction using insulated glass windows typically provides approximately 25-30 dBA window/wall attenuation.

Chapter 24: Unavoidable Adverse Impacts

A. INTRODUCTION

Following the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, this chapter summarizes potential significant adverse impacts that would be unavoidable if the Project is implemented regardless of the mitigation employed, or if mitigation is impossible.

As described below, potential unavoidable significant adverse impacts resulting from the Project have been identified for historic and cultural resource and noise during construction.

B. UNAVOIDABLE ADVERSE IMPACTS

HISTORIC AND CULTURAL RESOURCES

As described in Chapter 23, "Mitigation," the New York City Department of Environmental Protection (DEP) has determined that pursuant to CEQR, there would be a potential significant adverse impact to the State and National Register (S/NR)-eligible Gowanus Canal Historic District ~~certain architectural resources~~ due to demolition of S/NR-eligible properties on the Head End Site; this demolition is necessary to complete the Project as mandated by the U.S. Environmental Protection Agency (USEPA). As the Project is mandated by USEPA to satisfy remediation objectives under CERCLA (and would require permits from U.S. Army Corps of Engineers [USACE] or equivalencies from USEPA), the Project is subject to Section 106 of the National Historic Preservation Act of 1966. If USEPA, in consultation with the New York State Historic Preservation Office (SHPO), determines that the Project will have an adverse effect on historic properties pursuant to Section 106, USEPA in consultation with SHPO and the City, will seek ways to minimize or mitigate to the extent practicable any adverse effects to such properties through a Memorandum of Agreement.

Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition, and ~~The New York City Department of Environmental Protection (DEP)~~ is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street. Particular emphasis will be placed on 234 Butler Street, as this two-story building and its one-story extensions, collectively the former Gowanus Station, contributes to the history of the neighborhood and presents historic facades that include Beaux Arts style features and ornament including segmental window openings with scrolled keystones, and a gable that contains a decorative terra cotta panel and the Seal of New York City on the Nevins Street façade. The engineering analysis will assess the stability of the 234 Butler Street building's two- and one-story sections and condition of the building materials including ornamental features; review building code requirements with respect to modifying existing structures including seismic requirements and how these requirements may affect the need for structural framing upgrades if alterations and repairs would be made to 234 Butler Street; evaluate the relationship/overlap of the two- and one-story building sections and the proposed combined sewer overflow (CSO) structures and identify any issues associated with the retention of all or portions of the former Gowanus Station; and explore alternatives including retaining all or portions of the historic two- and one-story sections of the 234 Butler Street building on the site, temporarily relocating all or portions of the 234 Butler Street building, and exploring the potential for reconstruction of all or portions of the facades.

If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, it is expected that DEP under USEPA's supervision would identify and develop mitigation measures that would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with the SHPO and USEPA (which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would ~~explore the potential to~~incorporate some salvageable ~~any~~ significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

With these measures, the impact would be considered partially mitigated. As the potential significant adverse impact would not be fully mitigated, the proposed project would result in an unavoidable adverse impact on architectural resources.

CONSTRUCTION NOISE

As discussed in Chapter 23, "Mitigation," construction of the Project would be required to follow the *NYC Noise Control Code* for construction noise control measures. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *NYC Noise Control Code*. These measures could include a variety of source (i.e., reducing noise levels at the source or during the most sensitive time periods) and path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors). As discussed in Chapter 20, "Construction," even with these noise control measures, construction of the Project would result in potential temporary significant adverse noise impacts at existing residences at 282 and 285 Nevins Street (see Figure 20-20). Noise levels up to the mid-70s dBA were predicted to result from construction of the Project at these locations, resulting in noise level increases that would exceed *CEQR Technical Manual* impact criteria and absolute noise levels that would exceed *CEQR Technical Manual* noise exposure guidance at times throughout the construction of CP-2. While CP-1 and CP-3 construction would result ~~be expected to result~~ in ~~lower~~ noise levels ~~based on the lower levels of materials traveling to and from the site~~less than or comparable to those associated with CP-2, noise levels from these construction phases ~~may~~ would, at times, exceed the *CEQR Technical Manual* impact ~~these~~ criteria, but not the *CEQR Technical Manual* noise exposure guidance~~during those periods as well~~. Because the analysis is based on worst-case construction phases, it does not capture the natural daily and hourly variability of construction noise at each receptor. The level of noise produced by construction fluctuates throughout the days and months of the construction phases, while the construction noise analysis is based on the worst-case time periods only, which is conservative.

The predicted noise exposure for the occupants of the residential buildings where potential temporary significant adverse construction noise impacts were identified would depend on the amount of façade noise attenuation provided by the buildings. The façade noise attenuation is a factor of the building façade construction as well as whether the building's windows are able to remain closed. Buildings that have an alternate means of ventilation (e.g., some form of air conditioning) are assumed to be able to maintain a closed-window condition, which results in a higher level of façade noise attenuation. The existing residential buildings at 282 and 285 Nevins Street appear, based on field observations, to be constructed with standard building façade construction including insulated glass windows along with an alternate means of ventilation (i.e., window air conditioners) allowing for the maintenance of a closed-window condition. This construction would be expected to provide approximately 25 dBA window/wall attenuation[1]. With such measures, the residences at 282 and 285 Nevins Street would be subject to interior noise levels during construction in the ~~high~~ mid 40s dBA, up to approximately ~~5~~2 dBA higher than the 45 dBA threshold recommended for residential use according to the *CEQR Technical Manual* noise exposure guidelines. The provision of storm windows or other building façade improvements would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the building. Consequently, there would be no feasible or practical mitigation measures to reduce or avoid the predicted potential temporary significant adverse construction noise impacts at these receptors. ✷

[1] Interior noise levels would be 25 dBA less than exterior noise levels. Standard façade construction using insulated glass windows typically provides approximately 25-30 dBA window/wall attenuation.

Chapter 25: Growth-Inducing Aspects of the Project

A. INTRODUCTION

The term "growth-inducing aspects" generally refers to the potential for a project to trigger additional development in areas outside of the project site (i.e., outside the directly affected area) that would not experience such development without the project. The 2014 *City Environmental Quality Review (CEQR) Technical Manual* indicates that an analysis of the growth-inducing aspects of a project is appropriate when the project: (1) adds substantial new land use, new residents, or new employment that could induce additional development of a similar kind of land use or additional development of support uses (such as development of retail establishments to serve new residential units); and/or (2) introduces or greatly expands infrastructure capacity. As the Project would introduce new infrastructure (the combined sewer overflow [CSO] Facilities and related sewer improvements), an assessment of the Project's potential to induce additional development is warranted.

B. PROBABLE IMPACTS OF THE PROJECT

As described in Chapter 1, "Project Description," on September 27, 2013, the U.S. Environmental Protection Agency (USEPA) issued a Record of Decision (ROD) identifying actions to be undertaken by various parties to remediate contamination in the Canal, including remediation of industrial contamination within the Canal. As part of the ROD, USEPA mandated the design and construction of two CSO facilities.

In accordance with the USEPA ROD, DEP is designing and constructing two CSO facilities, an 8-million-gallon (MG) CSO Facility that would intercept overflow of CSO solids primarily from outfall RH-034 at the northernmost portion of the Canal and a 4-MG CSO Facility that would intercept overflow of CSO solids primarily from outfall OH-007 located at the middle of the Canal (approximately 0.5 miles south of the northernmost portion of the Canal) near the northern terminus of 2nd Avenue near the 4th Street turning basin.

Although the Project would include the construction of new sewer infrastructure, it would not result in an expansion of the sewer infrastructure capacity. Rather, the two CSO Facilities would divert existing flows and increase CSO capture for overflows into the Canal. The area that would be served by the Project is a long-developed part of Brooklyn that contains primarily commercial, light-industrial, and residential uses (see Chapter 2, "Land Use, Zoning, and Public Policy") and which is served by the existing combined sewer system; therefore, the Project would not result in an expansion of sewer infrastructure in an area that lacks sewer service, and would not result in induced development through new sewer service.

As noted in Chapter 2, "Land Use, Zoning, and Public Policy," independent of the Project, the Department of City Planning along with other City agencies initiated a comprehensive planning study of the Gowanus neighborhood in order to develop a future planning and land use framework for the area. Following completion of the planning study and framework, which will include further community feedback and input, implementation could include portions of the study areas being rezoned to allow for residential use, among other uses and goals of the study, which is not presently permitted by the existing zoning in the area. However, the planning study is currently in its preliminary stages and its outcome and where new residential uses might be permitted is currently unknown. As stated in Chapter 2, for the purposes of this

EIS, it is assumed that the existing zoning regulations and associated land use patterns and development trends applicable to the Head End Facility, the Owls Head Facility, and the study areas would remain in place in the 2028 analysis year. Any new residential development in the area near the CSO Facilities that may occur as a result of the potential rezoning would be independent of the Project. As noted above, the CSO Facilities are being designed with capacities to meet the requirements of the USEPA ROD. The CSO Facilities would not independently increase the sewer capacity available to potential new redevelopment and the Project would not induce new development.

In addition, as discussed in Chapter 3, "Socioeconomic Conditions," the CSO Facilities would not result in a significant increase in property values, which reflect a greater potential for redevelopment, because they are not introducing a substantial new use to the area that could considerably alter or accelerate existing market trends.

C. CONCLUSION

As outlined above, although the Project would include the construction of new sewer infrastructure, it would not result in an expansion of the sewer infrastructure capacity. In addition, the Project is not anticipated to induce additional development beyond the CSO Facilities' Project Sites. *

Chapter 26: Irreversible and Irretrievable Commitment of Resources

This chapter summarizes the Project and its potential impacts on the loss of environmental resources, both in the immediate future and in the long term. Resources, both natural and man-made, would be expended in the construction and operation of the Gowanus Canal Combined Sewer Overflow (CSO) Facilities (the Project). Certain resources would be irreversibly and irretrievably committed to the Project, such as land occupied by the Project; building materials used to construct the Project; energy in the form of fuel and electricity used in construction and operation of the Project, as well as the human effort (time and labor) required to develop, construct, and operate the Project. The commitment of resources and materials for the Project (e.g., land, building materials, energy in the form of fuel and electricity, and time and labor efforts) were weighed against the Project's purpose and need to conform to the U.S. Environmental Protection Agency (USEPA) Record of Decision (ROD) requirement to prevent recontamination of the Canal following the implementation of remedial actions.

As shown on Figures 1-13 and 1-16, the CSO Facilities would occupy a minimal amount of land, limited to portions of the Head End and Owls Head Sites. The Head End Site and the Owls Head Site were identified as the preferred sites due in large part to their locations adjacent to outfalls RH-034 and OH-007, respectively, which provide minimal distance for conveyance, resulting in a more efficient design and construction effort. Therefore, the Project would utilize the minimum amount of land necessary to construct the CSO Facilities and related conveyance as required by the USEPA mandate, and the Project would not constitute a significant commitment of land resources.

As discussed in Chapter 1, "Project Description," the Head End Facility and the Owls Head Facility would be largely automated and would not require permanent staffing. As discussed in Chapter 13, "Energy," the CSO Facilities are expected to be in operation approximately 40 to 50 times during a typical year and are estimated to require a total of approximately 10.5 million British Thermal Units (BTUs) per year (approximately 7 million BTUs at the Head End Facility and approximately 3.5 million BTUs at the Owls Head Facility). This energy consumption would be considered negligible in comparison to the approximately ~~376~~ 368 trillion BTUs provided by Con Edison within the New York City and Westchester County service area annually. Therefore, the Project would not result in a significant commitment of labor or energy resources.

As discussed in Chapter 16, "Greenhouse Gas Emissions and Climate Change," although construction of the Project would require a commitment of sustainable building materials, to the extent practicable, the Project would use materials with recycled content, including concrete and steel to reduce the intensity of carbon emissions related to construction. The Project would also evaluate the use of natural gas, a lower carbon fuel, and a roof-mounted photovoltaic system (solar power) for the normal operation of the heating, ventilation, and air conditioning (HVAC) systems.

In conclusion, the Project would utilize the minimum amount of land necessary and would result in a negligible commitment of other resources such as labor, energy, and building materials. In addition, the Project would meet the goals of the USEPA ROD. ✷

Chapter 27: Response to Comments on the Draft Environmental Impact Statement[1]

A. INTRODUCTION

This chapter of the Final Environmental Impact Statement (FEIS) summarizes and responds to substantive comments received during the public comment period for the Draft Environmental Impact Statement (DEIS) for the Gowanus Canal Combined Sewer Overflow (CSO) Facilities Project. A duly noticed public hearing on the DEIS was held on January 17, 2018 in Spector Hall at 22 Reade Street, New York, NY 10007. Public comments on the DEIS were accepted at the hearing and throughout the comment period, which remained open until January 29, 2018.

Section B lists the organizations and individuals that provided relevant comments on the DEIS. Section C contains a summary of these relevant comments and a response to each. These summaries convey the substance of the comments made, but do not necessarily quote the comments verbatim. Comments are organized by subject matter and generally parallel the chapter structure of the DEIS. Where more than one commenter expressed similar views, those comments have been grouped and addressed together. Written comments are included in **Appendix 27-1**, "Comments Received on the Draft Environmental Impact Statement."

B. LIST OF ORGANIZATIONS AND INDIVIDUALS WHO COMMENTED ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

AGENCIES[2]

1. Olivia Brazee, Historic Site Restoration Coordinator, New York State Historic Preservation Office, letter dated October 19, 2017 (SHPO_001)
2. Sarah Carroll, Executive Director, Landmarks Preservation Commission, letter dated November 29, 2017 (LPC_015)
3. Naim Rasheed, Senior Director, Traffic Engineering & Planning New York City Department of Transportation, letter dated September 22, 2017 (NYCDOT_002)

ORGANIZATIONS AND BUSINESSES

4. Sabine Aronowsky, Board Member, Friends of Thomas Greene Park and Program Manager, South Brooklyn Accountable Development Initiative, oral comments delivered January 17, 2018 (Aronowsky_Friends_011) and letter dated January 29, 2018 (Group_016)
5. Karen Blondel, Turning the Tide, oral comments delivered January 17, 2018 (Blondel_TurningTide_009)
6. Michael Higgins Jr., Organizer, Families United for Racial and Economic Equality, letter dated January 29, 2018 (Group_016)

[1] This chapter is new to the FEIS.

[2] Citations in parentheses refer to internal comment tracking annotations.

7. Diane Kruger, Horticultural Manager, Gowanus Canal Conservancy, oral comments delivered January 17, 2018 (Kruger_GCC_007)
8. Andrea Parker, Executive Director, Gowanus Canal Conservancy, letter dated January 29, 2018 (Group_016)
9. Rachel Spector, Director of the Environmental Justice Program, New York Lawyers for the Public Interest, oral comments delivered January 17, 2018 (Spector_008) and letter dated January 29, 2018 (Group_016)
10. Sue Wolfe, President, Friends of Thomas Greene Park, oral comments delivered January 17, 2018 (Wolfe_Friends_010) and letter dated January 29, 2018 (Group_016)

GENERAL PUBLIC

11. Janice Everett, oral comments delivered January 17, 2018 (Everett_013)
12. Peter Reich, oral comments delivered January 17, 2018 (Reich_012) and email dated January 29, 2018 (Reich_018)
13. Sal Tagliavia, oral comments delivered January 17, 2018 (Tagliavia_014)
14. David Yudelson, Sive, Paget & Riesel P.C., letter dated January 29, 2018 (SPR_017)

C. COMMENTS AND RESPONSES

CEQR PROCESS

Comment 1: The DEIS has determined that the acquisition of the privately owned parcels is the preferred alternative for siting of the CSO Facilities. However, the DEIS suffers from numerous fatal defects under both SEQRA and CEQR. Due to these deficiencies in information and analysis, the DEIS cannot serve its legally mandated purpose under SEQR and CEQR of providing a basis for fully informed public comment on the Project. Consequently, the DEIS must be revised and completed, and it is only at this point that the public will be able to discern the actual scope and nature of the Project's impacts. Until the revisions necessary to attain compliance with SEQRA and CEQR are completed, DEP may not take any action to advance the Project and no state permit or funding may be issued to the Project. (SPR_017)

Response: In accordance with New York City's Executive Order 91 of 1977 and its amendments establishing City Environmental Quality Review (CEQR), Article 8 of the Environmental Conservation Law establishing the State Environmental Quality Review Act (SEQRA) and its implementing regulations (6 NYCRR Part 617), the New York City Department of Environmental Protection (DEP), prepared this DEIS following the guidelines in the *CEQR Technical Manual* and in consultation with City and State agencies to determine the Project's potential significant adverse environmental impacts. In accordance with CEQR procedures, an FEIS has been prepared, which incorporates relevant comments on the DEIS and any updates to the analyses where warranted. Responses to specific comments on the DEIS analysis are provided below.

ANALYSIS FRAMEWORK

Comment 2: The EIS needs to address how to mitigate for the cumulative impacts from prolonged remediation and construction in and around Thomas Greene Park, as well as Urban Heat Island and other environmental justice issues that we have for the large number of nearby, lower income public housing residents, who also value this park. (Aronowsky_Friends_011)

Response: As discussed in Chapter 1 of the DEIS, "Project Description," independent of the Project, other parties are expected to undertake remediation activities in the area of the Thomas Greene Playground. In particular, National Grid may be required to undertake remediation activities within the Thomas Greene Playground, subject to a future enforcement order between the U.S. Environmental Protection Agency (USEPA) and National Grid, and in coordination with the New York State Department of Environmental Conservation (NYSDEC). National Grid's remediation is outside the scope of the Project, and at this time, there is not sufficient information available concerning National Grid's investigations and remediation to enable them to be considered in this environmental review. Therefore, the DEIS considers only the Project's potential environmental impacts, including the Project's potential open space impacts, consistent with the methodology of the *CEQR Technical Manual*. The DEIS finds that construction and operation of the Project would not result in any significant adverse impacts affecting the Thomas Greene Playground (see Chapter 5, "Open Space," and Chapter 20, "Construction"), therefore mitigation of impacts on the park is not warranted. The DEIS also finds that the Project would not result in disproportionate impacts on the potential environmental justice area located near the Head End Site (see Chapter 21, "Environmental Justice"). In addition, urban heat island effects are the result of neighborhood- and regional-scale conditions that are beyond the scope of the CEQR analysis of the Project.

Comment 3: It is improper to indicate that National Grid's MGP remediation plans are beyond the scope of the proposed project. Those remediation plans, including bulkhead work, and the proposed tanks are all part of the same Superfund remedy and are physically interrelated and dependent on one another. Thus, the scope of required remediation at all tank-related locations must be defined and how that work is integrated and sequenced with the tanks' construction is required in order to properly assess adverse impacts and mitigation in not only the hazardous materials chapter but also the construction and natural resource chapters. (SPR_017)

Response: The remediation that will be conducted by National Grid is not within the scope of this review, as the two actions are being performed by separate parties. The Head End Site is located within the boundaries of the former Fulton Municipal Works Manufactured Gas Plant (MGP) site which continues to be investigated and remediated by National Grid pursuant to Administrative Orders with NYSDEC and USEPA. Independent of the Project, the July 2015 NYSDEC Record of Decision (ROD) issued by NYSDEC for the former Fulton MGP site, specifies the remediation to be performed by National Grid at the Head End Site (which is a portion of the larger MGP site). Additional clean-up activities in the vicinity of the Canal, including the installation of bulkheads to support dredging in the Canal, containment walls to prevent contaminant migration, and the excavation or stabilization of much of the contamination on site, will be conducted by National Grid pursuant to Orders with USEPA. This work under the NYSDEC ROD and

USEPA ROD is not subject to review under CEQR. Furthermore, at this time, the specifics of National Grid's investigation and remedial action work are still being developed, and there is not sufficient information, such as the construction schedule and logistics, to enable it to be considered in this review.

PROJECT DESCRIPTION

Comment 4: The Gowanus Canal Conservancy (GCC) has operated a composting, stewardship, and education facility along with a native plant nursery at the Owls Head Site for the past seven years. We appreciate the City's intent to incorporate GCC into the long-term design of the site. We additional request that the City assist our organization in securing at temporary site for our uses that will be displaced during construction of the Owls Head Facility so that we may continue to offer community programming, open space stewardship, and compost production. (Kruger_GCC_007) (Group_016)

Response: As stated in the DEIS, DEP is coordinating with the New York City Department of Sanitation (DSNY) and GCC in the design of the Owls Head Facility, which is expected to accommodate all of the existing DSNY facilities on the Owls Head Site and to be accessible to GCC activities following construction of the Facility. DEP will continue to coordinate with DSNY on the siting of temporary replacement space for existing DSNY and GCC activities during construction of the Facility.

Comment 5: GCC urges the city to incorporate high quality open space and restoration areas of the Owls Head Facility that provide public access to the waterfront and increase habitat along this highly degraded waterway. Opportunities to do so include:

- Reconstruction of the bulkhead at Owls Head should consider soft edges to improve shoreline habitat. Strategies should be coordinated with the related Natural Resources Damages (NRD) legal settlement to mitigate loss of resources through restoration projects;
- At the dead end of 2nd Avenue, there is a garden and an access point for boaters that will be displaced with the reconstruction of the bulkhead. Since the OH-007 outfall will be moved to the west, there's an opportunity for the City to rebuild the street end as an educational amenity with a sponge park to soak up the stormwater and a reconstructed boat launch. (Group_016, Kruger_GCC_007)

Response: See the response to Comment 4. As stated in the DEIS, with the detailed design of the Owls Head Facility, space on the Owls Head Site could be made accessible to GCC, and this space may allow for a new access point to the water replacing the access point at the end of 2nd Avenue (see Chapter 5, "Open Space"). Construction of an open space area at the 2nd Avenue street-end is not anticipated to be part of the Owls Head Facility design, however, this area may be improved as part of a separate project following completion of the Project's bulkhead construction. Design of the new bulkhead will consider soft edges, future dredging activity in the Canal, Owls Head Facility construction, and long-term site use.

Comment 6: Construction of the tank at the Head End Site creates the opportunity to add publicly accessible open space to this area, which is sorely lacking in open space. This action presents an opportunity for the City to thoughtfully design a public facility for an environmental justice community that has been disproportionately impacted by the pollution in the Gowanus Canal, and is underserved in park access. We urge the City to consider the following:

- Consider how this public space design fits into the larger public space framework in the neighborhood, including a renovated Thomas Greene Park, probable shore public walkways created by private development, a potential Sponge Park on the Degraw Street end, and/or interpretive plaza surrounding the historic Pump House and Gate House;
- Host a community process to envision the design and programming of this facility and the city owned properties mentioned above;
- Park amenities for the top of the tank should include programs that include hardscape, such as a skatepark. This can allow more room in Thomas Greene Park for deeply permeable landscapes that can help manage stormwater;
- As the top of the tank is at least 50 feet above grade, develop a welcoming and accessible connection to the top of the tank. Consider turning Degraw Street between Nevins Street and the Canal into a New York City Department of Transportation (NYCDOT) plaza street to connect Thomas Greene Park to the waterfront with at-grade public space.
- Ensure that truck access points interfere as little as possible with public access to the waterfront and that the design maximizes park connectivity as well as CSO facility operations. Combine parking areas for DEP facilities to save space and allow a generous pedestrian entrance on Butler Street. (Group_016)

Given that the Gowanus neighborhood is lacking in green space, we agree with DEP's efforts and strongly encourage the City to maximize long term open space near the head of the Canal, including the setback area along the Canal and on top of the tank on the Head End Site, as well as on adjacent City-owned land. The City should convene a public design and visioning process with the community for these open spaces so that the community can really say what their open space needs are and what kind of access requirements would be beneficial at the Head End Site and the adjacent area, really stitching Thomas Green Park into the new open space at the Canal. (Kruger_GCC_007)

I'm looking for the Project to have more open space, particularly more shading to help with the heat because the area is all paved and it's extremely hot in the summer, and there's not a lot of open space there. So I'm asking that all of these parties continue to engage with the community. (Blondel_TurningTide_009)

On the Head End Site, where there will be some sort of park space, if it can't be a green park, there is a great opportunity for a skate park. (Aronowsky_Friends_011)

I would also like to urge you to fully consider designing the top of the completed CSO tank for more than strictly passive recreation. This is a tremendous opportunity to maximize use of the huge flat upper surface of the tank and transfer several recreational activities currently provided on the paved portions of Thomas Greene Park—specifically the skateboard park, handball courts, and perhaps even a small basketball court can be built on the tanks, while still allowing access to necessary rooftop access hatches. The goal here is to allow more of the full city block that is Thomas Greene Park to be reverted into an exceedingly large natural dirt and grass bioswale after its remediation by National Grid. This would contribute significantly to managing local storm water runoff before it gets to the sewers, and then into the new CSO tank. All in all, this move would help to extend the capacity of the tank without making it larger than currently designed, and would provide more much-needed welcoming functional green park space for the neighborhood. (Reich_018)

Response: As stated in the DEIS, the surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies, including review by New York City Parks and Recreation (NYC Parks). This design process will determine the public access and open space amenities that are feasible, safely accessible, and do not interfere with the operation of the Head End Facility. The top of the tank will only be approximately five feet above the sidewalk elevation at the Degraw Street and Nevins Street intersection (not 50 feet above grade as stated in the comment) and the grade difference would decrease toward the Butler Street and Nevins Street intersection, consistent with the slope of Nevins Street. The tank will be set back approximately 16 feet from the sidewalk, providing space to navigate the grade change with dynamic and visually interesting landscaping and access pathways—using the condition as an opportunity to bring visitors to the site graciously in a variety of ways (e.g., stairs or ramps). The tank will be designed to allow for support of additional soil depth for attractive planting on top of and along the sides of the tank. Construction of the Head End Facility does not require any modifications to the Thomas Greene Playground, and alterations to the park are not part of the Project.

Comment 7: We urge the City to consider integrating education and interpretation about Gowanus history, contamination, and sewage infrastructure into the Head End Facility, including:

- Incorporate the historic Gowanus Station building or façade into the design for the head house;
- Develop interpretive signage or site design to educate residents and visitors about the NYC sewage system, Gowanus hydrology, and the functions of the CSO tank, Flushing Tunnel, and the Pump Station.
- Demonstrate stormwater management through green infrastructure to encourage implementation through the Gowanus Watershed. (Group_016)

Response: As described in Chapter 7 of the DEIS, "Historic and Cultural Resources," DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street, with particular emphasis placed on 234 Butler Street. Consultation will continue with the New York State Historic Preservation Office (SHPO) regarding the engineering analysis and potential effects of the proposed project on architectural resources pursuant to Section 106. In addition, as noted above, the surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies, including review by NYC Parks.

Comment 8: I find it odd that there isn't going to be a biodigester with the Head End Facility as an added measure to the new tank. (Blondel_TurningTide_009)

Response: As stated in the DEIS, solids collected in the tanks at the CSO Facilities would be conveyed to the sewer system and would be treated at the Red Hook and Owls Head Wastewater Treatment Plants (WWTPs). The WWTPs currently provide the necessary treatment of organic solids. The CSO Facilities would also utilize a screening system to remove large debris and a degritting system to remove materials such as silt, sand, and gravels that collect in the tanks. The inorganic material collected by the screening and degritting systems would be discharged to a roll-off container for direct removal by trucks, and do not require any digestion. Therefore, on-site digester systems are not warranted for the Facilities and are not included in the Project.

Comment 9: I'm asking for public housing residents and local residents to be trained as a citizen emergency response team in regards to the cleanup and other issues in the area, similar to training programs administered by the federal, state, and local government. (Blondel_TurningTide_009)

Response: As stated in the DEIS, the Project is part of the mandated Superfund remediation of the Canal; USEPA operates a Superfund Job Training Initiative (SuperJTI) that provides free training and employment opportunities for citizens living in communities affected by Superfund sites. The Superfund JTI program is operated by USEPA and is not part of the Project, which is being undertaken by DEP.

Comment 10: Regarding the frequency of storms, what would happen if two storms happened back to back? (Blondel_TurningTide_009)

Response: As discussed in the DEIS, the Head End Facility and the Owls Head Facility include pump-back systems that are designed to return the full contents of the storage tanks to the sewer system (i.e., 8-MG at the Head End Facility and 4-MG at the Owls Head Facility) within 24 hours following a wet weather event to reduce the potential for odors and to allow the storage tanks to receive additional flow. If the tank is not full to capacity, pump-back would take less than 24 hours. If multiple storms occur within the time it takes to pump the contents back, and the flows to the facilities exceed the capacities of the tanks, the excess flows would pass through the Facilities and would discharge to the Canal via effluent weirs and effluent channels, which receives limited primary treatment via screening and settling. However, wet weather events that exceed the capacity of the tanks are expected to occur infrequently (approximately six times per year at the Head

End Facility and five times per year at the Owls Head Facility, out of approximately 40 to 50 wet weather events per year).

Comment 11: We understand that the storage tank will not capture 100 percent of the CSO discharge, and so we urge the City to consider investing in additional gray/green infrastructure upland of the Canal so that all of the neighborhoods that contribute to this overflow contribute by providing their fair share of infrastructure. (Kruger_GCC_007) (Group_016)

Response: As discussed in Chapter 1 of the DEIS, "Project Description," independent of the Project, DEP has undertaken several infrastructure improvement projects in the Canal's sewershed area. In particular, in the upland area, DEP has commenced construction and installation of High Level Storm Sewers (HLSS) and has invested in Green Infrastructure (GI) to reduce the amount of CSO that may reach the Canal. DEP will continue to monitor water quality in the Canal as part of the Gowanus Canal Long Term Control Plan (LTCP), which determined that the Canal's water quality standards (WQS) are being met as a result of the significant improvements already completed in the area, and concluded that water quality would further be improved with the build-out of GI and HLSS in the area.

Comment 12: We are concerned about the Thomas Greene Playground's pool, which will be out of commission because the tanks that are under it now have to be removed by National Grid. Then, if the land is approved across the street for the other tanks, there will be a problem, we think with air pollution and use of the pool. We've been told that both situations need to have a temporary replacement for the pool. There is currently a very large vacant Con Edison lot nearby and it's crying for some green space. We could have a temporary pool there which could last for a number of years. (Wolfe_Friends_010)

There needs to be an informed and funded plan for the seamless transition and provision of temporary park space, as well as the park reconstruction during the duration of the CSO tank construction and the Superfund cleanup. We would like the EIS to be more prescriptive about the potential impacts and costs of mitigation for the park and replacement of its amenities—the basketball courts, the skate park, and the swimming pool. (Aronowsky_Friends_011)

Response: See the response to Comment 2. The DEIS finds that construction and operation of the Project would not result in any significant adverse impacts affecting the Thomas Greene Playground (see Chapter 5, "Open Space," and Chapter 20, "Construction"), therefore mitigation of impacts on the park is not warranted. Under a separate agreement between USEPA and National Grid, and in coordination with NYSDEC, National Grid would be required to site and construct temporary park space to replace any park areas closed for remediation activities, and to restore any areas of the Thomas Greene Playground disturbed during remediation. The siting and design of the temporary park space is outside of the scope of the Project and this CEQR review.

Comment 13: When the tanks are built, the whole area above the new tanks will be raised eight or nine feet above ground, so that should be considered when this space is going to be used. (Wolfe_Friends_010)

Response: As stated in the DEIS, the surface layouts of both the Head End Facility and the Owls Head Facility are currently being designed, and the Project would incorporate public access areas where it is feasible and would not interfere with the operation of the CSO Facilities, in particular at the Head End Site. With construction of the below-grade tank structure, the area on top of the tanks would be raised above the grade of the adjacent sidewalks; this difference in elevation would vary, but is expected to be less than the eight or nine foot difference noted by the commenter. The landscaping and public access design will account for the difference in elevation to ensure that public access can be provided where appropriate.

Comment 14: We would love to see the construction staging parcel become permanent park space once the combined cleanups are finished. (Aronowsky_Friends_011)

Response: Reuse of the RH-034 Staging Area Property for public open space is not a part of the Project, which consists of the design and construction of the two CSO facilities, as mandated by the USEPA. The RH-034 Staging Area Property would be leased by DEP; following construction of the Head End Facility, the property would be returned back to its owner.

Comment 15: Debris removal from construction and operation of the CSO Facilities should be done on the water by barge. (Reich_012)

Response: As stated in the DEIS, barging is not expected to be used during operation of the CSO Facilities: grit removed from the tanks would be picked up by trucks by a waste hauling company, which would result in minimal and intermittent truck trips (see Chapter 14 of the DEIS, “Transportation”). DEP may evaluate the feasibility of barging for removal of construction debris during construction of the CSO Facilities with additional design and consultation with the selected construction manager. However, as discussed in Chapter 20 of the DEIS, “Construction,” construction of the CSO Facilities using trucks for removal of debris would not result in any significant adverse traffic impacts.

Comment 16: I am against siting the CSO Facility at the Head End Site instead of the alternative site at Thomas Greene Playground, which is USEPA’s preference. We know that the park will be dug up—why would you spend hundreds of millions of dollars to acquire the Head End Site property to dig another hole in the ground with the Canal right next to you? There’s a structural problem with the Canal and 8 MG tank being right next to each other. Also, we have a building on the property that’s over 100 years old and SHPO is trying to get it landmarked. (Tagliavia_014)

Response: As discussed in Chapter 1 of the DEIS, “Project Description,” the preferred location for the Head End Facility was determined through a focused site screening effort, which evaluated potential locations based on a variety of criteria, including engineering feasibility. The Site Recommendation Report recommended the Head End Canal-side Property as the location for the Head End Facility rather than the Thomas Greene Playground, due to a variety of factors (see the Fair Share Analysis prepared for the Head End Facility in Appendix 2-2 of the DEIS). In particular, the Head End Canal-side Property is located adjacent to the outfall and the Gowanus Wastewater Pumping Station and force main, and will therefore provide minimal distance for conveyance, resulting in a more efficient design and construction. In addition, constructing the Facility in Thomas Greene Playground would result in temporary and permanent displacement of park area, with the potential for parkland alienation. In particular, temporary relocation of the park would be needed and following completion of the Facility, some portion of the park would need to be reconstructed. In the 2016 Settlement Agreement, USEPA agreed with the findings of the Site Recommendation Report and directed DEP to construct the Head End Facility at the recommended location.

DEP has also conducted extensive investigations to characterize the site to ensure that the excavation support and foundation design will account for site-specific conditions including the proximity to the Canal.

As discussed in Chapter 7 of the DEIS, “Historic and Cultural Resources,” there are no individually designated or State and National Register (S/NR)-listed or eligible resources on the Head End Site. However, the buildings at 242 Nevins Street, 270 Nevins Street and 234 Nevins Street, have been identified as contributing to the significance of the S/NR-eligible Gowanus Canal Historic District, and demolition of these buildings would constitute a significant adverse impact to architectural resources on the Project Site and to the S/NR-eligible Gowanus Canal Historic District. Accordingly, DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition, as described below. If feasible, DEP would preserve the buildings or portions of one or more buildings. If not feasible, it is expected that DEP, under USEPA’s supervision, would identify and develop mitigation measures which would be anticipated to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA (which would be expected to include historical narratives, photographs, and inclusion of original or current building plans to the extent these drawings are available). In addition, if feasible, DEP would incorporate some salvageable significant architectural features of the buildings for reuse at the Head End Site or at another location. Consultation would continue with SHPO and USEPA regarding the development of such mitigation measures and agreed-upon mitigation measures would be expected to be set forth in a Memorandum of Agreement to be executed among USEPA, SHPO, and DEP.

LAND USE, ZONING, AND PUBLIC POLICY

Comment 17: The DEIS fails to incorporate into its projections the rezoning of the Gowanus neighborhood which is expected to occur in the near future as a result of DCP’s Gowanus PLACES Neighborhood Planning Study. The DEIS simply states that “the existing zoning regulations and associated current patterns and trends applicable to the Head End

Site, the Owls Head Site, and the study areas are assumed to remain in place in the 2028 analysis year." This is belied by the many clear indications that the zoning of the neighborhood is likely to change, perhaps as soon as next year. Among the goals of the study is developing land use proposals, including a rezoning, to promote increased housing in the Gowanus neighborhood.

Accordingly, the DEIS must analyze how this anticipated rezoning will affect and interact with the Project's effects across every category of SEQRA and CEQR impact. Critically, the DEIS must study how acquisition of the private parcels and the consequent elimination of their current manufacturing uses could, in conjunction with a likely rezoning, accelerate the de-industrialization of the neighborhood and the permanent loss of manufacturing uses. With respect to socioeconomic impacts and neighborhood character impacts, the DEIS must analyze how the preferred alternative's direct business displacements could similarly accelerate the process of displacement of other existing businesses and contribute to the alteration of the neighborhood's socioeconomic makeup. With respect to air quality and noise impacts, the DEIS must study how the potential odor and noise impacts of the Project would affect a rezoned neighborhood with a greater density of sensitive residential receptors clustered around the Project site and assess whether adequate mitigation measures can be deployed. For all of the quantitative impact categories like traffic, air and noise the future without the project baseline must assume a reasonable worst case increase in the density of residential, commercial and industrial uses. This increase in density and the associated increase in population, pedestrians, sensitive receptors, vehicle trips, emissions and public transportation trips must be accounted for. (SPR_017)

Response: The DEIS assessed the potential significant adverse impacts of the Project, which consists of the design and construction of the two CSO facilities, as mandated by USEPA to satisfy USEPA-established remediation objectives under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). The Gowanus PLACES study is a neighborhood planning study being conducted by the New York City Department of City Planning (DCP) independent of the Project and any subsequent discretionary actions (such as a rezoning action) will be subject to its own environmental review taking all appropriate known future information, including this Project, into account. At this time no rezoning of the Gowanus neighborhood has been proposed, and the location of potential new zoning districts permitting residential uses, if any, is not known. However, for the purposes of analysis, analysis receptors were placed at key locations identified as potential future residential development sites to conservatively evaluate the Project's effect on potential future land use changes (see Chapter 15, "Air Quality," and Chapter 20, "Construction") and background growth was incorporated into the analyses based on known projects expected to be completed by the Project's build year, as well as standard background growth rates, following CEQR methodology. At this time, the Gowanus PLACES study has not generated sufficient information to determine whether there would be any potential cumulative significant adverse impacts in this FEIS.

SOCIOECONOMIC CONDITIONS

Comment 18: As the DEIS notes, 19 businesses would be displaced by the construction of the tanks. We agree with the DEIS' conclusion that this does not represent a significant adverse impact because these businesses should be able to relocated to similar spaces in the vicinity, and are not solely dependent on the specific location for their business operations. In addition, we note that at the Head End Site, owners of the lots to be acquired by DEP have previously considered offers by developers to purchase the properties, which would similarly displace businesses. Nevertheless we believe DEP should, as mitigation, offer assistance to displaced businesses in finding alternative locations through collaboration with the Economic Development Corporation (EDC) and the Department of Small Business Services and the Final EIS should note the scope of such efforts. (Group_016)

Response: Concerning the relocation of existing property owners and their tenants, DEP has been proceeding with the goal of achieving a negotiated acquisition, and, as such, has been in discussions with the property owners and is currently working with the New York City Department of Small Business Services (SBS) and EDC to identify resources available in relocating the businesses on the Head End Site. If DEP is able to successfully purchase the Head End Site properties from willing sellers, the terms of the sale would include requiring the owners to deliver the site vacant at closing. With respect to the construction staging area for the Head End Facility, the City, through EDC, has been discussing relocation with Eastern Effects, a movie studio tenant on the staging site.

In the event a willing buyer/willing seller arrangement does not work out, the City would acquire the Head End Site parcel(s) by condemnation. In this case, DEP would work with the appropriate City agency to provide relocation assistance pursuant to the Rules of the City of New York Section 18-04. Such assistance may involve payments for actual reasonable expenses in moving. In addition, where needed, tenants can be provided with a broker to help search for a new site if desired. As noted in the DEIS, DEP will undertake Uniform Land Use Review Procedure (ULURP) for acquisition of the Owls Head Site properties at a different time; at that time, it is expected that similar assistance to existing businesses would be provided as appropriate.

Comment 19: An analysis of all impacts associated with the direct displacement of 19 businesses (some of which are vehicle intensive) is required. This analysis must look at reasonable relocation sites and the impacts that will be caused at the new locations. If there are no relocation sites then the loss of the business and their associated jobs and impact on community character must be assessed. The DEIS is incorrect in concluding that the unique businesses to be displaced (large vehicle related storage and services at both tank location sites) are available elsewhere on 3rd and 4th Avenues. To the contrary no comparable businesses that store and repair sanitation and tour bus vehicles on the scale required currently exist. (SPR_017)

Response: As discussed in Chapter 3 of the DEIS, "Socioeconomic Conditions," an analysis of potential impacts associated with direct business displacement was prepared in conformance with *CEQR Technical Manual* guidelines, which do not require the consideration of relocation sites or potential environmental impacts caused at potential new locations. As per the *CEQR Technical Manual* (page 5-6), an analysis should consider "whether the businesses to be displaced provide products or services essential to the local economy that would no longer be available in its 'trade area' to local residents or businesses due to the difficulty of either relocating the businesses or establishing new, comparable businesses." In this case, the analysis finds that alternative sources of goods, services, and employment are available within the socioeconomic study area or a reasonably proximal trade area, such that the exploration of relocation sites is not necessary for purposes of establishing the potential for significant adverse impacts under CEQR. While some existing automotive repair and maintenance businesses along 3rd and 4th Avenues may not have the ability to store and/or service all vehicle types serviced by certain potentially displaced businesses, these displaced businesses provide services for a market that is much larger than the study area. Study area businesses and the broader customer base of potentially displaced businesses are not uniquely dependent on these services being provided within the study area, and there are other locations elsewhere in the City, including near the study area, that would be able to accommodate these activities. Examples include: Coach Bus Repair (170 Van Brunt Street); International Truck Repair (111 58th Street); and New Millennium Motors (428 3rd Avenue). With respect to potential effects of the loss of businesses on community character, the analysis presents study area employment by sector, and considers the loss of the businesses and employment and associated potential effects on socioeconomic conditions.

HISTORIC AND CULTURAL RESOURCES

Comment 20: Based on our review of the project details to date, it appears feasible to retain and incorporate the historic former Gowanus Station building (234 Butler Street) into the project. This building, which has a prominent street presence at the corner of the city's preferred site, has overarching significance for the State/National Register-eligible Gowanus Canal Historic District. Its demolition would adversely affect both the building and the Historic District. To destroy this intact, architecturally distinctive example of Brooklyn's civic and industrial heritage would be a disservice to the Gowanus neighborhood and to the city as a whole. (SHPO_001)

We strongly encourage the project to take a hard look at retaining and preserving the building. It remains unclear why construction of the facility would necessitate demolition of the Gowanus Station, whose 1914 section occupies a relatively small footprint at the northeastern corner of the site. We find this DEIS inadequate for purposes of Section 106 consideration of alternatives, so we request a digital copy of the engineering analysis referred to therein. We may request further consideration of alternatives under Section 106, beyond this engineering analysis. (SHPO_001)

We believe the community goal to save the Gowanus Station building may be best achieved by siting the tank at the Head-of-Canal site. The property owner had previous development plans that did not include preserving the building, and there is no landmark designation in place to require preservation. As the DEIS notes, the city has the opportunity to thoughtfully integrate the building into the head house design. The FEIS should incorporate as much detail about these plans and opportunities as possible at this stage. (Group_016)

The DEIS states that "if feasible, some or all of the Gowanus Station building will be preserved or relocated. This type of generalized statement does not meet SEQRA and CEQR's requirements for clarity and specificity in developing mitigation options. A definitive analysis of the building's value as a cultural resource and the impacts of the proposed action must be undertaken as part of the DEIS. DEP may not defer the impact analysis and study of mitigation options until the FEIS or after the preferred alternative for the Project has been selected. (SPR_017)

Response: The DEIS identified the buildings on the Head End Site, including the former Gowanus Station building, as cultural resources as contributing properties in the S/NR-eligible Gowanus Canal Historic District, and disclosed that the Project would have a significant adverse impact on the S/NR-eligible Gowanus Canal Historic District. Consistent with 6 NYCRR Part 617.9(b(5)(iv) the DEIS provides a description of the anticipated mitigation measures and further states that consultation would continue with SHPO and USEPA regarding the development of mitigation measures, which are expected to be set forth in a Memorandum of Agreement among USEPA, SHPO, and DEP, pursuant to the Section 106 process.

As described in Chapter 7 of the DEIS, "Historic and Cultural Resources," DEP is performing an engineering analysis to identify challenges and opportunities associated with preserving all or portions of the existing buildings at 242-244 Nevins Street, 270 Nevins Street, and the two-story building and associated one-story extensions at 234 Butler Street, with particular emphasis placed on 234 Butler Street. Consultation will continue with SHPO regarding the engineering analysis and potential effects of the Project on architectural resources pursuant to Section 106. The FEIS includes additional discussion of historic resources to clarify that DEP has determined that the Project would have a significant adverse impact under CEQR and that DEP is evaluating the potential of retaining all or portions of the buildings on the Head End Site to minimize to the extent practicable the adverse impact that would occur through demolition. The FEIS further clarifies that it is expected that DEP, under USEPA's supervision, would identify and develop mitigation measures which would be expected to include documentation of the buildings as per recordation standards determined in consultation with SHPO and USEPA. In addition, if feasible DEP would incorporate some salvageable significant architectural features of the buildings for reuse of the Head End Site or at another location.

Comment 21: With respect to the possible effects to archaeological resources, for areas that have identified potential for deeply buried archaeological deposits, preliminary stratigraphic investigation (a geoarchaeological study) should be undertaken to assess the nature and extent of potentially culture-bearing deposits. The results of this investigation would provide the basis for determining whether further archaeological studies are needed and, if so, the most appropriate method for such work. (SHPO_001)

Response: As described in the DEIS, an archaeological monitoring plan will be prepared in consultation with New York City Landmarks Preservation Commission (LPC) and SHPO that will identify the horizontal and vertical locations of Project elements that have the potential to impact archaeological resources and will describe monitoring procedures, including an unanticipated discoveries plan. As part of development of this plan and once again prior to implementation of the plan, an archaeologist will review available information regarding Project site stratigraphy and subsurface conditions such as soil boring logs to determine the nature and extent of potential archaeological resources.

Comment 22: With respect to the status of 190 Butler Street, CRIS correctly shows that the building is a non-contributing building in the State/National Register-eligible Gowanus Canal Historic District. (SHPO_001)

Response: The initial note for this building in the Cultural Resources Information System (CRIS) identifies it as S/NR-eligible. However, in the eligibility notes for the building in CRIS the building is further identified as Non-Contributing. Since SHPO has confirmed that the building at 190 Butler Street is a Non-Contributing building to the S/NR-eligible Gowanus Canal Historic District, this building has been removed as an individual architectural resource from the FEIS.

Comment 23: We have no concerns with the demolition of the Owls Head properties (122 5th Street and 22 2nd Avenue) because, as stated previously, these structures do not contribute to the Gowanus Canal Historic District. (SHPO_001)

Response: Comment noted.

Comment 24: In reviewing the Project, LPC notes that the existing buildings on the Head End Site (234 Butler Street, 242-244 Nevins Street, and 270 Nevins Street) are located in the S/NR-eligible Gowanus Canal Historic District. The LPC did not identify these properties as LPC eligible. The LPC did identify a building in the study area as LPC eligible (the Pumping Station, aka Flushing Tunnel Building, located at 201 Douglass Street). LPC continues to evaluate the area for potential historic resources. (LPC_015)

Response: The description in the FEIS has been updated to include LPC's determination regarding LPC eligibility of the properties at 234 Butler Street, 242-244 Nevins Street, and 270 Nevins Street. The Pumping Station was previously identified in the DEIS as LPC (New York City Landmark)-eligible.

TRANSPORTATION

Comment 25: Based on our review of the Level I (Trip Generation) screening assessment of the operation scenario, we concur with the lead agency's determination that detailed traffic and pedestrian analyses are not warranted. (NYCDOT_002)

Response: Comment noted.

AIR QUALITY

Comment 26: With the above-ground screening system, how long will material sit in the screens? Is it going to dry and then become airborne? (Blondel_TurningTide_009)

Response: The material would not sit on the screens. The Facilities' screening systems are designed with a self-cleaning rake that will scrape trapped material off of the racks and deposit them in the Facilities' roll-off container (see Chapter 1 of the DEIS, "Project Description"). Removal of the container is expected to occur within a day or two after a wet weather event. Both the screens and the container would be enclosed within the Facilities' above-ground structure, which would be treated by the odor control system. As discussed in Chapter 15 of the DEIS, "Air Quality," emissions from the odor control system would not result in any significant adverse odor impacts at either Facility.

Comment 27: The DEIS states that the anticipated concentrations of hydrogen sulfide in the air will not exceed the 1 ppb significant odor threshold for sensitive receptors. However it lacks information to help the community understand a) what the odor control system components are and how it will function, b) what if any "spikes" in odor may occur during maintenance and other cleaning events, and c) what the level of "rotten egg" or sewage odor that is anticipated (the 0.75 ppb) will actually smell like in the vicinity. While the DEIS mentions odor levels at the nearby future hotel site, it doesn't mention odors at Thomas Greene Park next door. The FEIS should include additional information about anticipated odors. (Group_016)

Response: As described in Chapter 1 of the DEIS, "Project Description," DEP would provide an odor control system at both Facilities to control any potential odors from Facility operations. The odor control system at each Facility consists of multiple activated carbon odor control units to absorb odorous compounds from air ventilated from within the Facility before being exhausted to the atmosphere through a single exhaust stack. The systems are being designed according to industry standards to achieve a specified H_2S exhaust concentration of 25 parts per billion (ppb). This is the standard for wastewater treatment operations; CSO operations are expected to have an even lower exhaust concentration since the influent into the odor control systems are much more dilute. The systems are being designed with redundancy measures. The odor control system at each site is designed such that one odor control unit is available as a stand-by unit.

In addition, the Facilities are being designed with overall redundancy measures: backup measures would be provided to maintain odor control systems during a localized power outage and to maintain operations during maintenance activities. The design of the Facilities includes three separate power feeds to the facility. In the event of an outage, back-up power will be provided through one of the two secondary feeds. The odor control system will operate continuously (i.e., 24 hours per day), including during maintenance and cleaning activities. As discussed in Chapter 15, "Air Quality," the criteria used to assess odor impacts are the City's 2014 *CEQR Technical Manual* odor threshold of 1 ppb for H_2S at sensitive receptors, and the New York State Ambient Air Quality Standard (NYSAAQS) of 10 ppb of hydrogen sulfide (H_2S) in ambient air (both

1-hour average concentrations). Implicit in the use of 1 ppb H_2S as the significant odor threshold is that any control measures that may be needed to achieve this threshold will at the same time address other residual odors that are common to CSO storage facility operations. This level is extremely low, and is at the lowest end of the detection range of currently available monitoring technology. The maximum predicted cumulative odor concentration that is anticipated at ground level locations (including sidewalk locations and the nearby Thomas Greene Park) would be 0.11 ppb—well below the maximum predicted odor concentration of 0.75 ppb, the 1 ppb threshold at sensitive receptors, and the 10 ppb standard in ambient air.

CONSTRUCTION IMPACTS

Comment 28: Based on our review of the Level I (Trip Generation) screening assessment of the construction scenario, we concur with the lead agency's determination that detailed traffic and pedestrian analyses are not warranted. The Office of Construction, Mitigation and coordination would provide stipulation to maintain pedestrian and vehicular safety and mobility during construction.

Response: Comment noted.

Comment 29: The DEIS estimates an additional 200 truck trips per day during construction, which is a very high number over a long period of time—particularly when there is a park across the street heavily used by families with young children during peak months. The FEIS must include more information about possible ways of reducing this truck traffic, as well as about safety measures for families using the park. (Group_016)

Response: The daily truck trips presented in the DEIS are conservative estimates of the number of trips that could occur during peak construction, which is anticipated to be between the 3rd quarter of 2023 and the 1st quarter of 2024. During other periods of construction, the projected truck trips would be comparatively lower. Furthermore, these trips would be distributed throughout the day and are not expected to concentrate in any single hour. They would also be split between the Head End and Owls Head Sites, resulting in up to 100 daily trucks (maximum of 10 per hour) accessing/egressing each site. The maximum number of incremental vehicle trips for any particular intersection during a peak hour was estimated to be less than the *CEQR Technical Manual* threshold of 50 peak hour vehicle trips requiring a quantified analysis, however a detailed traffic analysis was prepared to assess the effects of the project construction activities on selected intersections near the Project sites, which did not identify any significant adverse impacts.

Given the configuration of the roadway network, the expected locations of site access and egress, and the NYCDOT-designated truck routes, truck trips between the two sites would not overlap through any intersection adjacent to the Thomas Greene Park. The trucks accessing/egressing the Head End Site would be concentrated along Nevins Street, Sackett Street, and 3rd Avenue, with no trucks expected on Douglass Street or Degraw Street, adjacent to the park's pedestrian access/egress locations. As a result, there is expected to be minimal exposure of pedestrians accessing/egressing the park to construction trucks in connection with the proposed project. Appropriate protection around the construction sites would be provided in accordance with requirements of the NYCDOT's Office of Construction Mitigation and Coordination (OCMC) to ensure the safety of surrounding motorists and pedestrians.

Comment 30: The DEIS assumes that Thomas Greene Park will be open during the construction period for the Head End Facility, although that's somewhat up in the air depending on the timing of the remediation of the park, which is going to be done by National Grid. But assuming that the park will be open during construction, I think that we need more analysis of the impacts on the park from construction across the street. With noise, there will be significant adverse impacts during construction, but it's important to fully understand the basis for the conclusion that current noise levels at the park are already high. (Spector_008)

We are surprised that the DEIS estimates existing background noise levels at Thomas Greene Park to be so high that the noise generated from construction would not be a problem at the park, if the park will in fact be open during construction and the pool in use, lifeguards and others will need to be able to hear as a safety measure. The FEIS should consider noise impacts to park users as well as to residents near the staging area. (Group_016)

Response: A detailed analysis and treatment of construction noise at the Thomas Greene Park is provided on page 20-63 of Chapter 20 in the DEIS. As described in Chapter 20, page 20-63, construction of the Project will not result in significant adverse impacts at the Thomas Greene Playground. Table 20-33 presents measured existing noise levels at the Thomas Greene Playground, represented by measurement Locations 10 and 35P. Playground and Pool occupants were the dominant noise source at Location 35P, while vehicular traffic on adjacent roadways and mechanical equipment noise from nearby industrial facilities were the dominant noise sources at Location 10. While the measured existing noise levels at the Thomas Greene Playground already exceed the *CEQR Technical Manual* guidelines for outdoor areas requiring serenity and quiet, such as passive open spaces, the CEQR guidelines are often not achieved due to the level of activity on the surrounding streets at most New York City open space areas and parks.

The DEIS notes that total construction noise levels at the western portion of the Thomas Greene Playground would be noticeable and potentially intrusive during the most intensive construction activities but would still be in the typical range for the Gowanus Canal area, as demonstrated by the noise levels measured at Location 10. Further, the western portion of the Playground, which is used primarily for active recreation, is not as sensitive to noise as purely passive open spaces and therefore would not rise to the level of significant adverse impact. Total noise levels during construction at the Douglass and DeGraw Pool would be comparable to those when the Pool is in use, as demonstrated by the noise levels measured at Location 35P, and would similarly not rise to the level of significant adverse impact. Based on the measured noise levels at the Pool when the Pool is in use, the maximum predicted noise levels generated by construction of the Project would not be expected to interfere with spoken communication for Pool staff or users.

Finally, noise level increases due to construction of the Project at the remainder of the Park (i.e. the passive recreation areas in the eastern portion of the Playground) would remain below the *CEQR Technical Manual* screening level impact threshold of 3 to 5 dBA (A-weighted decibels).

The DEIS also presents detailed predictions of construction noise effects associated with the Project at several discrete residential locations surrounding the Project work areas beginning on page 20-56. The analysis describes the magnitude of predicted construction noise levels as well as the duration of construction noise at each group of noise receptors, including residences.

Comment 31: We need more information in the FEIS about potential spikes in particulate matter and other harmful pollutants in the Thomas Greene Playground during construction of the Head End Facility, particularly given the nature of contamination at the site. (Spector_008)

We are concerned about the potential for high levels of certain pollutants to an intermittent basis, such as NO_2, during certain peak construction phases. The FEIS should include more detail about this possibility as well as consider closing Thomas Greene Park and providing a temporary park facility as a mitigation measure during these peak construction phases. (Group_016)

Response: Measures would be implemented during construction of the Project to reduce pollutant emissions, including the use of dust control, ultra-low sulfur diesel (ULSD) fuel, best available tailpipe technologies, and idling restrictions. Construction effects are temporary in nature and would not persist at a single location. The monthly and annual variation in the types of equipment needed on the construction site and the utilization of the equipment would fluctuate on an hourly basis. In addition, while the overall construction duration for the Project is expected to be approximately seven years, the construction duration for the most intense activities in terms of air quality, support of excavation (SOE) and excavation construction stages is anticipated to be limited to a portion of the duration—approximately two years. Other stages of construction would result in much lower air emissions since they would involve less intense activities and would require fewer pieces of heavy duty diesel equipment.

Nevertheless, as presented in Chapter 20 of the DEIS, “Construction,” a comprehensive analysis was performed to assesses the potential for significant adverse impacts from construction sources of air emissions generated during the peak construction periods of the Project on nearby publicly accessible locations, including the Thomas Greene Playground. The emission sources assessed in the analysis included those from equipment operating on-site such as excavators, on-road vehicles such as construction delivery trucks, dust-generating activities such as truck loading and unloading operations, and the groundwater treatment process. The pollutants analyzed for the construction period included nitrogen dioxide (NO_2), respirable particulate matter (PM) [both $PM_{2.5}$ and PM_{10}], and carbon monoxide (CO) as well as non-criteria pollutants such as benzene, toluene, ethylbenzene, and xylene (BTEX) from the groundwater treatment process. The analysis concluded that construction of the Project would not result in any predicted pollutant concentrations above the applicable thresholds. Therefore, no significant adverse air quality impacts are predicted from the construction of the Project.

Comment 32: I'm concerned about the impacts on my building, 280 Nevins Street—the noise and the air pollution and particularly the vibration and the digging there, because it's a very old building. It's vulnerable. I just hope it's not going to fall down. I would also ask for a consideration of work schedules, maybe not on the weekend or evenings and early morning. (Everett_013)

Response: As described in Chapter 20 of the DEIS, "Construction," measures would be implemented during construction of the Project to reduce pollutant emissions, including the use of dust control, ULSD fuel, best available tailpipe technologies, and idling restrictions. As demonstrated by the detailed construction air quality analysis presented in the chapter, with the implementation of these measures, no significant adverse air quality impacts are predicted from the construction of the Project.

Receptor 37 in the DEIS construction noise analysis represents 280 Nevins Street (referred to as 282 Nevins Street in the DEIS), and the results of the analysis are presented on Page 20-56. The DEIS identifies the potential for a significant adverse noise impact at this receptor during construction at the Head End Site. The Project is committed to implementing noise control measures, as described on Page 20-48 of the DEIS, to reduce the noise levels at Receptor 37 to the extent feasible and practicable.

In addition, the revised New York City Noise Control Code will include more stringent requirements for construction noise occurring outside of typical work hours (i.e., outside of Monday to Friday between the hours of 7 AM and 6 PM). Any construction associated with the Project occurring outside of the normal work hours will be required to meet these more stringent requirements. Consequently, construction associated with the Project will be required to produce increases in noise level at residential receptors with closed windows of no more than 8 dBA or 7 dBA after January 1, 2020. Furthermore, construction associated with the Project will be required to produce total outdoor noise levels at residential receptors no greater than 80 dBA or 75 dBA after January 1, 2020. These more stringent requirements will ensure lower noise levels resulting from off-hour construction noise associated with the Project than would be allowable under the current Code requirements.

As discussed in Chapter 20 of the DEIS, "Construction," the most vibration-intensive construction activity associated with the Project would occur at such distances from these buildings that vibration levels at these buildings would be below the level that would potentially result in architectural or structural damage. However, where appropriate, DEP may require the contractor to provide vibration monitoring of all residential buildings or other buildings sensitive to vibration within 90 feet of the Project Sites.

In addition, as noted in the chapter, the construction activities for the Project would be conducted during permissible construction hours in accordance with New York City laws and regulations which limit work to the hours between 7 AM to 6 PM on weekdays. The

Project construction schedule assumes that construction activities would typically occur in one 10-hour shift from 7 AM to 5 PM, five days a week on weekdays with the potential for some work on weekends to make up for weather delays and/or to accelerate the project construction schedule as determined by the construction contractor. Appropriate work permits from the New York City Department of Buildings (DOB) would be obtained for any necessary work outside of the permissible construction hours (7 AM to 6 PM on weekdays) for weekend or night work before work commences.

Comment 33: The construction calendar included in Figure 20-2 envisions eight full years of construction activity for each tank. This is an extraordinarily long period of time for the significant disruptions anticipated, and longer than DEP has previously estimated to USEPA and the public. The FEIS should include further explanation of the construction timeline, including comparisons to similar projects DEP has undertaken in the past. (Group_016)

Response: The construction schedule presented in the DEIS was developed by project designers that have extensive experience in tank construction and conveyance work through the city. Construction activities are considered temporary in nature. DEP construction activities at the Head End Facility are expected to take approximately seven years, with additional time (assumed to be one year) expected to be required for site remediation by National Grid. The overall construction duration for the Project is largely due to site constraints with limited space for truck deliveries and equipment staging. Multi-year construction schedules are not uncommon for comparable DEP facilities. The construction duration for the most intense activities, SOE and the excavation stage of construction, is anticipated to be limited to only a portion of the duration (approximately two years).

MITIGATION

Comment 34: Given the high levels of noise anticipated from the project, we are concerned about the lack of appropriate mitigation included in the DEIS. Further detail about the periods of time during which noise will be high should be included in the FEIS, along with more discussion of possible mitigation measures. (Group_016)

Response: The DEIS, on page 20-48 of Chapter 20, “Construction,” describes several noise reduction measures that would be incorporated into the Project to reduce the amount of noise that would occur at surrounding noise receptors. These include source controls (e.g., limits of equipment noise emission, use of electric equipment where feasible, proper maintenance of equipment) as well as path controls (e.g., noise barriers, placement of equipment). Notwithstanding these measures, the construction noise analysis predicts high levels of construction noise at some receptors in the vicinity of the Project work areas. For the locations where the magnitude and duration of predicted construction noise was determined to rise to the level of a significant impact, a discussion of potential mitigation measures is presented in Chapter 23, “Mitigation,” of the DEIS. As described in that chapter, at the residences predicted to experience temporary significant adverse construction noise impacts, interior noise levels would be marginally higher (up to 2 dBA) than the recommended interior noise levels for residential use according to the

CEQR Technical Manual. Building façade improvements would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the building

Comment 35: We have concerns about impacts during the period of construction of the tank and urge DEP to further elaborate on mitigation strategies in its FEIS. We remain concerned about the projected time frame for remediation and construction, particularly in terms of impacts to Thomas Greene Park. As the impacts of the construction, including noise and odors, will be felt most acutely in the western half of the Park, there must be a clear plan and funding for mitigation of these impacts at the site, or replacement amenities at a temporary location. As this half of the park will also need to be remediated, schedules and actions should be coordinated to minimize the length of time the park will be closed and to ensure that park users not be exposed to noise, odors and contaminated materials to be excavated from the site. One possibility is for DEP to coordinate with National Grid so that peak construction periods at the site will be simultaneous with the period of time that National Grid will be closing Thomas Greene Park for remediation and reconstruction. (Group_016)

DEP should explore additional possible noise mitigation measures for the Thomas Greene Playground to ensure that people aren't dissuaded from using the park during construction of the Head End Facility, assuming that the park is open. (Spector_008)

Response: The DEIS concluded that construction of the Project would not have the potential to result in a significant adverse impact at the Thomas Greene Playground (see response to Comment 30 above). While noise levels during construction may at times be noticeable and potentially intrusive, maximum construction noise levels would occur at the active recreation areas at the western portion of the site, and would be comparable to existing noise levels during Playground activity such as Pool occupancy. Also, as described in the DEIS, the magnitude of noise level increases due to construction at the remainder of the Playground would not rise to the level of a significant adverse impact during weekdays. However, construction noise would be more noticeable and potentially intrusive during occasional weekend work, when existing noise levels are lower, producing up to approximately 10 dBA increments above ambient noise levels for approximately 10 months. During the remaining months, construction would produce noise level increments of up to 6 dBA above ambient during the weekend.

Noise levels during weekends and weekdays at the Playground would be comparable to existing noise levels at other handball courts and active recreation areas in New York City in proximity to heavily trafficked roadways and other urban noise sources. While construction noise levels at the Playground would be noticeable and potentially intrusive at times, maximum construction noise levels would occur for a relatively short duration. Further, the highest noise levels were predicted at primarily active recreation areas, which are less sensitive to noise than purely passive open space areas.

As presented in the DEIS, DEP has committed to implementing a variety of measures during construction to minimize the effects of the Project on the nearby community, including an air pollutant emissions reduction program, hazardous materials handling protocols, noise mitigation measures, and tree protection, replacement and/or restitution plans. With the implementation of these measures, the construction effects of the Project on the surrounding area would be substantially reduced.

Comment 36: I live at 280 Nevins Street, which is the closest residential structure to the construction site. I want to be absolutely certain that everything is done to mitigate noise with the construction. The DEIS is predicting upwards of 70 decibels, which they say is really, really loud. We've been told that triple glazing on the north wall of our building will help to mitigate some of the noise. (Reich_012)

I ask that there be a concerted effort made to mitigate noise and vibration during the whole demolition and construction process. I speak for all of the live/work artists in residence and tenants of 280 and 285 Nevins Street, the two buildings singled out in the DEIS as most likely to be impacted by this project. (Reich_018)

Response: Receptors 36 and 37 in the DEIS construction noise analysis represent 285 Nevins Street and 280 Nevins Street (referred to as 282 Nevins Street in the DEIS), respectively. The results of the analysis are presented on Page 20-56. The DEIS identifies the potential for a significant adverse noise impact at these receptors during construction at the Head End Site. During the loudest periods of construction, interior noise levels would be marginally higher than the recommended interior noise levels recommended for residential use according to the *CEQR Technical Manual*. These noise levels would occur during peak truck activity at the lot immediately adjacent to these buildings. As discussed in Chapter 23 "Mitigation," building façade improvements, such as triple glazed windows, would not provide substantial improvement in the amount of façade attenuation or reduction in interior noise levels, because the window air conditioners, which are necessary to maintain the closed-window condition, would remain as a pathway for construction noise to enter the buildings. Noise levels greater than 70 dBA would be comparable to existing noise levels measured at the corner of 3rd Avenue and Union Street, which are in the low 70s dBA. While construction noise levels would at times result in marginally unacceptable interior noise levels, the noise levels will be similar to those that already exist in the neighborhood.

In addition, the revised New York City Noise Control Code will include more stringent requirements for construction noise occurring outside of typical work hours (i.e., outside of Monday to Friday between the hours of 7 AM and 6 PM). Any construction associated with the Project occurring outside of the normal work hours will be required to meet these more stringent requirements. Consequently, construction associated with the Project will be required to produce increases in noise level at residential receptors with closed windows of no more than 8 dBA or 7 dBA after January 1, 2020. Furthermore, construction associated with the Project will be required to produce total outdoor noise levels at residential receptors no greater than 80 dBA or 75 dBA after January 1, 2020. These more stringent requirements will ensure lower noise levels resulting from off-hour construction noise associated with the Project than would be allowable under the current Code requirements.

As discussed in Chapter 20 of the DEIS, “Construction,” the most vibration-intensive construction activity associated with the Project would occur at such distances from these buildings that vibration levels at these buildings would be below the level that would potentially result in architectural or structural damage. However, where appropriate, DEP may require the contractor to provide vibration monitoring of all residential buildings or other buildings sensitive to vibration within 90 feet of the Project Sites.

ALTERNATIVES

Comment 37: We agree with some of the conclusions of the Park Property Alternative assessment, however we note that increasing waterfront access at the expense of historic resources is not a valid consideration in this instance. Historically, the Gowanus Canal was lined with the industrial buildings and infrastructure that it was built to serve, and this continues to be its character today. Therefore, we feel that removing historic buildings along its edge is not justified by furthering citywide goals of increased public waterfront access. It is SHPO’s opinion that the Park Property Alternative represents the least impact to historic resources, as well as the most opportunity to satisfy a variety of land use requirements and public benefits, and for that reason this alternative should be more seriously considered. (SHPO_001)

The DEIS contains an inadequate comparative analysis of Project alternatives. The DEIS should full and transparently analyze the cost of the City of each of the alternatives, and the selection of the preferred alternative should be informed by cost. This is required in order for the leady agency undertaken the socioeconomic balancing required by CEQR and SEQRA. The acquisition of the privately-owned parcels for the DEIS’ preferred Head End Site would be far more expensive for the City than the use of the Thomas Greene Park site which the City already owns. The DEIS fails to engage in analysis of these costs.

The DEIS alternatives analysis must also include in its weighing of alternatives the consideration that, during the Project’s duration, National Grid will need to remediate the MGP site underlying the Thomas Greene Park, which will necessitate closing and excavating it. If the CSO tanks were to be sited in the park, their construction could be coordinated with the MGP remediation, likely accelerating remediation. This would halt the contaminants’ ongoing seepage into the Canal more quickly, a public health and environmental safety consideration which the DEIS must engage with. (SPR_017)

Response: The analysis of alternatives to the Head End and Owls Head Facilities was performed in accordance with CEQR requirements, which do not require consideration of the relative costs. Furthermore, the purpose of the alternatives analysis is to compare reasonable and feasible options that may avoid or reduce project-related significant adverse impacts, and is not to identify a preferred alternative. As described in Chapter 1 of the DEIS, “Project Description,” as part of the Superfund process, DEP prepared a siting and planning study for the two CSO facilities. This effort included: (1) identification and evaluation of CSO facility components and development of facility footprints to be used in the identification of viable sites on which to locate the facilities, including the CSO tanks, conveyance, and associated infrastructure; and (2) identification of potential sites suitable for locating the CSO facilities, development and evaluation of a shortlist of potential sites, and preparation of conceptual designs associated with those sites.

A focused site screening effort was conducted to identify potential sites for locating the facilities, based on three critical criteria: size of available property; hydraulic analyses and effective capture of CSO; and current or planned land use in the area. The Site Recommendation Report for the Head End Facility evaluated two potential "shortlisted" sites for the Head End Facility—the Head End Canal-side Property, comprised of two privately owned parcels located at 242 Nevins Street and 234 Butler Street, and the Park Property, comprised of the City-owned Thomas Greene Playground property—and recommended the Head End Canal-side Property as the location for the Facility. This recommendation also included use of the privately owned parcel at 270 Nevins Street for construction staging, referred to as the RH-034 Staging Area Property. The Site Recommendation Report for the Owls Head Facility recommended the use of a City-owned parcel of land located at 5th Street and 2nd Avenue, together with adjoining privately owned parcels along 5th Street, collectively referred to as the Owls Head Site.

On June 9, 2016, USEPA issued an Administrative Settlement Agreement and Order for Remedial Design, Removal Action and Cost Recovery (Settlement Agreement) directing DEP to construct the Head End Facility at the recommended location. In the Settlement Agreement, USEPA also agreed with DEP's recommended site for the Owls Head Facility. See also the responses to Comment 3 and Comment 16.

Comment 38: For each location an alternative must be considered that assumes the parcels necessary for staging are available to DEP for use for staging without permanent fee title acquisition by the City. (SPR_017)

Response: As noted above, the DEIS included analysis of alternatives to compare reasonable and feasible options that may avoid or reduce project-related significant adverse impacts. The Project would not require the permanent acquisition of any properties solely for construction staging. In particular, at the Owls Head Site, DEP must acquire up to four parcels. Temporary leasing of a portion of the site for only construction staging is not feasible, as the site design of the Owls Head Facility will accommodate the existing DSNY facility on a permanent basis. At the Head End Site, the RH-034 Staging Area Property would be leased by DEP; following construction of the Head End Facility, the property would be returned back to its owner.

Comment 39: We noted that the properties located at the 6th Street Alternative site (141 6th Street/aka 27-31 2nd Avenue) are contributing resources to the S/NR-eligible Gowanus Canal Historic District, and therefore their removal would adversely affect the buildings and the historic district. (SHPO_001)

Response: The eighteen reinforced concrete coal storage silos (Burns Brothers Coal Pockets) and a two-story building at 163 6th Street previously located on the site and as described in the 2013 Draft National Register Nomination Form for the Gowanus Canal Historic District were demolished by the previous owner. This has been noted in Chapter 22, "Alternatives."

Comment 40: We agree with DEP and many others who have supported siting the CSO tank at the Head End Site as opposed to in the Thomas Greene Playground. Siting the tank in the park would permanently displace over 30,000 square feet of park space to construct the Facility's head house, and over 50,000 square feet of park space to construct the tank. This neighborhood needs more open space, not less. (Kruger_GCC_007)

We support the site acquisition for the Head End Facility, and we strongly agree with the conclusion in the DEIS that the alternative site beneath Thomas Greene Park would result in far greater negative environmental impacts, particularly the loss of about one-third of the existing park for the head house, which is a significant loss in an area severely lacking in open space. While it's possible that there can be some open space reconstructed in the area of the Park Property Alternative, it won't necessarily be the full use for active recreation and tree planting, which is what is crucial to the community. (Spector_008)

We strongly urge DEP to site the Head End Facility at the primary study site alongside the Canal rather than within Thomas Greene Park. The key significant adverse environmental impact of the alternative site beneath Thomas Greene Park, the loss of active recreational park space, should not be taken lightly. As the DEIS rightly notes, the study area includes potential environmental justice areas, and the surrounding neighborhoods are sorely lacking in open space. We strongly urge DEP not to turn to this alternative site based on the significant adverse impact of loss of open space, as well as other considerations noted in the DEIS, including the increased cost and disruption during construction of building the tank at the alternative site due to the need to build additional conveyances below street level. (Group_016)

I hope that the park will not be taken because it is so needed by the surrounding community. (Wolfe_Friends_010, Aronowsky_Friends_011, Everett_013)

Response: Comments noted.

Comment 41: The CSO facility has a 50-foot tall head house. If you put that in one-third of Thomas Greene Park forget the light, the air in the rest of the park. (Wolfe_Friends_010)

Response: As discussed in Chapter 22 of the DEIS, "Alternatives," the above-grade structure of the facility under the Park Property Alternative would cast substantial shadows on the Thomas Greene Playground, particularly in the spring and summer, likely altering the character and usability of the space, particularly if the shaded area were to contain seating areas, wading or swimming pools or sprinklers, or planted areas. Consequently, unlike the Project, the Park Property Alternative would likely cause potential significant adverse shadow impacts to the park, which cannot be fully mitigated.

Comment 42: Of utmost concern is how DEP would mitigate for permanent alienation of park space if they fail to acquire the preferred location for the Head End Facility. (Aronowsky_Friends_011)

Should DEP be forced to build the storage tank at the alternative site within the park, mitigation must include a seamless transition to a temporary park and pool during constructing as well as permanent additional recreation space near the existing park to replace the lost use of the portion of the park where the head house will be located. In addition, mitigation should include upgrades to the rebuilt park in design, vegetation, shade, and recreational facilities. (Group_016)

Response: As discussed in Chapter 22 of the DEIS, "Alternatives," the permanent displacement of certain of the active recreation areas within Thomas Greene Playground for operation of a CSO facility under the Park Property Alternative, beyond the temporary displacement resulting from National Grid's remediation of the property, would result in a potential significant adverse impact to open space. If USEPA requires the City to build a CSO Facility at the Thomas Greene Playground, mitigation for this impact would be determined at that time, in consideration of the mitigation that will be independently implemented by National Grid and legislation that may be required for alienation of parkland.

Comment 43: Additionally, the DEIS alternatives analysis fails to compare the resiliency of the Head End siting alternative to climate change, flooding, and extreme weather. Both sites are within the 100-year flood plain of the Gowanus Canal, but on the privately-owned parcels, the Head End Facility would be sited directly next to the Canal and as such more vulnerable to flooding and extreme weather than the Park site, which is further inland. Construction of a facility with a substantial underground component directly next to a canal poses serious structural integrity concerns, particularly in extreme weather. (SPR_017)

Response: As described in Chapter 2 of the DEIS, "Land Use, Zoning, and Public Policy," the CSO Facilities would be located largely below grade (below the base flood elevation [BFE]), and would be designed with protection measures such as tide gates to prevent waters from the Canal from backing up into the Facilities. The Facilities would be designed in accordance with DEP's April 2017 Preliminary Climate Resiliency Design Guidelines for wastewater conveyance and treatment infrastructure, which requires that sensitive and critical equipment be located 40 inches above the 100-year BFE. As the Park Property Alternative would include construction of a facility within the 100-year floodplain similar to the Head End Facility, with similar protective measures in accordance with DEP's guidelines, there would be no improvement to resiliency with construction of the facility on the Park Property. Similarly, as noted above, the preferred location for the Head End Facility was determined through a focused site screening effort, which evaluated potential locations based on a variety of criteria, including engineering feasibility. DEP has also conducted extensive investigations to characterize the site to ensure that the excavation support and foundation design will account for site-specific conditions including the proximity to the Canal.

GENERAL COMMENTS IN SUPPORT OF THE PROJECT

Comment 44: We want to stress that the project as a whole will improve environmental conditions in the surrounding neighborhood. While a "no action alternative" was not considered here because the USEPA has ordered the installation of storage tanks to prevent CSO discharge into the Canal, we agree with USEPA that no action to curb sewage discharge into the Canal is unacceptable to the community. (Group_016, Spector_008)

Response: Comment noted. ✷

Appendix 2-1
Waterfront Revitalization Program
Form and Assessment

FOR INTERNAL USE ONLY
Date Received: ____________________

WRP No. ______________________
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 Coastal Zone, must be reviewed and assessed for their consistency with the *New York City Waterfront Revitalization Program* (*WRP*) which has been approved as part of the State's Coastal Management Program.

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, the New York City Department of City Planning, or other city or state agencies in their review of the applicant's certification of consistency.

A. APPLICANT INFORMATION

Name of Applicant: New York City Department of Environmental Protection (DEP)

Name of Applicant Representative: Vincent Sapienza, Acting Commissioner

Address: 95-06 Horace Harding Expressway, 5th Floor, Corona, NY 11368

Telephone: 718-595-4395 Email: vsapienza@dep.nyc.gov

Project site owner (if different than above): DSNY; project sites to be acquired are under private ownership

B. PROPOSED ACTIVITY

If more space is needed, include as an attachment.

1. Brief description of activity

The New York City Department of Environmental Protection (DEP) is constructing two Gowanus Canal Combined Sewer Overflow (CSO) Facilities that would intercept overflow of CSO solids entering the Gowanus Canal (the Canal). This work is part of the federally required remediation of the Canal under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). The Project is intended to address the requirements of an Administrative Settlement Agreement and Order (Settlement Agreement) issued by the United States Environmental Protection Agency (USEPA). One of the CSO facilities, the "Head End Facility," is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1) and would intercept overflow of CSO solids primarily from CSO outfall RH-034, located at the "head end," or northernmost portion of the Canal. The Head End Facility would include an 8 million gallon (MG) tank. The second facility, or the "Owls Head Facility," would be located at 2 2nd Avenue (Block 977, Lot 3), 110 Fifth Street (Block 990, Lot 21), 122 Fifth Street (Block 990, Lot 16), 22 2nd Avenue (Block 990, Lot 1), and 5th Street (Block 977, Lot 1), with portions of this area used as construction staging, and would intercept overflow of CSO solids primarily from CSO outfall OH-007, located at the middle of the Canal near the northern terminus of 2nd Avenue and the Fourth Street turning basin. The Owls Head Facility would include a 4 MG tank. Collectively, the Project includes the lease or acquisition of up to seven properties to support the facilities and construction staging areas.

2. Purpose of activity

The purpose and need of the Project is to conform to the USEPA ROD requirement to prevent recontamination of the Canal following the implementation of remedial actions. Upland sources of hazardous substances, including discharges from three former MGPs, CSOs, and other contaminated upland areas and unpermitted pipes along the Canal, must be addressed prior to the commencement of, or in phased coordination with, the implementation of the selected remedy. In accordance with the USEPA ROD, DEP will design and construct two CSO control facilities.

To support the construction of the Head End Facility, DEP must acquire two parcels located at 242 Nevins Street and 234 Butler Street to accommodate the Head End Facility, and lease or acquire one parcel located at 270 Nevins Street to use as a construction staging area.

To support the construction of the Owls Head Facility, DEP must acquire up to four parcels located at 110 Fifth Street, 122 Fifth Street, 22 2nd Avenue, and 5th Street adjacent to the Canal.

DEP is seeking ULURP approval for site selection and acquisition for both of the sites. For the Head End Facility, in addition to the ULURP approval for site selection and acquisition, DEP is pursuing ULURP approval for an amendment to the City Map involving the elimination of Douglass Street between the Canal and Nevins Street. This demapping is not necessary for the Project, but is a component of due diligence for the City of New York. Similarly, for the Owls Head Facility, the ULURP would include an amendment to the City Map involving the elimination of 5th Street between 2nd Avenue and the Canal.

C. PROJECT LOCATION

Borough: Brooklyn Tax Block/Lot(s): Multiple (see Attachment)

Street Address: Multiple (see Attachment)

Name of water body (if located on the waterfront): Gowanus Canal

D. REQUIRED ACTIONS OR APPROVALS

Check all that apply.

City Actions/Approvals/Funding

City Planning Commission ☑ Yes ☐ No

- ☑ City Map Amendment
- ☐ Zoning Map Amendment
- ☐ Zoning Text Amendment
- ☑ Site Selection – Public Facility
- ☐ Housing Plan & Project
- ☐ Special Permit
- ☐ Zoning Certification
- ☐ Zoning Authorizations
- ☑ Acquisition – Real Property
- ☐ Disposition – Real Property
- ☐ Other, explain: ______
- ☐ Concession
- ☐ UDAAP
- ☐ Revocable Consent
- ☐ Franchise

(if appropriate, specify type: ☐ Modification ☐ Renewal ☐ other) Expiration Date: ______

Board of Standards and Appeals ☐ Yes ☑ No

- ☐ Variance (use)
- ☐ Variance (bulk)
- ☐ Special Permit

(if appropriate, specify type: ☐ Modification ☐ Renewal ☐ other) Expiration Date: ______

Other City Approvals

- ☐ Legislation
- ☐ Rulemaking
- ☐ Construction of Public Facilities
- ☐ 384 (b) (4) Approval
- ☐ Other, explain: ______
- ☐ Funding for Construction, specify: ______
- ☐ Policy or Plan, specify: ______
- ☐ Funding of Program, specify: ______
- ☐ Permits, specify: ______

State Actions/Approvals/Funding

- ☑ State permit or license, specify Agency: Multiple Permit type and number: See Attachment
- ☐ Funding for Construction, specify: ______
- ☐ Funding of a Program, specify: ______
- ☐ Other, explain: ______

Federal Actions/Approvals/Funding

- ☑ Federal permit or license, specify Agency: Multiple Permit type and number: See Attachment
- ☐ Funding for Construction, specify: ______
- ☐ Funding of a Program, specify: ______
- ☐ Other, explain: ______

Is this being reviewed in conjunction with a Joint Application for Permits? ☑ Yes ☐ No

E. LOCATION QUESTIONS

1.	Does the project require a waterfront site?	☑ Yes	☐ No
2.	Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land under water or coastal waters?	☑ Yes	☐ No
3.	Is the project located on publicly owned land or receiving public assistance?	☑ Yes	☐ No
4.	Is the project located within a FEMA 1% annual chance floodplain? *(6.2)*	☑ Yes	☐ No
5.	Is the project located within a FEMA 0.2% annual chance floodplain? *(6.2)*	☑ Yes	☐ No
6.	Is the project located adjacent to or within a special area designation? *See Maps – Part III of the NYC WRP. If so, check appropriate boxes below and evaluate policies noted in parentheses as part of WRP Policy Assessment (Section F).*	☐ Yes	☑ No

- ☐ Significant Maritime and Industrial Area (SMIA) *(2.1)*
- ☐ Special Natural Waterfront Area (SNWA) *(4.1)*
- ☐ Priority Martine Activity Zone (PMAZ) *(3.5)*
- ☐ Recognized Ecological Complex (REC) *(4.4)*
- ☐ West Shore Ecologically Sensitive Maritime and Industrial Area (ESMIA) *(2.2, 4.2)*

F. WRP POLICY ASSESSMENT

Review the project or action for consistency with the WRP policies. For each policy, check Promote, Hinder *or* Not Applicable (N/A). *For more information about consistency review process and determination, see* ***Part I*** *of the NYC Waterfront Revitalization Program. When assessing each policy, review the full policy language, including all sub-policies, contained within* ***Part II*** *of the WRP. The relevance of each applicable policy may vary depending upon the project type and where it is located (i.e. if it is located within one of the special area designations).*

For those policies checked Promote or Hinder, *provide a written statement on a separate page that assesses the effects of the proposed activity on the relevant policies or standards. If the project or action promotes a policy, explain how the action would be consistent with the goals of the policy. If it hinders a policy, consideration should be given toward any practical means of altering or modifying the project to eliminate the hindrance. Policies that would be advanced by the project should be balanced against those that would be hindered by the project. If reasonable modifications to eliminate the hindrance are not possible, consideration should be given as to whether the hindrance is of such a degree as to be substantial, and if so, those adverse effects should be mitigated to the extent practicable.*

		Promote	Hinder	N/A
1	**Support and facilitate commercial and residential redevelopment in areas well-suited to such development.**	☐	☐	☑
1.1	Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.	☐	☐	☑
1.2	Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.	☐	☐	☑
1.3	Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.	☐	☐	☑
1.4	In areas adjacent to SMIAs, ensure new residential development maximizes compatibility with existing adjacent maritime and industrial uses.	☐	☐	☑
1.5	Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.	☐	☐	☑

		Promote	Hinder	N/A
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.	☐	☐	☑
2.2	Encourage a compatible relationship between working waterfront uses, upland development and natural resources within the Ecologically Sensitive Maritime and Industrial Area.	☐	☐	☑
2.3	Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas or Ecologically Sensitive Maritime Industrial Area.	☐	☐	☑
2.4	Provide infrastructure improvements necessary to support working waterfront uses.	☐	☐	☑
2.5	Incorporate consideration of climate change and sea level rise into the planning and design of waterfront industrial development and infrastructure, pursuant to WRP Policy 6.2.	☐	☐	☑
3	**Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.**	☐	☐	☑
3.1.	Support and encourage in-water recreational activities in suitable locations.	☐	☐	☑
3.2	Support and encourage recreational, educational and commercial boating in New York City's maritime centers.	☐	☐	☑
3.3	Minimize conflicts between recreational boating and commercial ship operations.	☐	☐	☑
3.4	Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.	☐	☐	☑
3.5	In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses.	☐	☐	☑
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.	☐	☐	☑
4.2	Protect and restore the ecological quality and component habitats and resources within the Ecologically Sensitive Maritime and Industrial Area.	☐	☐	☑
4.3	Protect designated Significant Coastal Fish and Wildlife Habitats.	☐	☐	☑
4.4	Identify, remediate and restore ecological functions within Recognized Ecological Complexes.	☐	☐	☑
4.5	Protect and restore tidal and freshwater wetlands.	☑	☐	☐
4.6	In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.	☐	☐	☑
4.7	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.	☑	☐	☐
4.8	Maintain and protect living aquatic resources.	☑	☐	☐

		Promote	Hinder	N/A
5	**Protect and improve water quality in the New York City coastal area.**	☑	☐	☐
5.1	Manage direct or indirect discharges to waterbodies.	☑	☐	☐
5.2	Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.	☑	☐	☐
5.3	Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.	☑	☐	☐
5.4	Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.	☑	☐	☐
5.5	Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.	☑	☐	☐
6	**Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.**	☑	☐	☐
6.1	Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.	☑	☐	☐
6.2	Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in *New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms*) into the planning and design of projects in the city's Coastal Zone.	☑	☐	☐
6.3	Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.	☐	☐	☑
6.4	Protect and preserve non-renewable sources of sand for beach nourishment.	☐	☐	☑
7	**Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.**	☑	☐	☐
7.1	Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.	☑	☐	☐
7.2	Prevent and remediate discharge of petroleum products.	☑	☐	☐
7.3	Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.	☑	☐	☐
8	**Provide public access to, from, and along New York City's coastal waters.**	☑	☐	☐
8.1	Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.	☑	☐	☐
8.2	Incorporate public access into new public and private development where compatible with proposed land use and coastal location.	☑	☐	☐
8.3	Provide visual access to the waterfront where physically practical.	☑	☐	☐
8.4	Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.	☑	☐	☐

		Promote	Hinder	N/A
8.5	Preserve the public interest in and use of lands and waters held in public trust by the State and City.	☑	☐	☐
8.6	Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.	☑	☐	☐
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 and working waterfront.	☑	☐	☐
9.2	Protect and enhance scenic values associated with natural resources.	☐	☐	☑
10	**Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.**	☑	☐	☐
10.1	Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.	☑	☐	☐
10.2	Protect and preserve archaeological resources and artifacts.	☑	☐	☐

G. CERTIFICATION

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

"The proposed activity complies with New York State's approved 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's Name: Mark N. Page, Jr., Managing Director

Address: 59-17 Junction Boulevard, Flushing, NY 11373

Telephone: 718-595-4395 Email: mpage@dep.nyc.gov

Applicant/Agent's Signature:

Date: 8/30/17

Submission Requirements

For all actions requiring City Planning Commission approval, materials should be submitted to the Department of City Planning.

For local actions not requiring City Planning Commission review, the applicant or agent shall submit materials to the Lead Agency responsible for environmental review. A copy should also be sent to the Department of City Planning.

For State actions or funding, the Lead Agency responsible for environmental review should transmit its WRP consistency assessment to the Department of City Planning.

For Federal direct actions, funding, or permits applications, including Joint Applicants for Permits, the applicant or agent shall also submit a copy of this completed form along with his/her application to the NYS Department of State Office of Planning and Development and other relevant state and federal agencies. A copy of the application should be provided to the NYC Department of City Planning.

The Department of City Planning is also available for consultation and advisement regarding WRP consistency procedural matters.

New York City Department of City Planning
Waterfront and Open Space Division
120 Broadway, 31st Floor
New York, New York 10271
212-720-3525
wrp@planning.nyc.gov
www.nyc.gov/wrp

New York State Department of State
Office of Planning and Development
Suite 1010
One Commerce Place, 99 Washington Avenue
Albany, New York 12231-0001
(518) 474-6000
www.dos.ny.gov/opd/programs/consistency

Applicant Checklist

- ☐ Copy of original signed NYC Consistency Assessment Form
- ☐ Attachment with consistency assessment statements for all relevant policies
- ☐ For Joint Applications for Permits, one (1) copy of the complete application package
- ☐ Environmental Review documents
- ☐ Drawings (plans, sections, elevations), surveys, photographs, maps, or other information or materials which would support the certification of consistency and are not included in other documents submitted. All drawings should be clearly labeled and at a scale that is legible.

WRP CONSISTENCY ASSESSMENT FORM—ADDITIONAL INFORMATION

C. Project Location

Tax Block/Lot	Address
Block 418, Lot 1	242 Nevins Street
Block 411, Lot 24	234 Butler Street
Block 425, Lot 1	270 Nevins Street
Block 977, Lot 3	2 2nd Avenue
Block 990, Lot 21	110 5th Street
Block 990, Lot 16	122 5th Street
Block 990, Lot 1	22 2nd Avenue
Block 977, Lot 1	5th Street

D. Required Actions or Approvals

Agency/Entity	Permit/Approval/Consultation/Coordination
FEDERAL	
U.S. Environmental Protection Agency (USEPA)	CERCLA coordination and consultation
Coastal Zone Management Act	Projects affecting New York's coastal zone must be consistent with the Coastal Zone Management Act, through the New York State Department of State's Coastal Management Program and approved Local Waterfront Revitalization Plans
U.S. Army Corps of Engineers (USACE)	Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act
United States Fish and Wildlife Service (USFWS)	Consultation under Section 7 of the Endangered Species Act; Biological Assessment; Federal Fish and Wildlife Permit
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act of 1966
STATE	
New York State Department of State (NYSDOS)	Coastal Zone Management Consistency
New York State Department of Environmental Conservation (DEC)	State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity - GP-0-10-001: erosion and sediment control and post-construction stormwater management in accordance with the stormwater pollution prevention plan (SWPPP)
	Individual SPDES Permit or Application Form NY-2C for Industrial Facilities (Dewatering activities requiring discharge to surface water)
	Modification to a SPDES Permit (Individual Permit) for Discharge of Wastewater from Publicly Owned Treatment Works (NY-2A) to remove inactive outfalls
	Tidal Wetlands Permit
	Long Island Well Permit and Approval of Completed Works
	Protection of Waters Permit Navigable Waters (Excavation or Fill)
	Section 401 Water Quality Certification
	Natural Heritage Program Consultation—consultation to determine potential presence of threatened or endangered species listed in New York State
New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP)	Consultation to determine potential presence of archaeological and/or historic resources and determine project's potential effects
NEW YORK CITY	
New York City Department of City Planning (DCP)	ULURP for site selection, property acquisition, and amendment to the City Map (street demapping for due diligence—not required to build the Project)
	New York City Waterfront Revitalization Program—Consistency Assessment

Note:
[1] Includes documentation of regulatory compliance under CERCLA through equivalent review by responsible agencies.

NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Workhsheet

COMPLETE INSTRUCTIONS ON HOW TO USE THIS WORKSHEET ARE PROVIDED IN THE "CLIMATE CHANGE ADAPTATION GUIDANCE" DOCUMENT AVAILABLE AT www.nyc.gov/wrp

Enter information about the project and site in highlighted cells in Tabs 1-3. HighTab 4 contains primary results. Tab 5, "Future Flood Level Projections" contains background computations. The remaining tabs contain additional results, to be used as relevant.Non-highlighted cells have been locked.

Background Information	
Project Name	Gowanus Canal CSO Facilities - Head End Site
Location	Gowanus Canal, Brooklyn, Kings County, New York
Type(s)	☐ Residential, Commercial, ☐ Parkland, Open Space, and ☐ Tidal Wetland Restoration ☐ Critical Infrastructure or ☐ Industrial Uses ☐ Over-water Structures ☑ Shoreline Structures ☐ Transportation ☑ Wastewater ☐ Coastal Protection
Description	Construction of two CSO facilities (Head End and Owls Head), including both below-grade and above-grade elements, to reduce the volume of combined sewer overflows entering the Canal. The Head End Site includes modification to the existing outfall RH-034 regulator structure. The Owls head site includes demolition and reconstruction of outfall OH-007 and construction of a replacement bulkhead along approximately 320 linear feet of shoreline from the mudline to MHW. The project would result in a 76% reduction of CSO volume discharged from outfall RH-034 and an 85% reduction of CSO volume discharged from outfall OH-007.
Planned Completion date	2028

For technical assistance on using this worksheet, email wrp@planning.nyc.gov, using the message subject "Policy 6.2 Worksheet Error."

Last update: June 7, 2017

Establish current tidal and flood heights.

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.28	**2.28**	**NAVD88**	*Datums for NOAA Battery Station 8518750*
1% flood height	10.00	**10.00**	**NAVD88**	*NYC Flood Hazard Mapper*
As relevant:				
0.2% flood height	14.80	14.80	**NAVD88**	
MHW	1.96	1.96	**NAVD88**	*Datums for NOAA Battery Station 8518750*
MSL	-0.20	-0.20	**NAVD88**	*Datums for NOAA Battery Station 8518750*
MLLW	-2.77	-2.77	**NAVD88**	*Datums for NOAA Battery Station 8518750*

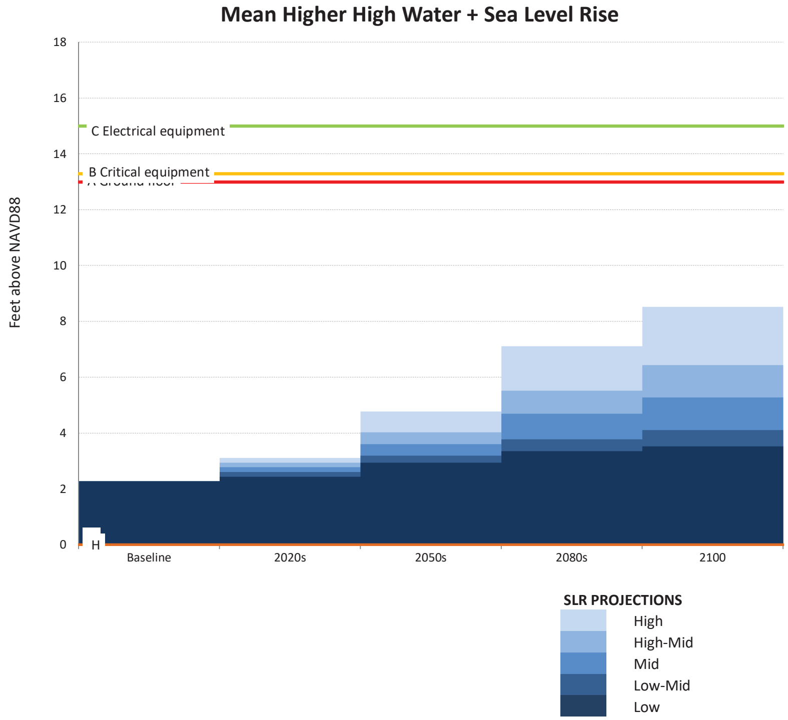
Data will be converted based on the following datums:

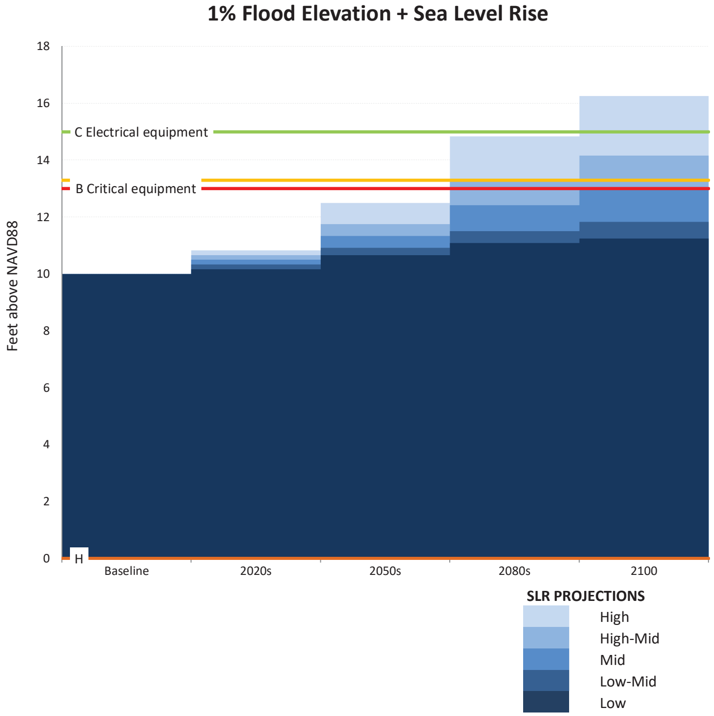
Datum	FT (NAVD88)
NAVD88	*0.00*
NGVD29	*-1.10*
Manhattan Datum	*1.65*
Bronx Datum	*1.51*
Brooklyn Datum (Sewer)	*0.61*
Brooklyn Datum (Highway)	*1.45*
Queens Datum	*1.63*
Richmond Datum	*2.09*
Station	
MLLW	

Describe key physical features of the project.

Feature *(enter name)*	Feature Category	Lifespan	Elevation	Units	Datum	Ft	Ft Above NAVD88	Ft Above MHHW	Ft Above 1% flood height	Ft Above 0.2% flood height
A Ground floor	☑ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other	100	13.0	Feet	NAVD88	13.0	13.0	10.7	3.0	-1.8
Description of Planned Uses and Materials: Head End Facility building - includes entrance to facility, critical equipment, and access to below-grade tanks and pumping systems										
B Critical equipment	☐ Vulnerable ☑ Critical ☐ Potentially Hazardous ☐ Other	50	13.3	Feet	NAVD88	13.3	13.3	11.0	3.3	-1.5
Description of Planned Uses and Materials: Mechanical equipment for pumping, settling, and treatment processes										
C Electrical equipment	☐ Vulnerable ☑ Critical ☐ Potentially Hazardous ☐ Other	50	15.0	Feet	NAVD88	15.0	15.0	12.7	5.0	0.2
Description of Planned Uses and Materials:Main power transformers and network protectors										
D	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials:										
E	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										
F	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										
G	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										
H	☐ Vulnerable ☐ Critical ☑ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										

Assess project vulnerability over a range of sea level rise projections.





SLR (ft)

	Low	Low-Mid	Mid	High-Mid	High	
Baseline	0.00	0.00	0.00	0.00	0.00	**2014**
2020s	0.17	0.33	0.50	0.67	0.83	**2020s**
2050s	0.67	0.92	1.33	1.75	2.50	**2050s**
2080s	1.08	1.50	2.42	3.25	4.83	**2080s**
2100	1.25	1.83	3.00	4.17	6.25	**2100**

MHHW+SLR (ft above NAVD88)

	Low	Low-Mid	Mid	High-Mid	High	
Baseline	2.28	2.28	2.28	2.28	2.28	**Baseline**
2020s	2.45	2.61	2.78	2.95	3.11	**2020s**
2050s	2.95	3.20	3.61	4.03	4.78	**2050s**
2080s	3.36	3.78	4.70	5.53	7.11	**2080s**
2100	3.53	4.11	5.28	6.45	8.53	**2100**

1%+SLR (ft above NAVD88)

	Low	Low-Mid	Mid	High-Mid	High	
Baseline	10.00	10.00	10.00	10.00	10.00	**Baseline**
2020s	10.17	10.33	10.50	10.67	10.83	**2020s**
2050s	10.67	10.92	11.33	11.75	12.50	**2050s**
2080s	11.08	11.50	12.42	13.25	14.83	**2080s**
2100	11.25	11.83	13.00	14.17	16.25	**2100**

0.2%+SLR (ft above NAVD88)

	Low	Low-Mid	Mid	High-Mid	High
Baseline	14.80	14.80	14.80	14.80	14.80
2020s	14.97	15.13	15.30	15.47	15.63
2050s	15.47	15.72	16.13	16.55	17.30
2080s	15.88	16.30	17.22	18.05	19.63
2100	16.05	16.63	17.80	18.97	21.05

	0	1
A Ground floor	13	13
B Critical equipment	13	13.3
C Electrical equipment	15	15
D	0	0
E	0	0
F	0	0
G	0	0
H	0	0

SLR (in)

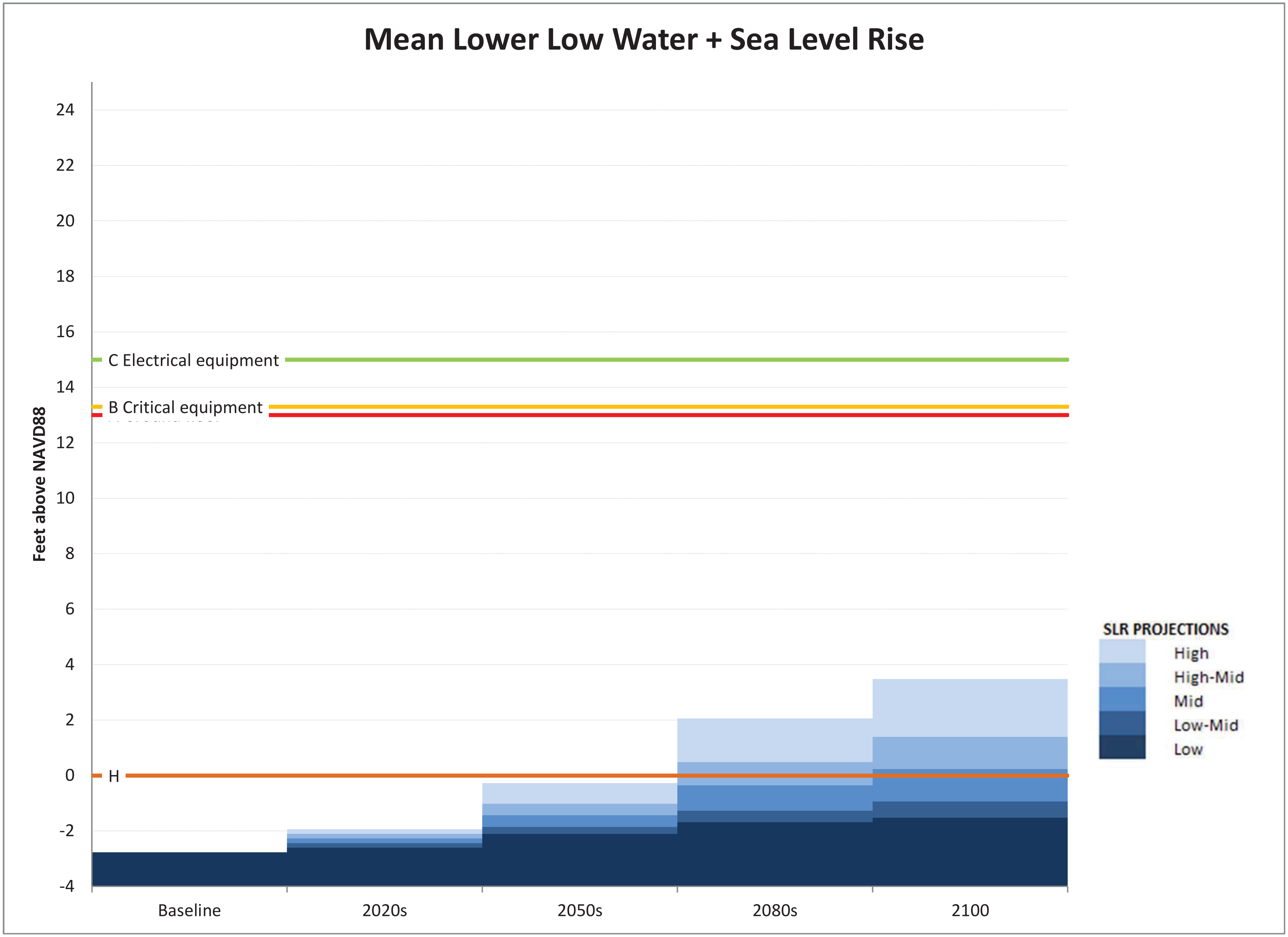
Low	Low-Mid	Mid	High-Mid	High
0	0	0	0	0
2	4	6	8	10
8	11	16	21	30
13	18	29	39	58
15	22	36	50	75

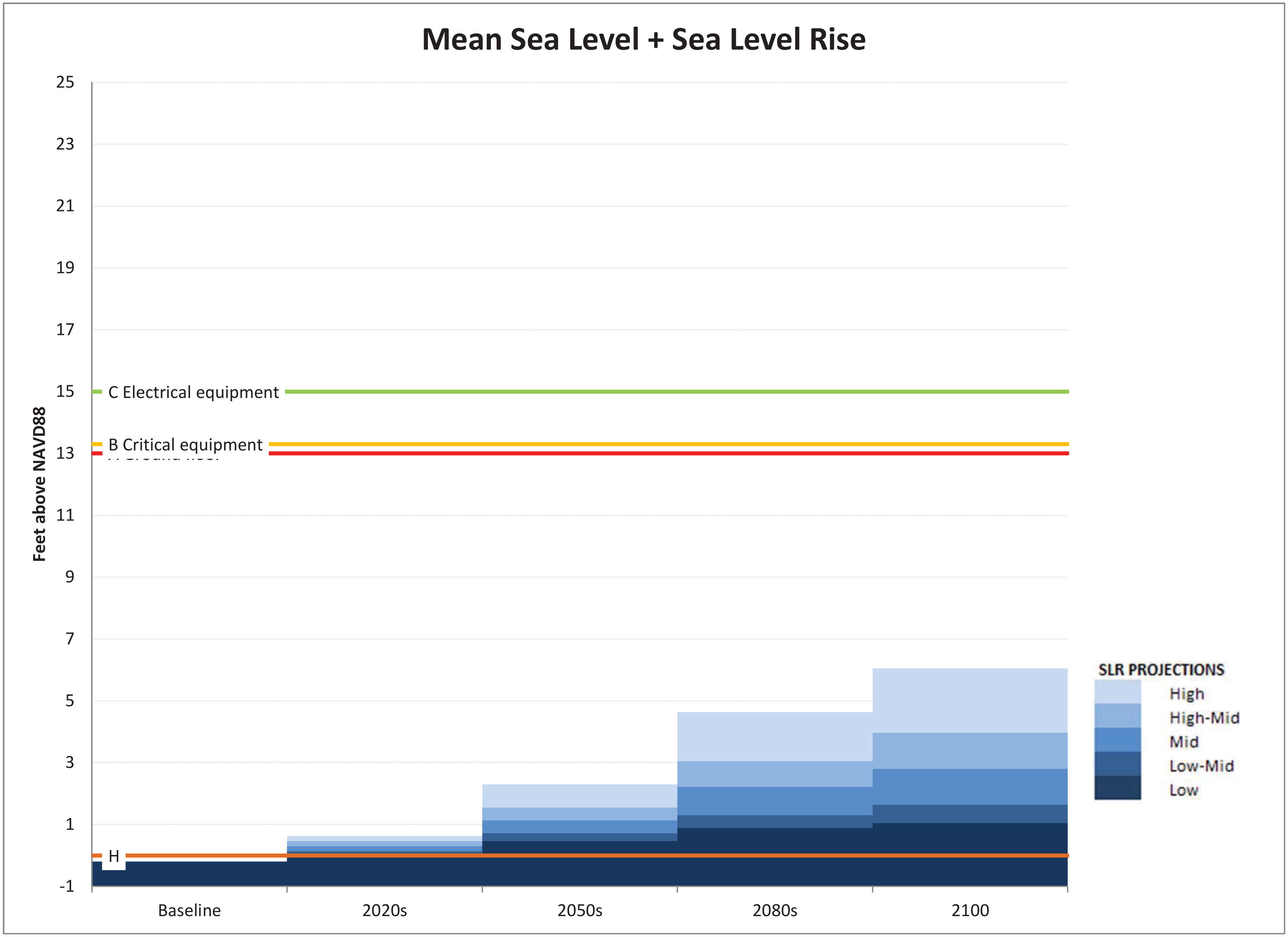
MLLW+SLR (ft above NAVD88)

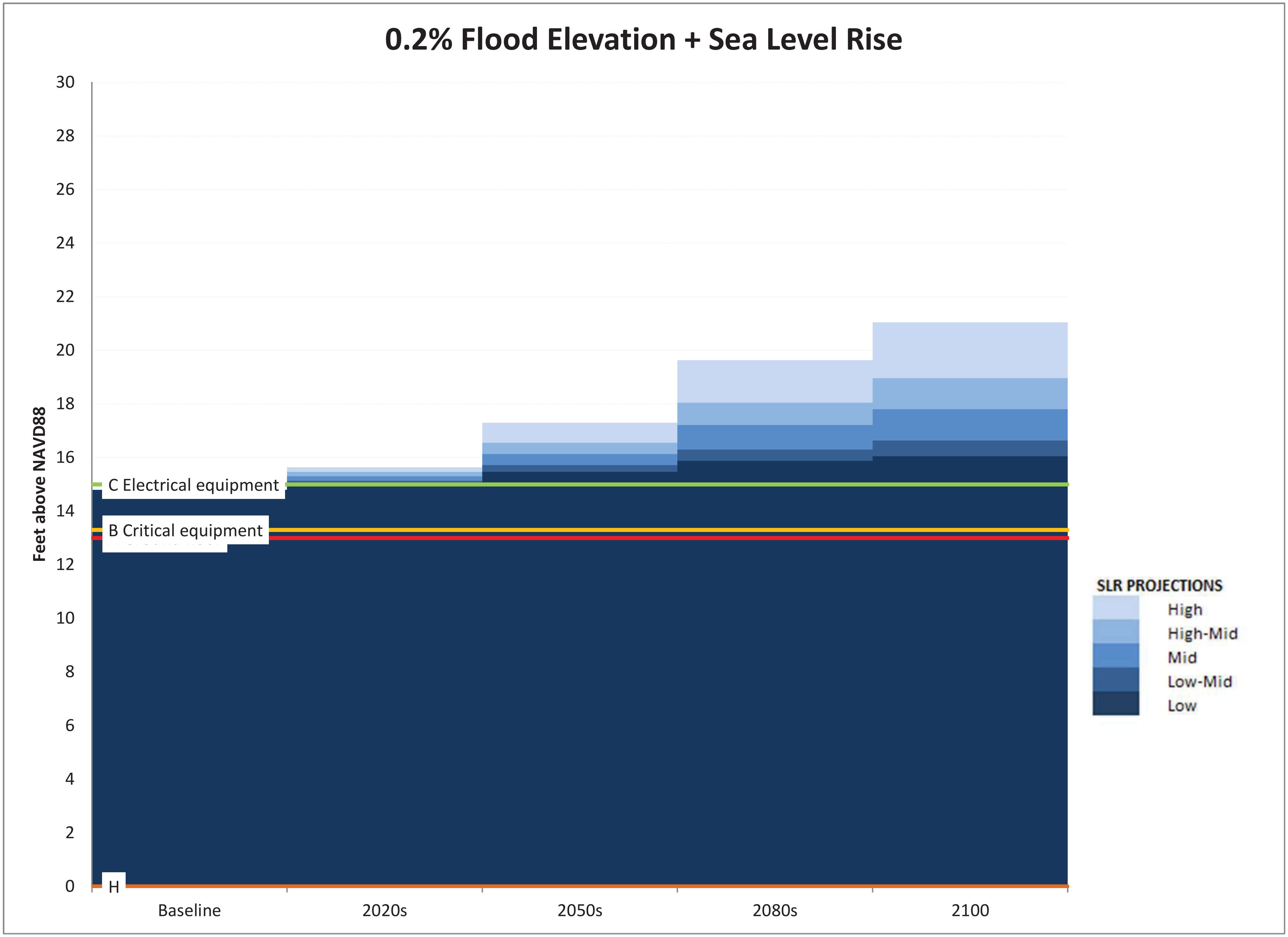
Low	Low-Mid	Mid	High-Mid	High
-2.77	-2.77	-2.77	-2.77	-2.77
-2.60	-2.44	-2.27	-2.10	-1.94
-2.10	-1.85	-1.44	-1.02	-0.27
-1.69	-1.27	-0.35	0.48	2.06
-1.52	-0.94	0.23	1.40	3.48

MSL+SLR (ft above NAVD88)

Low	Low-Mid	Mid	High-Mid	High
-0.20	-0.20	-0.20	-0.20	-0.20
-0.03	0.13	0.30	0.47	0.63
0.47	0.72	1.13	1.55	2.30
0.88	1.30	2.22	3.05	4.63
1.05	1.63	2.80	3.97	6.05


Mean Lower Low Water + Sea Level Rise
Feet above NAVD88
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
C Electrical equipment
B Critical equipment
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low


Mean Sea Level + Sea Level Rise
Feet above NAVD88
25
23
21
19
17
15
13
11
9
7
5
3
1
-1
C Electrical equipment
B Critical equipment
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low



0.2% Flood Elevation + Sea Level Rise
Feet above NAVD88
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
C Electrical equipment
B Critical equipment
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low

NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Workhsheet

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Enter information about the project and site in highlighted cells in Tabs 1-3. HighTab 4 contains primary results. Tab 5, "Future Flood Level Projections" contains background computations. The remaining tabs contain additional results, to be used as relevant.Non-highlighted cells have been locked.

Background Information	
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Location	Gowanus Canal, Brooklyn, Kings County, New York
Type(s)	☐ Residential, Commercial, ☐ Parkland, Open Space, and ☐ Tidal Wetland Restoration ☐ Critical Infrastructure or ☐ Industrial Uses ☐ Over-water Structures ☑ Shoreline Structures ☐ Transportation ☑ Wastewater ☐ Coastal Protection
Description	Construction of two CSO facilities (Head End and Owls Head), including both below-grade and above-grade elements, to reduce the volume of combined sewer overflows entering the Canal. The Head End Site includes modification to the existing outfall RH-034 regulator structure. The Owls head site includes demolition and reconstruction of outfall OH-007 and construction of a replacement bulkhead along approximately 320 linear feet of shoreline from the mudline to MHW. The project would result in a 76% reduction of CSO volume discharged from outfall RH-034 and an 85% reduction of CSO volume discharged from outfall OH-007.
Planned Completion date	2028

For technical assistance on using this worksheet, email wrp@planning.nyc.gov, using the message subject "Policy 6.2 Worksheet Error."

Last update: June 7, 2017

Establish current tidal and flood heights.

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.28	**2.28**	**NAVD88**	*Datums for NOAA Battery Station 8518750*
1% flood height	11.00	**11.00**	**NAVD88**	*NYC Flood Hazard Mapper*
As relevant:				
0.2% flood height	14.80	14.80	**NAVD88**	
MHW	1.96	1.96	**NAVD88**	*Datums for NOAA Battery Station 8518750*
MSL	-0.20	-0.20	**NAVD88**	*Datums for NOAA Battery Station 8518750*
MLLW	-2.77	-2.77	**NAVD88**	*Datums for NOAA Battery Station 8518750*

Data will be converted based on the following datums:

Datum	FT (NAVD88)
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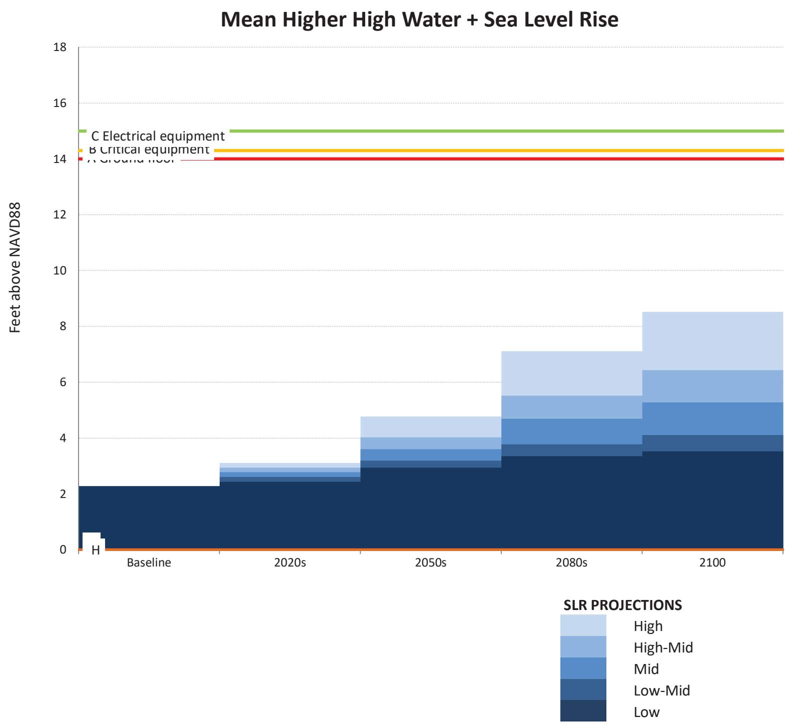
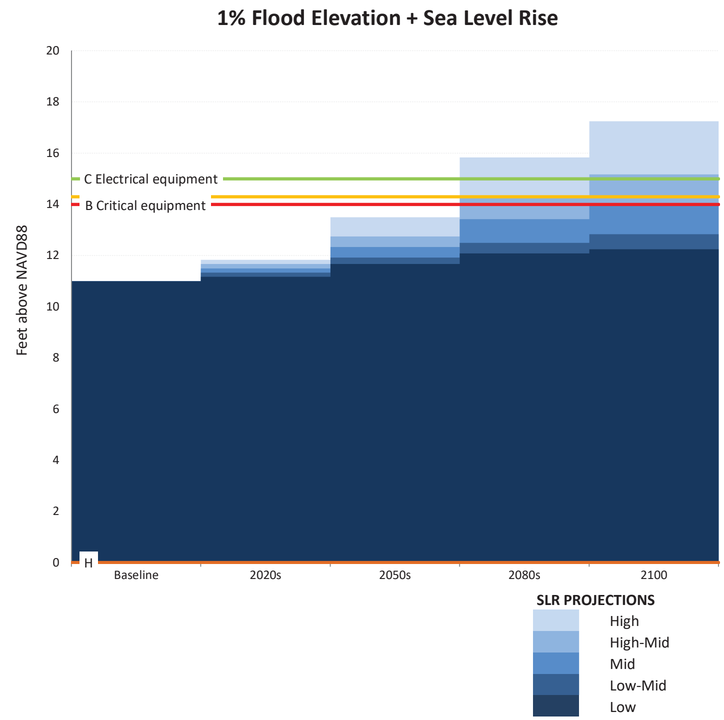
NGVD29	*-1.10*
Manhattan Datum	*1.65*
Bronx Datum	*1.51*
Brooklyn Datum (Sewer)	*0.61*
Brooklyn Datum (Highway)	*1.45*
Queens Datum	*1.63*
Richmond Datum	*2.09*
Station	
MLLW	

Describe key physical features of the project.

Feature *(enter name)*	Feature Category	Lifespan	Elevation	Units	Datum	Ft	Ft Above NAVD88	Ft Above MHHW	Ft Above 1% flood height	Ft Above 0.2% flood height
A Ground floor	☑ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other	100	14.0	Feet	NAVD88	14.0	14.0	11.7	3.0	-0.8
Description of Planned Uses and Materials: Owls Head Facility building - includes entrance to facility, critical equipment, and access to below-grade tanks and pumping systems										
B Critical equipment	☐ Vulnerable ☑ Critical ☐ Potentially Hazardous ☐ Other	50	14.3	Feet	NAVD88	14.3	14.3	12.0	3.3	-0.5
Description of Planned Uses and Materials: Mechanical equipment for pumping, settling, and treatment processes										
C Electrical equipment	☐ Vulnerable ☑ Critical ☐ Potentially Hazardous ☐ Other	50	15.0	Feet	NAVD88	15.0	15.0	12.7	4.0	0.2
Description of Planned Uses and Materials:Main power transformers and network protectors										
D	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials:										
E	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										
F	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										
G	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										
H	☐ Vulnerable ☐ Critical ☑ Potentially Hazardous ☐ Other			Feet	NAVD88					
Description of Planned Uses and Materials										

Assess project vulnerability over a range of sea level rise projections.





SLR (ft)	Low	Low-Mid	Mid	High-Mid	High	
Baseline	0.00	0.00	0.00	0.00	0.00	**2014**
2020s	0.17	0.33	0.50	0.67	0.83	**2020s**
2050s	0.67	0.92	1.33	1.75	2.50	**2050s**
2080s	1.08	1.50	2.42	3.25	4.83	**2080s**
2100	1.25	1.83	3.00	4.17	6.25	**2100**

MHHW+SLR (ft above NAVD88)	Low	Low-Mid	Mid	High-Mid	High	
Baseline	2.28	2.28	2.28	2.28	2.28	**Baseline**
2020s	2.45	2.61	2.78	2.95	3.11	**2020s**
2050s	2.95	3.20	3.61	4.03	4.78	**2050s**
2080s	3.36	3.78	4.70	5.53	7.11	**2080s**
2100	3.53	4.11	5.28	6.45	8.53	**2100**

1%+SLR (ft above NAVD88)	Low	Low-Mid	Mid	High-Mid	High	
Baseline	11.00	11.00	11.00	11.00	11.00	**Baseline**
2020s	11.17	11.33	11.50	11.67	11.83	**2020s**
2050s	11.67	11.92	12.33	12.75	13.50	**2050s**
2080s	12.08	12.50	13.42	14.25	15.83	**2080s**
2100	12.25	12.83	14.00	15.17	17.25	**2100**

0.2%+SLR (ft above NAVD88)	Low	Low-Mid	Mid	High-Mid	High
Baseline	14.80	14.80	14.80	14.80	14.80
2020s	14.97	15.13	15.30	15.47	15.63
2050s	15.47	15.72	16.13	16.55	17.30
2080s	15.88	16.30	17.22	18.05	19.63
2100	16.05	16.63	17.80	18.97	21.05

	0	1
A Ground floor	14	14
B Critical equipment	14	14.3
C Electrical equipment	15	15
D	0	0
E	0	0
F	0	0
G	0	0
H	0	0

SLR (in)

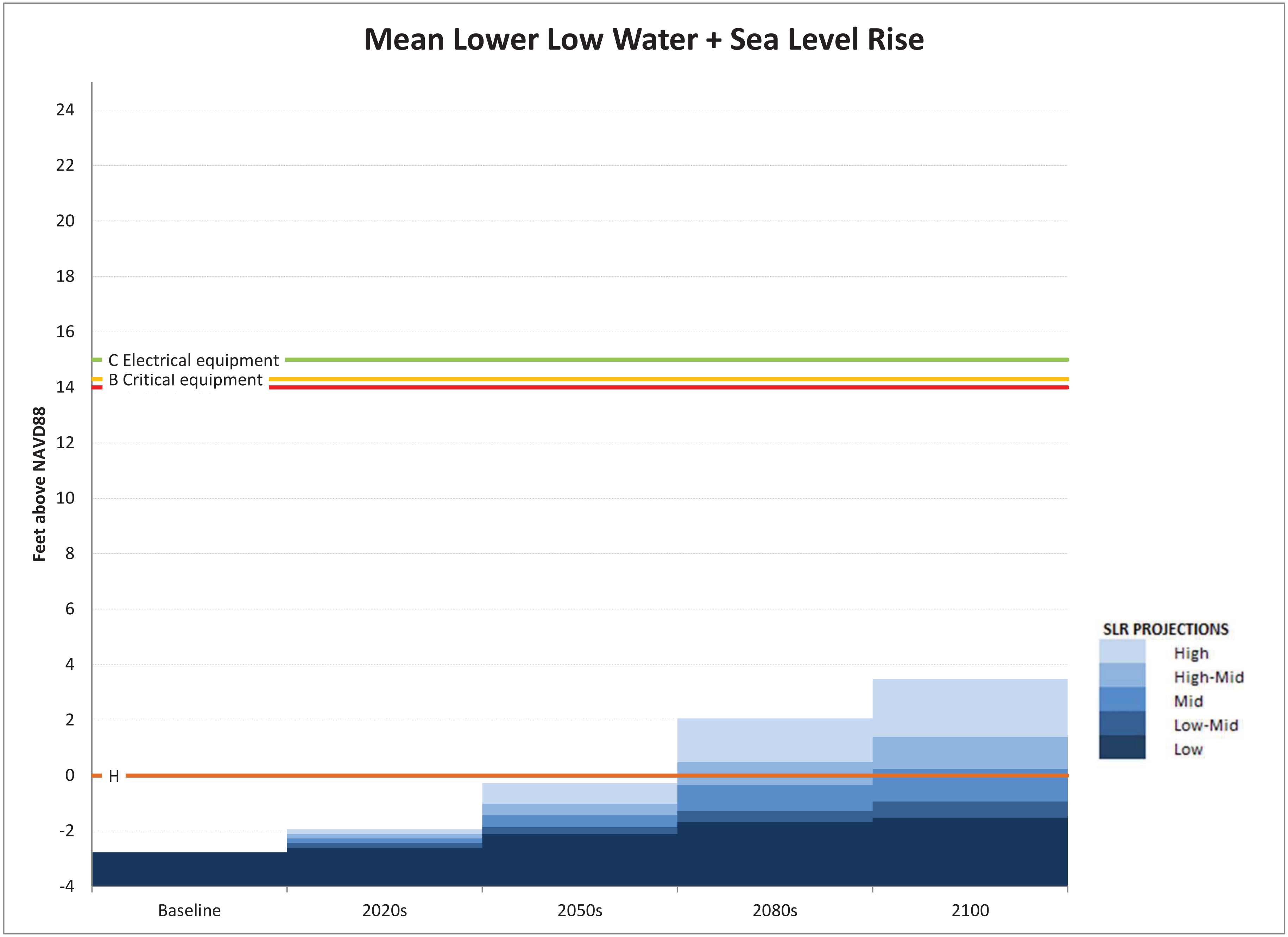
Low	Low-Mid	Mid	High-Mid	High
0	0	0	0	0
2	4	6	8	10
8	11	16	21	30
13	18	29	39	58
15	22	36	50	75

MLLW+SLR (ft above NAVD88)

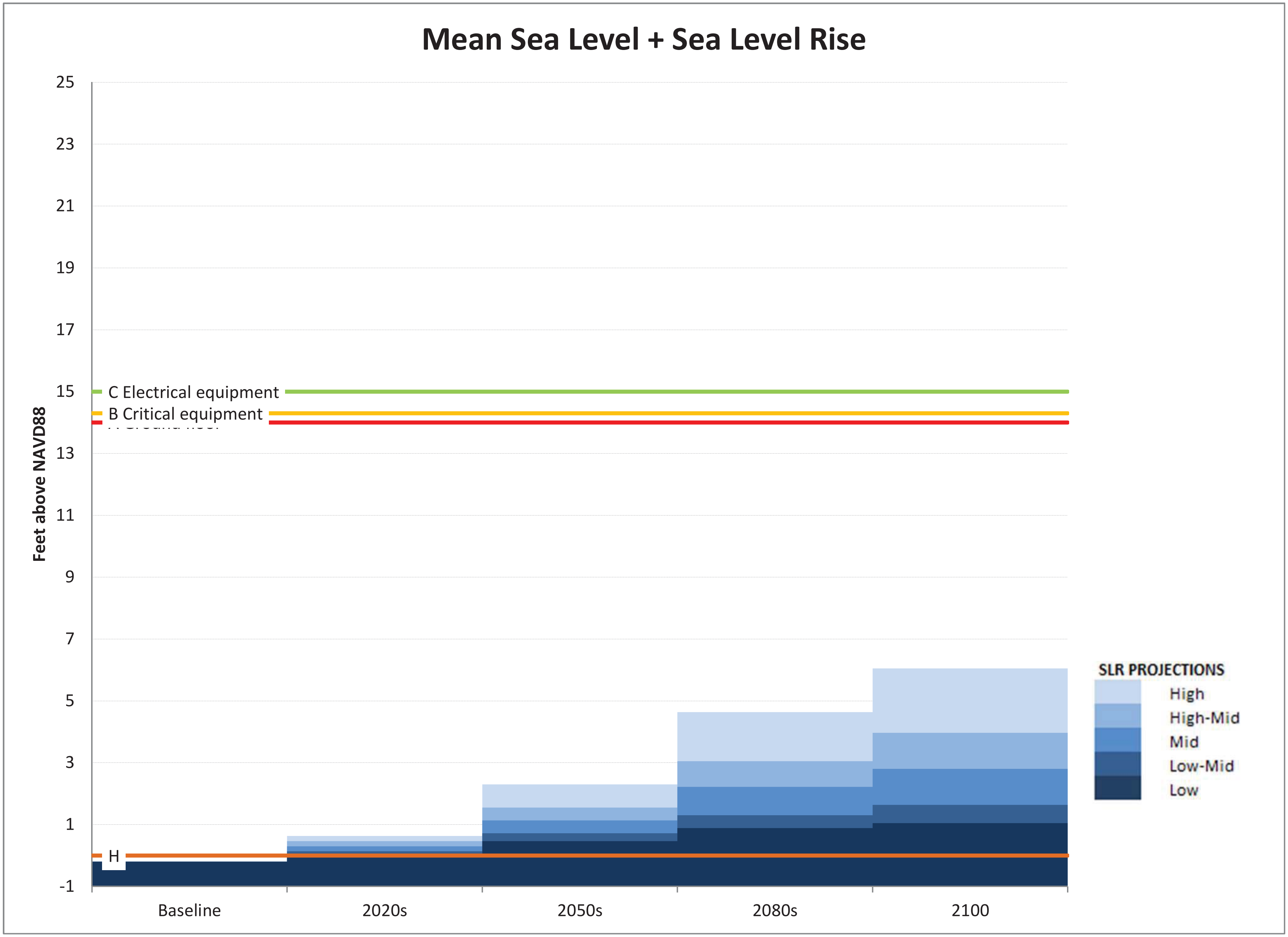
Low	Low-Mid	Mid	High-Mid	High
-2.77	-2.77	-2.77	-2.77	-2.77
-2.60	-2.44	-2.27	-2.10	-1.94
-2.10	-1.85	-1.44	-1.02	-0.27
-1.69	-1.27	-0.35	0.48	2.06
-1.52	-0.94	0.23	1.40	3.48

MSL+SLR (ft above NAVD88)

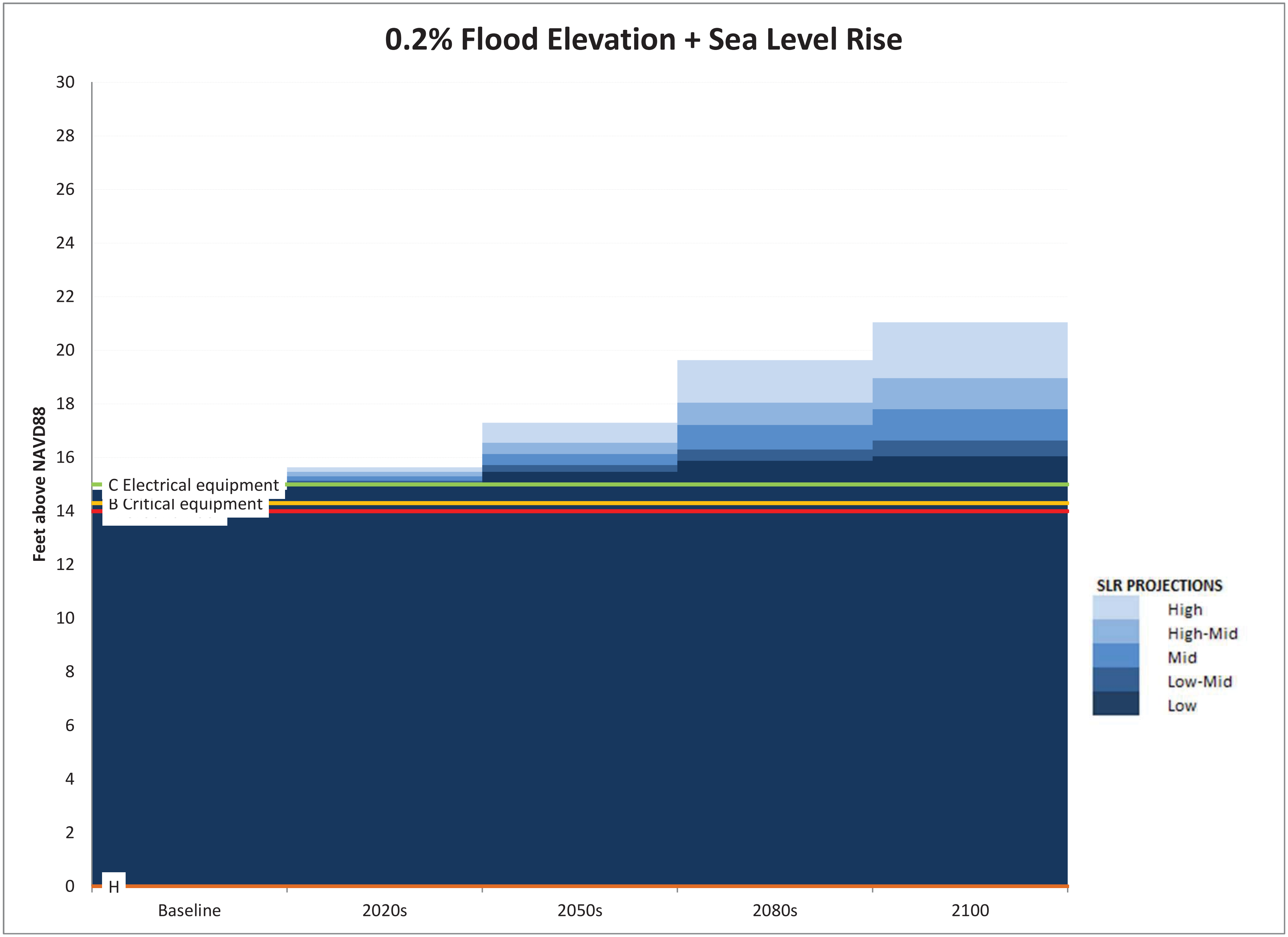
Low	Low-Mid	Mid	High-Mid	High
-0.20	-0.20	-0.20	-0.20	-0.20
-0.03	0.13	0.30	0.47	0.63
0.47	0.72	1.13	1.55	2.30
0.88	1.30	2.22	3.05	4.63
1.05	1.63	2.80	3.97	6.05



Mean Lower Low Water + Sea Level Rise
Feet above NAVD88
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
C Electrical equipment
B Critical equipment
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low



Mean Sea Level + Sea Level Rise
Feet above NAVD88
25
23
21
19
17
15
13
11
9
7
5
3
1
-1
C Electrical equipment
B Critical equipment
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low



0.2% Flood Elevation + Sea Level Rise
Feet above NAVD88
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
C Electrical equipment
B Critical equipment
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low

Appendix 2-2
Fair Share Analysis

Gowanus Canal CSO Facilities
Fair Share Analysis—Head End Facility

A. INTRODUCTION

This Fair Share analysis was prepared for the combined sewer overflow (CSO) control facility to be constructed by the New York City Department of Environmental Protection (DEP) at 242 Nevins Street and 234 Butler Street in Brooklyn near the head of the Gowanus Canal (the "Head End Facility") (see **Figure 1**). The Head End Facility is one of the CSO facilities that are to be designed and constructed as part of the federally required remediation of the Gowanus Canal (the "Canal") under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund); collectively, the CSO facilities are known as the Gowanus Canal CSO Facilities Project.[1] This Fair Share analysis applies the *Criteria for the Location of City Facilities* (the "Fair Share Criteria" or "Criteria") as set forth in Appendix A to Title 62 of the Rules of the City of New York (RCNY).

The Fair Share Criteria are applied whenever the City sites a new facility; expands a facility "significantly," *i.e.*, a physical enlargement of 25 percent and 500 square feet or more; reduces the size of a facility "significantly," *i.e.*, by 25 percent or more; substantially changes the use of an existing facility; relocates a facility; or closes a facility that is not replaced at another location. This analysis evaluates the Head End Facility as the siting of a new facility. Specifically, as discussed further below, this analysis address Article 4 and Article 6 (Sections 6.1 through 6.4) of the Criteria, which are the sections relevant to the siting or expansion of a regional waste management facility.

B. BACKGROUND

On March 2, 2010, the Canal was designated a federal Superfund site under CERCLA and placed on the CERCLA National Priorities List (NPL). On September 27, 2013, the U.S. Environmental Protection Agency (USEPA) issued a Record of Decision (ROD) identifying actions to be undertaken by various parties to remediate contamination in the Canal. As part of the ROD, USEPA mandated the construction of the Gowanus Canal CSO Facilities to reduce the volume of CSOs entering the Canal. The Head End Facility would reduce CSOs from the portion of the Canal's sewershed that is within the service area of the Red Hook Wastewater Treatment Plant (RH WWTP), which is generally located to the north and west of the Canal; the service area also extends on the east side of the Canal down to Carroll Street. During certain wet weather events, up to seven CSO outfalls discharge to the Canal from the RH area. Outfall RH-034 (located adjacent to the Gowanus Wastewater Pumping Station at the head of the Canal) discharges the greatest amount of CSO, as measured by activation frequency and overflow volume.

The Head End Facility includes an 8-million-gallon (MG) tank that would intercept CSO discharges from the RH area, primarily from CSO outfall RH-034. The Head End Facility is proposed to be located at 242 Nevins Street (Block 418, Lot 1) and 234 Butler Street (Block 411, Lot 24), with an area for construction staging located at 270 Nevins Street (Block 425, Lot 1).

The Head End Facility was the subject of a DEP siting and planning study, which evaluated a range of tank sizes and alternatives and assessed their performance against the ROD goal of 58 to 74 percent solids load reduction. DEP submitted a Site Recommendation Report for the Head End Facility to USEPA in June 2015, which recommended the location comprised of the two privately owned parcels located at 242

[1] A second CSO facility to be constructed at the middle of the Canal near the northern terminus of 2nd Avenue and the 4th Street turning basin in Brooklyn (the "Owls Head Facility") will be subject to separate approvals by the City Planning Commission (CPC) and will be undergoing separate review under the Uniform Land Use Review Procedure (ULURP), and is therefore not considered in this analysis.

Nevins Street and 234 Butler Street. This recommendation also included use of the privately owned parcel at 270 Nevins Street for construction staging. As discussed further below, the siting and planning study considered an alternate location for the Head End Facility at the City-owned Thomas Greene Playground (the "Park Property"), but did not select this location as the recommended location.

On June 9, 2016, USEPA issued a memorandum to file stating that the size of the storage tanks at the Head End Facility should be 8 MG. Also on June 9, 2016, USEPA issued an Administrative Settlement Agreement and Order for Remedial Design, Removal Action, and Cost Recovery (the "Settlement Agreement") directing DEP to construct the Head End Facility at the recommended location. However, under the Settlement Agreement, under certain specified circumstances, USEPA retains the discretion to direct the City to construct the Head End Facility at the Park Property alternate site.

As currently proposed, the Head End Facility would consist of a below-grade structure containing the 8-MG tank and tank system, and an approximately 25,700-sf, two-story above-grade structure housing the screening equipment, electrical equipment, odor control system, emergency generator, and crew areas. The above-grade structure is expected to be located at the northern end of the site, with the remainder of the surface area on the site expected to be paved and accessible for maintenance and operations with landscaping where appropriate. The design would include a 50-foot setback from the bulkhead wall, and may provide some form of public waterfront access. The surface layout of the Head End Site is currently being designed; additional public access areas and/or public amenities provided on the site will be determined through additional facility design in consultation with the local community and other City agencies.

During wet weather events, flow will be conveyed to the Head End Facility by gravity, collected and retained in the storage tank, then pumped to the Gowanus Wastewater Pumping Station for delivery to the Red Hook WWTP once there is sufficient downstream capacity in the sewer system. As the tank is emptied, accumulated solids will be flushed out. The Head End Facility will reduce the CSO volume discharged from outfall RH-034 during a typical year by approximately 76 percent, from 137 MG to 33 MG.

C. APPLICATION OF FAIR SHARE CRITERIA

This analysis has been prepared to evaluate the Head End Facility as a new facility. Following the guidance of the Fair Share Criteria, the analysis addresses Article 4 and Article 6 (Sections 6.1 through 6.4) of the Criteria, as these are the sections relevant to the siting or expansion of a regional waste management facility.

ARTICLE 4: CRITERIA FOR SITING OR EXPANDING FACILITIES

4.1: The sponsoring agency and, for actions subject to the Uniform Land Use Review Procedure (ULURP) or review pursuant to Section 195 of the Charter, the City Planning Commission shall consider the following criteria:

4.1(a) Compatibility of the facility with existing facilities and programs, both city and non-city, in the immediate vicinity of the site.

A study area within a 600-foot radius of the project site was analyzed to determine the presence and location of existing City and non-City facilities and services. The surrounding area primarily contains commercial, light-industrial, and residential uses—an increasingly common mix around the Canal and in the surrounding area. In particular, the properties fronting the Canal to the south of the project site and on the western side of the Canal consist mainly of one- to three-story distribution and warehouse buildings, as well as open storage yards, truck/bus parking lots, and artist workspaces and studios. North of the Head End Site along Baltic and Butler Streets and east of the Head End Site between Nevins Street and 3rd Avenue, a mix of legal non-conforming residential buildings are interspersed with vacant former manufacturing buildings, distribution/warehousing buildings and commercial space.

Residential uses within the study area are generally located to the north of the project site along Warren Street, and to the west of the project site along Bond Street: these portions of the study area are closer to the primarily residential Carroll Gardens and Boerum Hill neighborhoods, and contain one- and two-family townhouses and walkup apartment buildings. Similar residential buildings are located near the intersection of Bond and Butler Streets west of the project site and near Union and Nevins Streets south of the project site, including a four-story former warehouse building (282 Nevins Street) that has been converted to a multi-family apartment building and artists lofts under provisions of the New York City Loft Law. In addition, there are two New York City Housing Authority (NYCHA) residential complexes within the study area: Wyckoff Gardens is located north of the project site on Nevins Street, and the Gowanus Houses are located west of the project site along Bond Street. The commercial uses in the area are predominantly local retail facilities, hotels, and entertainment and fitness facilities located adjacent to the residential buildings along Bond Street and near Union and Nevins Streets and along Baltic and Butler Streets.

The project site is located within a manufacturing zoning district (M2-1), which extends along both sides of the Canal south of Butler Street. Under zoning, the Head End Facility is considered to be a manufacturing use (Use Group 18) that is permitted in the M2-1 district by conforming to the applicable performance standards.

There are several City- and non-City facilities within the 600-foot study area (shown on **Table 1** and **Figure 2**). One facility, the DEP Gowanus Wastewater Pumping Station, is located immediately to the west of the project site along Butler Street. The Gowanus Wastewater Pumping Station is part of the combined sewer system serving the Red Hook WWTP, and primarily receives flows from three major sewers serving neighborhoods north of the Canal. The capacity of the pumping station is 30 million gallons per day (mgd). All dry weather and wet weather flow up to 30 mgd is discharged from the pumping station directly via an existing force main to the interceptor sewer that connects to the Red Hook WWTP (located along Columbia Street). The pumping station was recently upgraded by DEP as part of the Gowanus Canal Waterbody/Watershed Facility Plan (WWFP). Another City facility is the Thomas Greene Playground, a public open space (which includes a public pool) operated by the New York City Department of Parks and Recreation (NYC Parks), located east of the project site between Douglass and DeGraw Streets. The remaining facilities are two senior centers located within the nearby NYCHA complexes (the Wyckoff Gardens Neighborhood Senior Center on the Wyckoff Gardens campus and the RAICES Gowanus Senior Center on the Gowanus Houses campus), and a privately owned solid waste carting business.[1]

An assessment of the Head End Facility's consistency with land use, zoning, and public policy is provided in the *Gowanus Canal CSO Facilities DEIS.* The facility would be part of the extensive sewer infrastructure system present in the area around the Canal—in particular the DEP Gowanus Wastewater Pumping Station—and would be compatible with the warehouse and shipping facilities in the surrounding area. Operation of the Head End Facility would not have an effect on the adjacent Thomas Greene Playground, and the facility's design may provide some form of waterfront public

[1] The private solid waste carting businesses identified in the 600-foot study area and the ½-mile study area (under Criterion 4.1[b] below) are smaller waste handling facilities that are used as storage and staging areas for private waste collection services, including truck storage. The facilities are not large municipal waste management facilities, e.g. solid waste transfer or disposal facilities. Although these facilities are part of the City's solid waste management network, they feature lower levels of disturbance (e.g., air pollution emissions, traffic, noise) than transfer facilities and are similar to light manufacturing or shipping facilities.

access along the Canal as compared with the manufacturing and auto-related uses that currently block access to the Canal. As noted above, the Head End Facility is a permitted use in the M2-1 district conforming to the applicable performance standards. Therefore, the Head End Facility would not conflict with existing facilities or uses in the immediate surrounding area.

4.1(b) Extent to which neighborhood character would be adversely affected by a concentration of city and/or non-city facilities.

The purpose of this criterion is to assess whether the project site is located in an area where facilities are already concentrated, whether the proposed facility would contribute to such a concentration, and if so, whether such a concentration would have an adverse effect on the surrounding neighborhood. The study area for the assessment extends a ½ mile around the project site.

The area to the south of the Head End Facility within ½ mile of the project site extends along the Canal, and contains primarily manufacturing and shipping facilities similar to the area near the head of the Canal (described above). In addition, the area within ½ mile of the project site extends to the low-density residential neighborhoods located to the west (Carroll Gardens), north (Boerum Hill), and east (Park Slope). These areas primarily contain single-family homes and small apartment buildings, along with local retail facilities. The area contains a number of community facilities, in particular schools and public parks.

An inventory of City and non-City facilities was undertaken within this ½-mile study area and is summarized in **Table 1**. The facilities are primarily neighborhood facilities that predominantly serve the local community, such as schools, parks and playgrounds, and child care centers, that do not contribute to an adverse concentration of facilities. The non-neighborhood facilities in the area (facilities that serve a more regional community) include the Gowanus Wastewater Pumping Station and several private solid waste carting businesses, which are generally in the area around the Canal. This area near the Canal is characterized by manufacturing and shipping uses; the residential neighborhoods are located further away from the Canal to the east, north, and west. Therefore, the presence of these non-neighborhood facilities near the Canal does not represent an incompatible land use or an adverse concentration of non-neighborhood facilities.

As discussed above, the Head End Facility would not conflict with the existing facilities or uses in its immediate surrounding area. As discussed in greater detail below under Criteria 4.1(c), in order to meet the USEPA mandate under the ROD, the location of the Head End Facility was determined by a siting and planning study completed in 2015. The site of the Head End Facility is the recommended location due to its proximity to the existing sewer infrastructure in the area, in particular outfall RH-034 and the Gowanus Wastewater Pumping Station, and its engineering and construction benefits.

Based on the information presented above, the Head End Facility would be similar to other existing infrastructure facilities in the area, and would not contribute to an adverse concentration of City and/or non-City facilities.

Table 1
City and Non-City Facilities Within ½-Mile of the Project Site

Map ID No.[1]	Block	Lot	Location/Address	Facility Name/Use	Facility Type	Agency/ Owner
1	171	26	250 Schermerhorn Street	NY State Department of Labor	Government Office	NYSDOL
2	172	18	274 Schermerhorn Street	PS 369 Playground	Park/Playground	DCAS/DOE
3	172	48	409 State Street	FDNY Engine 226	Fire Station	FDNY
4	172	55	383 State Street	PS 369	School	DCAS/DOE
5	173	1	45 Nevins Street	Traffic Enforcement Division	Government Office	NYPD
6	173	5	358 Schermerhorn Street	Sixteen Sycamores Playground	Park/Playground	NYC Parks
7	174	1	362 Schermerhorn Street	K592 Khalil Gibran International Academy	School	DCAS/DOE
8	174	18	98 Flatbush Ave	Beth Israel Medical Center Cumberland	Hospital/Medical Facility	Private
9	175	1	275 Atlantic Avenue	Brooklyn House of Detention	Detention Center	NYCDOC
10	180	7502	557 Atlantic Avenue	MSKCC Brooklyn Infusion Center	Hospital/Medical Facility	Private
11	182	48	299 Pacific Street	The Sterling School	School	Private
12	184	25	460 Atlantic Avenue	RAICES Times Plaza Neighborhood Senior Center; Strong Place Day Care Center	Senior Center; Child Care Facility	Private
13	185	44	473 Pacific Street	Vest Pocket Playground	Park/Playground	NYC Parks
14	188	14	288 Pacific Street	PS 261 and Playground	School; Park/Playground	DCAS/DOE
15	191	1	450 Pacific Street	PS 38 and Playground	School; Park/Playground	DCAS/DOE
	191	16	480 Pacific Street			
	191	25	482 Pacific Street			
16	192	1	500 Pacific Street	Sarah Jane Hale Vocational High School Annex	School	DCAS/DOE
	192	13	508 Pacific Street			
17	339	7503	340 Court Street	Long Island College Hospital School Of Nursing	College	Private
18	384	16	20 Bergen Street	Mary McDowell Friends School	School	Private
19	391	56	343 Warren Street	Warren Street Center for Children and Families	Child Care Facility	Private
20	392	75	160 Wyckoff Street	Nicholas Naquan Heyward Jr. Park	Park/Playground	NYC Parks
21	**394**	**1**	**280 Wyckoff Street**	**Wyckoff Gardens Neighborhood Senior Center (In NYCHA Campus)**	**Senior Center**	**NYCHA**
22	396	7501	318a Warren Street	Open House Early Childhood Center	Child Care Facility	Private
23	397	11	358 Warren Street	Cobble Hill School of American Studies	School	DCAS/DOE
24	397	18	364 Warren Street	Boerum Park	Park/Playground	NYC Parks/DOE
25	401	1	565 Baltic Street	Alonzo A. Daughtry Memorial Day Care Center	Child Care Facility	Private
26	402	1	261 Court Street	JHS 293 and Playground	School; Park/Playground	DCAS/DOE
27	403	52	115 Butler Street	St. Augustine School	School	Private
28	403	7508	382 Baltic Street	Preschool Of America	School	Private
29	**404**	**1**	**420 Baltic Street**	**RAICES Gowanus Senior Center (In NYCHA Campus)**	**Senior Center**	**Private**
30	409	38	242 Hoyt Street	New Dawn Charter High School	School	DOE

Table 1 (cont'd)
City and Non-City Facilities Within ½-Mile of the Project Site

Map ID No.[1]	Block	Lot	Location/Address	Facility Name/Use	Facility Type	Agency/ Owner
31	**411**	**14**	**Butler Street**	**Gowanus Wastewater Pumping Station**	**Water/Sewer Infrastructure Facility**	**DEP**
32	**412**	**19**	**260 Butler Street**	**Quality Waste Services Corp.**	**Solid Waste Management Facility**	**Private**
33	**419**	**1**	**225 Nevins Street**	**Thomas Greene Playground**	**Park/Playground**	**NYC Parks**
34	437	1	317 Hoyt Street	PS 32 and Playground	School; Park/Playground	DCAS/DOE
35	442	1	375 Court Street	Carroll Park	Park/Playground	NYC Parks
36	448	7	277 3rd Avenue	Rivendell School	School	Private
37	449	15	242 Carroll Street	PS 58 and Playground	School	DCAS/DOE
38	452	5	347 Bond Street	EMS Station 32	EMS Station	FDNY
39	453	26	450 Carroll Street	Just Rubbish Removal LLC	Solid Waste Management Facility	Private
40	455	1	512 Carroll Street	PS 372 the Children's School	School	DOE
41	459	18	342 Smith Street	Hannah Senesh Community School	School	Private
42	468	6	413 Smith Street	Ladybug Preschool	School	Private
43	928	6	25 4th Avenue	Pacific Branch Library	Library	BPL
44	937	41	98 5th Avenue	Park Slope Christian Academy	School	Private
45	940	111	610 Baltic Street	PS 133 William A. Butler School	School	DOE
46	947	8	147 5th Avenue	Eladia's Kids	Child Care Center	Private
47	950	19	40 Lincoln Place	PS 282 and Playground	School; Park/Playground	NYC Parks/DOE
	950	24	180 6th Avenue			
48	952	3	207 4th Avenue	3rd Water Tunnel Shaft 22b	Water/Sewer Infrastructure Facility	DEP
49	958	45	238 5th Avenue	Sunflower Academy	Child Care Center	Private
50	969	52	333 2nd Street	Strong Place for Hope Day Care Center	Child Care Center	ACS
51	979	23	141 6th Street	USA Recycling, Inc.	Solid Waste Management Facility	Private
52	979	31	15 2nd Avenue	Brooklyn Parole Center	Government Office	NYSDOC
53	980	1	383 3rd Avenue	Al-Madinah School	School	Private
54	981	1	298 3rd Street	J.J. Byrne Playground	Park/Playground	NYC Parks
55	981	50	Block bounded by 5th Street, 4th Street, 4th Avenue, and 5th Avenue	Washington Park	Park/Playground	NYC Parks
56	981	111	364 5th Avenue	JHS 51 and Playground	School; Park/Playground	DCAS/DOE
57	977	3	2 2nd Avenue	DSNY Storage/Compositing	Road Salt Storage and Composting	DSNY

Notes: 1. See **Figure 2**.
Facilities shown in **bold** are located within 600 feet of the project site.
NYSDOL = New York State Department of Labor
DCAS = New York City Department of Citywide Administrative Services
DOE = New York City Department of Education
NYPD = New York City Police Department
FDNY = New York City Fire Department
NYC Parks = New York City Department of Parks and Recreation
NYCDOC = New York City Department of Corrections
NYCHA = New York City Housing Authority
DEP = New York City Department of Environmental Protection
BPL = Brooklyn Public Library
ACS = New York City Administration for Children's Services
DSNY = New York City Department of Sanitation
Sources: DCP MapPLUTO 16v2; DCP Selected Facilities and Program Sites 2015 Release.

4.1(c) Suitability of the site to provide cost-effective delivery of the intended services.

On March 2, 2010, the Canal was designated a federal Superfund site under CERCLA and placed on the CERCLA National Priorities List (NPL). On September 27, 2013, the USEPA issued a ROD identifying actions to be undertaken by various parties to remediate contamination in the Canal. As part of the ROD, USEPA mandated the construction of the Gowanus Canal CSO Facilities.

In February 2014, DEP released a siting and planning study for the CSO facilities. This effort included: (1) identification and evaluation of CSO facility components and development of facility footprints to be used in the identification of viable sites on which to locate the facilities, including the CSO facilities, conveyance, and associated infrastructure; and (2) identification of potential sites suitable for locating the CSO facilities, development and evaluation of a shortlist of potential sites, and preparation of conceptual designs associated with those sites.

The siting and planning study for the Head End Facility was based on a conceptual design that included all of the components and features that would be required by the ROD (i.e. an 8-MG tank, with associated influent and effluent channels, screening and debris removal, pumping equipment, space to house instrumentation and controls, electrical equipment, and odor control systems). The conceptual design determined that the facility footprint for an 8-MG facility was approximately 100,000 sf: this includes the approximately 52,000 sf needed for the facility's storage basin, approximately 25,700 sf for the above ground superstructure, and additional space for construction access and required setbacks from property lines.

Using the approximate square footage from the conceptual facility design, a focused site screening effort was conducted to identify potential sites for locating the facility, based on three critical criteria: size of available property; hydraulic analyses and effective capture of CSOs; and current or planned land use in the area. With the application of additional screening criteria—proximity to existing infrastructure, length of conveyance piping required, and complexity of utility crossing or relocation—a total of six potential sites were identified for further analysis. The six potential sites were evaluated and ranked using a multipart evaluation that allowed for the application of numerous screening factors (consisting of engineering criteria as well as land use and environmental criteria) resulting in a quantitative ranking. The two highest-ranked sites were the proposed site at 242 Nevins Street and 234 Butler Street and the Park Property site to the east of Nevins Street. These two sites were further evaluated as the "shortlisted" sites for the facility.

The two short-listed sites were further evaluated using a side-by-side comparison of engineering requirements, environmental issues, sustainability considerations, and costs. The specific criteria for the side-by-side comparison included:

- Engineering requirements: key engineering issues included the complexity and risks associated with the hydraulics and controls needed to move flow from the RH-034 outfall to the facility, the conveyance needed to deliver the flow to and from the facility, the depth of excavation required for construction of the facility, and the complexity of the subsurface utility crossings and relocations related to the conveyance.
- Property acquisition: the need to acquire private property would have an effect on the cost and schedule of the project.
- Construction: construction considerations included the complexities associated with excavation and building at each site, which directly affect the associated cost and risks.
- Environmental: key environmental issues included coordination with other responsible parties under CERCLA to remediate potential soil and groundwater contamination on the sites, potential operational and construction impacts to the surrounding land uses and the nearby community, and

potential impacts on historic and cultural resources. A sustainability analysis was conducted to compare the two shortlisted sites' overall potential impacts and benefits to the community.

- Cost: the overall cost of the facility located at each shortlisted site was estimated, accounting for all of the required design and construction costs as well as associated property acquisition and site restoration costs.

The outcome of the comprehensive analysis of the two shortlisted sites was the recommendation to use 242 Nevins Street and 234 Butler Street (the proposed site) for the facility. In particular, the proposed site is located adjacent to the outfall and the Gowanus Wastewater Pumping Station and force main, and will therefore provide minimal distance for conveyance, resulting in a more efficient design and construction effort, while at the same time providing opportunities for synergies with the existing infrastructure. The longer conveyance to the Park Property would entail significant and complex subsurface utility engineering including the locating, coordinating, and design for utility crossings and relocations. The greater distance to the Park Property would also require deeper structures to provide proper hydraulic operation. Finally, the Park Property would require the displacement of a portion of the public park, a potential negative environmental factor, with the potential for parkland alienation. In particular, during the construction of the CSO facility, temporary relocation of the park would be needed and following completion of the CSO facility, some portion of the park would need to be reconstructed. Due to the additional time needed to reconstruct the park, construction at the Park Property would increase the construction duration by approximately 4 years. In addition, the facility's superstructure would occupy a portion of the current park's footprint, and would therefore result in the permanent loss of this portion of the park if the facility is constructed at the Park Property.

Based on these factors, the planning and siting study determined the proposed site to be the most cost-effective site for the facility: the alternate location at the Park Property would have a higher cost, due primarily to the longer and more complex conveyance infrastructure required to connect to the outfall, as well as the additional cost associated with reconstructing the playground. It would also require a longer construction duration and result in a loss of park space.

DEP submitted a Site Recommendation Report recommending the proposed site for the Head End Facility to USEPA in June 2015. This report also recommended the use of the privately owned parcel at 270 Nevins Street for construction staging. Based on the Site Recommendation Report, on June 9, 2016, USEPA issued the Settlement Agreement directing DEP to construct the Head End Facility at the recommended location; however, under the Settlement Agreement, under certain specified circumstances, USEPA retains the discretion to direct the City to construct the Head End Facility at the Park Property. Consistent with the USEPA mandate under the Settlement Agreement, the project is required to be located at the Head End Facility.

4.1(d) Consistency with the locational and other specific criteria for the facility identified in the Statement of Needs or, if the facility is not listed in the Statement, in a subsequent submission to the Borough President.

The proposed Gowanus CSO Head facility did not appear in the Citywide Statement of Needs (SON).

4.1(e) Consistency with any plan adopted pursuant to Section 197-a of the Charter.

The only 197-a Plan that has been adopted by the City Council, pursuant to Section 197-a for the project site area is the Waterfront Revitalization Program (WRP). An assessment of the Head End Facility's consistency with the WRP as part of the Gowanus Canal CSO Facilities Project is provided in the *Gowanus Canal CSO Facilities DEIS*. That assessment concludes that the Gowanus Canal CSO Facilities would be consistent with the policies of the WRP.

4.2: Procedures for Consultation

4.2(a) Consider the Mayor's and Borough President's strategic policy statements, the Community Board's Statement of District Needs and Budget Priorities, and any published Department of City Planning land use plan for the area.

The Head End Facility is not listed in the 2015 Brooklyn Borough President's 2015 Strategic Policy Statement, although the Statement includes a general goal of protecting water quality throughout Brooklyn and remediating existing water pollution "trouble spots." There are no recent Statements of District Needs issued by Brooklyn Community Board 6 ("CB6"). The Department of City Planning (DCP) is conducting a comprehensive planning study of the Gowanus neighborhood under the City's Planning for Livability, Affordability, Community, Economic Opportunity and Sustainability (PLACES) program; however, currently there are no published DCP land use plans for the area.

4.2(b) Consider any comments received from the Community Boards or Borough Presidents and any alternative sites proposed by a Borough President pursuant to section 204(f) of the Charter, as well as any comments or recommendations received in any meeting, consultations or communications with the Community Boards or Borough Presidents.

In conformance with the requirements of ULURP, the Head End Facility will undergo an extensive public review process, including public hearings to be held by CB6, the Borough President, the City Planning Commission, and the City Council. The ULURP process provides the opportunity for the Community Boards and Borough President to comment on the Head End Facility and to advance any recommendations. [see also Borough President submission under 4.1(d)]

In addition, under the Superfund program, the remediation of the Canal (which includes construction of the Head End Facility) is subject to extensive public review, including coordination with the Gowanus Canal Community Advisory Group (CAG). The CAG is made up by community members, including members of CB6, as well as representatives of tenant associations, neighborhood associations, and local non-profit organizations. Specific to the Head End Facility, prior to the finalization of the Settlement Agreement which directed DEP to construct the facility at the recommended location, USEPA held a public comment period between April 14, 2016 and May 31, 2016 to receive community input on the draft Settlement Agreement. The public comment period included a well-attended public meeting held on April 25, 2016, and a meeting with the CAG on April 26, 2016; numerous public comments were received. Community outreach through the CAG and other public review under Superfund will continue throughout the design and construction of the Head End Facility.

ARTICLE 6: CRITERIA FOR SITING OR EXPANDING REGIONAL/CITYWIDE FACILITIES

6.1: The sponsoring agency and, for actions subject to ULURP or review pursuant to Section 195 of the Charter, the City Planning Commission, shall consider the following criteria:

6.1(a) Need for the facility or expansion.

As discussed above, the Head End Facility is being constructed as part of the Gowanus Canal CSO Facilities Project, which is required under CERCLA.

6.1(b) Distribution of similar facilities throughout the city.

DEP operates a system of 14 WWTPs around the City; each of these facilities is served by infrastructure throughout the five boroughs that have been sited and sized over time to collect wastewater and convey it to the WWTPs. In addition, DEP has constructed a variety of facilities and sewer infrastructure improvements throughout the City that control the discharge of CSO from the combined sewer system. In particular, DEP operates four CSO control facilities located at Flushing

Bay in Queens, Paerdegat Basin in Brooklyn, Spring Creek in Brooklyn, and Alley Creek in Queens. These facilities have been sited at locations that are appropriate to achieve DEP's goal of reducing CSO discharges in order to achieve waterbody-specific water quality standards, and are not in the immediate area of the Head End Facility (the Flushing CSO Facility is approximately 8 miles away from the Head End Facility, the Paerdegat Basin CSO Facility is approximately 5 miles away, the Spring Creek Facility is approximately 6 miles away, and the Alley Creek Facility is approximately 13.5 miles away). DEP has also implemented an extensive green infrastructure program focusing on specific tributary areas (such as Newtown Creek in Brooklyn and the Hutchinson River in the Bronx). These infrastructure improvements, primarily located within the public right-of-way, include bioswales, rain gardens, and stormwater greenstreets that collect stormwater, thereby preventing it from reaching the combined sewer system and reducing CSO discharges during wet weather events. As of 2017, DEP has constructed over 4,000 such green infrastructure improvements, distributed throughout the City.[1] In addition, DEP is constructing or planning to construct high level storm sewers (HLSS) in several areas of the City as a means of reducing CSO discharges. HLSS is a form of partial separation that separates stormwater from streets or other public rights-of-way from combined sewers. HLSS are designed to capture 50 percent of rainfall, before it enters the sewer system, and divert it directly into the waterways through permitted outlets, reducing the volume of flows that pass through the treatment plants and the combined sewer system. In addition, they alleviate street flooding in problematic areas.

As noted above, the Head End Facility was sited at the recommended location in order to fulfill the federal mandate to reduce the volume of CSO entering the Canal. Therefore, as with similar CSO control facilities, the Head End Facility has been sited at an appropriate location and will be part of the wastewater conveyance and treatment infrastructure that is equally distributed throughout the city.

6.1(c) Size of the facility. To lessen local impacts and increase broad distribution of facilities, the new facility or expansion should not exceed the minimum size necessary to achieve efficient and cost-effective delivery of services to meet existing and projected needs.

The CSO facilities are being designed to meet the goals of the USEPA ROD, specifically a 58 to 74 percent reduction in CSO solids discharging to the Canal from the RH-034 and OH-007 outfalls. Analysis of the Head End Facility using modeling simulations determined that the facility would result in an estimated 82 percent CSO volume reduction, and would therefore meet or exceed the ROD goals for CSO solids reduction. As noted above, the facility was the subject of a planning and siting study; this study utilized a conceptual layout for the facility that determined the minimum square footage that would be required for the facility's components and features. Based on the conceptual requirements, the facility is being designed to occupy the minimum amount of space required to achieve the mandated CSO solids reduction to the Canal. The minimum footprint was estimated to be approximately 100,000 sf. The surface layout of the site is currently being designed; however the site may provide some form of waterfront public access along the Canal. Additional public access areas and/or public amenities may be provided on the site and will be determined through additional facility design in consultation with the local community and other City agencies. Space on the site that would not be required for the facility may be made available for public use to the extent feasible. Therefore, the Head End Facility would not exceed the minimum size necessary for CSO control.

6.1(d) Adequacy of the streets and transit to handle the frequency of traffic generated by the facility.

[1] DEP CSO Order on Consent Quarterly Progress Report, First Quarter 2017 (January 1st – March 31st), April 30, 2017.

As discussed in the *Gowanus Canal CSO Facilities DEIS*, operation of the Head End Facility would be largely automated, either in a fully automatic mode or remotely controlled from the RH WWTP, and would not require permanent staffing. As a result, the operation of the facility would generate nominal amounts of operational traffic, transit, and pedestrian trips and would be well below the *CEQR Technical Manual* impact thresholds. Therefore, the facility would not result in any significant adverse transportation impacts.

6.2: Where practicable, the Mayor may initiate and sponsor a consensus building process to determine the location of a proposed regional facility. A Borough President may submit a written request for such a process if the request is made within 90 days of the publication of the Statement of Needs or, if the facility is not listed in the Statement, within 30 days of a subsequent submission to the Borough President.

As noted above, the Head End Facility is not listed in the two most recent Citywide Statement of Needs (Fiscal Years 2017-2018 and 2018-2019). Neither the Mayor nor the Borough President has requested a consensus building process to determine the location of the facility. The location of the facility was determined through a comprehensive site selection study and was mandated by USEPA under the Settlement Agreement.

6.3: Upon the request of the Borough President and/or the community board, a sponsoring agency and community board shall establish a facility monitoring committee, or designate an existing community board committee, to monitor a facility following selection and approval of its site.

Neither the Borough President nor CB6 has requested that a facility monitoring committee be enacted for the Head End Facility. As noted above, community outreach through the CAG and other public review under Superfund will continue throughout the design and construction of the Head End Facility.

6.4: *Transportation and Waste Management Facilities*

6.41 The proposed site should be located to promote effective service delivery in that any alternative site actively considered by the sponsoring agency or identified pursuant to Section 204(f) of the Charter would add significantly to the cost of constructing or operating the facility or would significantly impair effective service delivery.

As noted above, USEPA has directed DEP to construct the Head End Facility at the Head End Site and retains the discretion to direct the City to construct the Head End Facility at an alternate site - the Park Property. As discussed in Section 4.1(c) above, the alternative site for the Head End Facility at the Park Property was considered as part of the site selection study. The analysis of the two short-listed sites for the facility determined that, despite the added cost for property acquisition at the recommended location, construction at the alternate site would be more costly overall. The higher cost for the alternative at the Park Property is due to several factors, including the longer and more complex conveyance infrastructure required to connect to the outfall, as well as the additional cost associated with reconstructing the Thomas Greene Playground following completion of the facility. Therefore, the Head End Facility has been sited at a location that maximizes cost-effective service delivery. The use of any alternate site for construction of a CSO facility other than the two short-listed sites would require additional analysis and engineering studies, which would have schedule and cost implications and would significantly impair DEP's ability to provide the mandated CSO solids reduction in the timeframe mandated by USEPA.

6.42 In order to avoid aggregate noise, odor, or air quality impacts on adjacent residential areas, the sponsoring agency and the City Planning Commission, in its review of the proposal, should take into consideration the number and proximity of existing City and non-City facilities, situated within ½-mile radius of the proposed site, which have similar environmental impacts.

As discussed above under criteria 4.1(b), the Head End Facility is located in an area that is characterized by manufacturing and shipping uses. This area does not contain a large concentration of large-scale non-neighborhood facilities which produce large amounts of noise, odor, or air pollution (such as power plants or solid waste processing facilities), and is generally removed from the surrounding residential areas. Therefore, the Head End Facility would not contribute to an adverse concentration of non-neighborhood facilities that would have the potential for aggregate noise, odor, or air quality impacts on the adjacent residential areas.

8/9/2017

Project Site

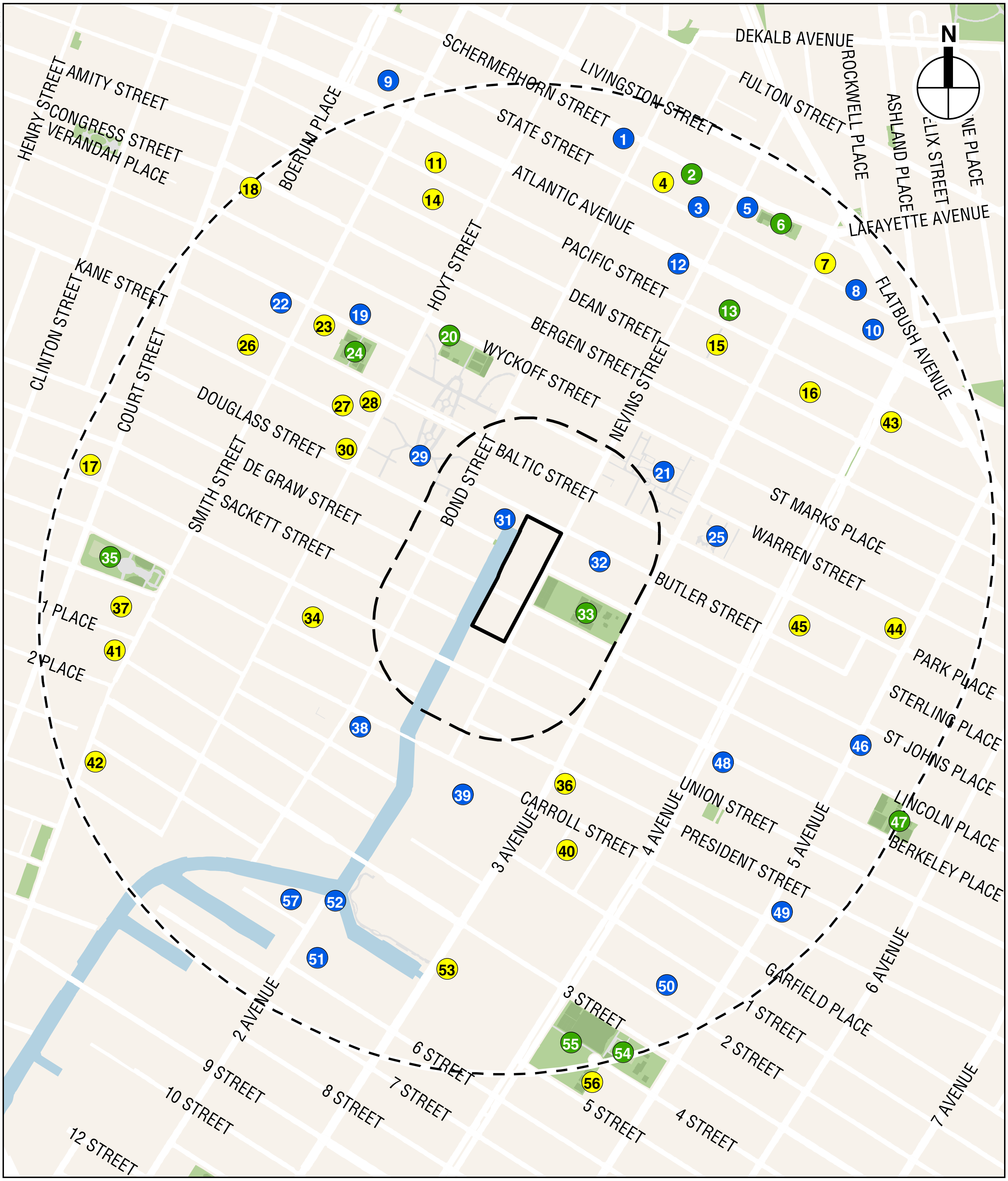
Study Area (600-foot boundary)

Gowanus Canal

Head End Site Existing Condition - Aerial

Gowanus Canal CSO Facilities - Head End Facility

Figure 1



Project Site

Half-mile boundary

Study Area (600-foot boundary)

School/Library

Park / Playground

Other

City and Non-City Facilities
Within ½-Mile of the Project Site
Figure 2

Appendix 7-1
Cultural Resources Appendix

ENVIRONMENTAL REVIEW

Project number: DEPT. ENVIRONMENTAL PROTECTION / 17DEP040K
Project: GOWANUS CANAL COMBINED SEWER OVERFLOW
Date received: 4/7/2017

Comments: as indicated below. Properties that are individually LPC designated or in LPC historic districts require permits from the LPC Preservation department. Properties that are S/NR listed or S/NR eligible require consultation with SHPO if there are State or Federal permits or funding required as part of the action.

The LPC is in receipt of the draft scope of work for EIS dated 3/31/17 and the EAS of 4/4/17. Both sites—Owl's Head and Head End—are within the S/NR eligible Gowanus Canal Historic District.

The DSOW is acceptable for historic and cultural resources.

Additionally, LPC review of archaeological sensitivity models and historic maps indicates that there is potential for the recovery of remains from 19th Century occupation including but not limited to bulkheads or land fill on the project site and industrial resources. See, Hunter Research, Inc. 2004 Draft Report, National Register of Historic Places Eligibility Evaluation and Cultural Resources Assessment for the Gowanus Canal, Brooklyn, NY; In Connection with the Proposed Ecosystem Restoration Study. Accordingly, the Commission recommends that an archaeological documentary study be performed for this site to clarify these initial findings and provide the threshold for the next level of review, if such review is necessary (see CEQR Technical Manual 2014).

Cc: SHPO
MOEC

Gina Santucci 4/21/2017

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 32292_FSO_DNP_04122017.doc

NYC™ Landmarks Preservation Commission
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Fax (212)-669-7960
http://nyc.gov/landmarks

ARCHAEOLOGY

Final Sign-Off (Multiple Sites)

Project number: DEPT. ENVIRONMENTAL PROTECTION / 17DEP040K
Project: GOWANUS CANAL COMBINED SEWER OVERFLOW
Date received: 6/6/2017

Comments: as indicated below. Properties that are individually LPC designated or in LPC historic districts require permits from the LPC Preservation department. Properties that are S/NR listed or S/NR eligible require consultation with SHPO if there are State or Federal permits or funding required as part of the action.

This document only contains Archaeological review findings. If your request also requires Architecture review, the findings from that review will come in a separate document.

Comments: The LPC is in receipt of a request from DEP dated June 6, 2017, asking that LPC to review two related documentary reports, that were not previously submitted to LPC, to concur that further documentary research is not needed and that instead, archaeological monitoring be required as the next step.

The LPC concurs that based upon these studies, and especially the Hunter 2011 report, further archaeological documentary research is not needed at this time. However, we do not concur that an archaeological monitoring plan should be the next step. Instead we recommend that once the likely construction impacts are well understood, that an archaeological scope of work be developed which may include archaeological testing and/or archaeological monitoring (depending upon what is proposed and the potential depth of the potential resource), and that this scope identify the horizontal and vertical locations of potential archaeological resources. It should also describe the different resources that may be impacted by location and period. We recommend that it especially draw upon the Hunter 2011, as well as the sources that the Hunter report cites, for this work.

Cc: NYSHPO

Amanda Sutphin

6/15/2017

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 32292_FSO_ALS_06152017.doc

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ENVIRONMENTAL REVIEW

Project number: DEPT. ENVIRONMENTAL PROTECTION / 17DEP040K
Project: GOWANUS CANAL COMBINED SEWER OVERFLOW
Date received: 6/7/2017

LPC comments revised of this date regarding the architectural resource section of the 6/6/17 Historic Resources submission.

Regarding identification of contributing or non-contributing S/NR resources on the Head End and Owl's Head sites, SHPO is the lead on that identification and LPC defers to the SHPO on that.

On the Head End study area, confirm with SHPO the existence of the "smaller S/NR eligible historic district".

The Pumping Station at 196 Butler St. and 201 Douglass St. appears LPC eligible, and the text should be amended to reflect that. Additionally, the Carroll St. Bridge is LPC designated, and that should be noted in the text.

In order to complete the analysis of the Head End site plan, existing and proposed grade level plans should be included in the document, with the 234 Butler St. buildings included in the plans.

LPC concurs with the DEP plan for an engineering analysis to evaluate preserving all or portions of the S/NR eligible properties at 234 Butler St. The analysis shall be provided to SHPO and LPC for review and comment.

Again, LPC defers to SHPO regarding the S/NR eligibility of the properties on the Owls Head and Head End sites.

Cc: SHPO

Gina Santucci

6/30/2017

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 32292_FSO_GS_06302017.doc

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ENVIRONMENTAL REVIEW

Project number: DEPT. ENVIRONMENTAL PROTECTION / 17DEP040K
Project: GOWANUS CANAL COMBINED SEWER OVERFLOW
Date received: 8/11/2017

Comments: The LPC is in receipt of the draft Historic Resources Chapter of the DEIS dated 8/10/17. The text for architectural and archaeological resources appears acceptable.

cc: SHPO

Gina Santucci 8/18/2017

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 32292_FSO_ALS_08152017.doc

July 3, 2017

Mr. Christos Tsiamis
Remedial Project Manager – Gowanus Canal Site
U.S. Environmental Protection Agency, Region 2
290 Broadway, 20th Floor
New York, NY 10007

Re: EPA
Gowanus Canal Superfund Cleanup
Gowanus Canal area, Brooklyn, NY
16PR02427

Dear Mr. Tsiamis:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

We have reviewed the *Cultural Resources Considerations Gowanus Canal Combined Sewer Overflow (CSO) Facilities* report (NYCDEP, 6 June 2017), provided to our office on June 8th, 2017.

With respect to archaeological resources, SHPO concurs with the proposal that no additional background research is necessary at this time. However, before commenting on the appropriate methods for archaeological field investigation, we recommend that additional information be collected regarding the stratigraphy of the project area, using borings or other such techniques, as well as specifics about the horizontal and vertical extents of planned ground-disturbing activities and the nature of potential resources.

With respect to architectural resources, we offer the following comments:

- We do not concur with the determination that the properties at 242-244 Nevins and 270 Nevins are non-contributing; it is SHPO's opinion that these two buildings continue to contribute to the S/NR0eligible Gowanus Canal Historic District. Their proposed demolition would constitute an Adverse Effect.
- We concur with the determination that the properties at 122 5th Street and 22 2nd Avenue are non-contributing, and therefore we would have no concerns with their proposed demolition.
- To clarify the point about the existence of an earlier, smaller historic district, please note that a preliminary Gowanus Canal historic district was identified in 2004. An expanded Gowanus Canal Historic District, which subsumed the 2004 district, was identified in 2012 through the National Register process. While that

district has not been formally listed in the National Register, its boundaries reflect the current National Register eligible Gowanus Canal Historic District.

- “Figure 9: Historic Resources” incorrectly notes that the 2014 Proposed S/NR Gowanus Canal Historic District “listing no longer being pursued by SHPO”. This should be deleted and replaced with “The NYS Board for Historic Preservation review has been postponed.”
- Regarding the feasibility of partial retention of 234 Butler Street, we recommend retaining as much of building as possible. Partial or full demolition may constitute an Adverse Effect.
- We concur with the recommendation for implementing a Construction Protection Plan for the ASPCA and R.G. Dun & Company buildings, and we strongly recommend implementing a CPP for all contributing properties within the Historic District that are located within 90 feet of any proposed construction.
- We concur with the preliminary determination that removal and replacement of a portion or portions of the historic canal bulkhead at the Owl’s Head site would constitute an Adverse Effect
- For any proposed construction work within the streetbed, we recommend salvaging and reinstalling the historic Belgian block pavers, and/or replacing any unusable ones in kind.
- A discussion of mitigation appears premature at this point, before the design and potential effects of the project are presented and understood in greater detail.

If additional information correspondence is required regarding this project it should be provided via our Cultural Resource Information System (CRIS) at www.nysparks.com/shpo/online-tools/ Once on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an existing project". You will need this project number and your e-mail address. If you have any questions, I can be reached at (518) 268-2182.

Sincerely,

O. S Brazee

Olivia Brazee
Historic Site Restoration Coordinator
olivia.brazee@parks.ny.gov

via e-mail only

August 28, 2017

Mr. Christos Tsiamis
Remedial Project Manager – Gowanus Canal Site
U.S. Environmental Protection Agency, Region 2
290 Broadway, 20th Floor
New York, NY 10007

Re: EPA
Gowanus Canal Superfund Cleanup
Gowanus Canal area, Brooklyn, NY
16PR02427

Dear Mr. Tsiamis:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

We have reviewed the preliminary draft EIS - Historic and Cultural Resources Chapter provided to our office on August 14, 2017. We offer the following comments:

- On page 7-8 please replace "A draft of the National Register of Historic Places Registration (Nomination) Form was prepared on behalf of the SHPO . . . " with "**A draft of the National Register of Historic Places Registration (Nomination) Form was prepared by the SHPO**. . . ."

- The statement on p. 7-9 that ". . . SHPO later in 2014 made a determination that the Gowanus Canal Historic District is S/NR-eligible" is incorrect. The text should be changed to read: "**The SHPO determined the Gowanus Canal S/NR-eligible in 2012 upon completion of a comprehensive survey report of the Gowanus neighborhood prepared by Gregory G. Dietrich, of Dietrich Preservation Consulting, and Alyssa Loorya, of Chrysalis Archeological Consulting, Inc., for the Friends and Residents of Greater Gowanus. This survey established a justifiable boundary for the S/NR-eligible historic district**."

- We feel that it is confusing to state, as you have for several properties (270 Nevins St., 242-244 Nevins St., 22-36 2nd Ave and 114-132 5th St., 110 5th St), that "The building is not identified as Non-Contributing in the Draft National Register Nomination Form." That the Resource Inventory section of the Draft National Register Nomination clearly notes that "All properties are considered contributing resources unless otherwise noted." We suggest that you change your text for the above referenced properties to read more clearly as **"The building is identified as Contributing in the Draft National Register Nomination Form**, ..."

If additional information correspondence is required regarding this project it should be provided via our Cultural Resource Information System (CRIS) at www.nysparks.com/shpo/online-tools/ Once on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an existing project". You will need this project number and your e-mail address. If you have any questions, I can be reached at (518) 268-2168.

Sincerely,

Kathleen A Howe

Kathleen A. Howe
Survey and Evaluation Coordinator
kathy.howe@parks.ny.gov

via e-mail only

October 19, 2017

Mr. Christos Tsiamis
Remedial Project Manager – Gowanus Canal Site
U.S. Environmental Protection Agency, Region 2
290 Broadway, 20th Floor
New York, NY 10007

Re: EPA
Gowanus Canal Superfund Cleanup
Gowanus Canal Area, Brooklyn, NY
16PR02427

Dear Mr. Tsiamis:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project.

We have reviewed the Draft Environmental Impact Statement (DEIS) that was submitted to our office on September 18th, 2017. We understand that this DEIS is being prepared by the NYC DEP for local environmental review, and we note that we will continue to provide our comments and participate in consultation with the understanding that EPA is the lead agency under Section 106.

Based on our review of the project details to date, it appears feasible to retain and incorporate the historic former Gowanus Station building (234 Butler Street) into the project. This building, which has a prominent street presence at the corner (and very edge of) the city's preferred site, has overarching significance for the National Register eligible Gowanus Historic District. Its demolition would adversely affect both the building and the National Register eligible Gowanus Canal Historic District. To destroy this intact, architecturally distinctive example of Brooklyn's civic and industrial heritage would be a disservice to the Gowanus neighborhood and to the city as a whole.

We offer the following comments on the text of the DEIS:

1. With respect to the possible effects to archaeological resources, we restate our previous recommendation (Brazee, 3 July 2017) that for areas that have identified potential for deeply buried archaeological deposits, preliminary stratigraphic investigation (a geoarchaeological study) should be undertaken to assess the nature and extent of potentially culture-bearing deposits within the APE. The results of this investigation would provide the basis for

determining whether further archaeological studies are needed and, if so, the most appropriate method for such work.

2. With respect to the status of 190 Butler Street, CRIS correctly shows that the building is a non-contributing building in the State/National Register-eligible Gowanus Canal Historic District (see page 7-13 of Chapter 7: Historic and Cultural Resources)

3. With respect to the Alternatives chapter, SHPO is of the opinion that the demolition of contributing buildings (including the two Nevins Street properties as well as the above-mentioned 234 Butler) at the Head End site would adversely affect the buildings and the Historic District. We strongly encourage the project to take a hard look at retaining and preserving the former Gowanus Station at 234 Butler Street. It remains unclear to us why the construction of the facility would necessitate demolition of the Gowanus Station, whose 1914 section occupies a relatively small footprint at the very northeastern corner of the site. We find this DEIS inadequate for purposes of Section 106 consideration of alternatives, so we request a digital copy of the NYC DEP engineering analysis referred to therein. We may request further consideration of alternatives under 106, beyond this engineering analysis.

4. With respect to the Alternatives chapter, we agree with some of the conclusions in the Thomas Greene Park property analysis section, however we note that increasing waterfront access at the expense of historic resources is not a valid consideration in this instance. Historically the Gowanus Canal was lined with the industrial buildings and infrastructure that it was built to serve, and this continues to be its character today. Therefore, we feel that removing historic buildings along its edge is not at all justified by furthering citywide goals of increased public waterfront access. It is SHPO's opinion that the Park property alternative represents the least impact to historic resources, as well as the most opportunity to satisfy a variety of land-use requirements and public benefits, and for that reason this alternative should be more seriously considered.

5. We have no concerns with the demolition of the Owls Head properties (122 5th Street and 22 2nd Avenue) because, as stated in our previous letter, these structures do not contribute to the historic district.

6. We note that the properties located at the 6th Street Alternate site are contributing resources to the S/NR eligible Gowanus Canal Historic District (141 6th Street/aka 27-31 2nd Ave), and therefore their removal would adversely affect the buildings and the historic district

We would appreciate if the requested information could be provided via our Cultural Resource Information System (CRIS) at www.nysparks.com/shpo/online-tools/ Once on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an existing project". You will need this project number and your e-mail address. If you have any questions, I can be reached at (518) 268-2182.

Sincerely,

O. S. Brazee

Olivia Brazee
Historic Site Restoration Coordinator
olivia.brazee@parks.ny.gov via e-mail only

CC: Brian Carr, EPA
Charles Vandrei, NYS DEC
Danielle Adams, Ecology & Environment
John Vetter, Ecology & Environment
Rasheed Lucas, NYC DEP
Gina Santucci, NYC LPC

Landmarks Preservation Commission

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November 29, 2017

Rasheed Lucas, Project Manager
Wastewater and Special Projects
Bureau of Environmental Planning and Analysis
New York City Department of Environmental Protection
59-17 Junction Boulevard, 11th Floor
Flushing, NY 11373

RLucas@dep.nyc.gov

Dear Mr. Lucas:

I am writing in reference to Gowanus Canal Combined Sewer Overflow (CSO) Facilities (CEQR# 17DEP040K). The Landmarks Preservation Commission initially reviewed the property as part of the agency review of the Draft Scope of Work for the EIS on April 6, 2017 and subsequently in the review of the Historic and Cultural Resources chapter of the EIS on June 7, 2017. In the review LPC notes that 234 Butler Street (aka, 226 Nevins), 270 Nevins Street and 242-244 Nevins Street are located in the National Register Eligible Gowanus Canal Historic District. The LPC did not identify these properties as LPC eligible. The LPC did identify a building in the radius as LPC eligible, the Pumping Station (aka Flushing Tunnel Building) located at 201 Douglass St. (Brooklyn Block 411, Lot 14). The Commission continues to evaluate the area for potential historic resources.

Sincerely,

Sarah Carroll

Sarah Carroll

Appendix 9-1
Essential Fish Habitat Assessment

NOAA FISHERIES
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
Essential Fish Habitat (EFH) Consultation Guidance
EFH ASSESSMENT WORKSHEET

Introduction:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that federal agencies conduct an essential fish habitat (EFH) consultation with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken that may adversely affect EFH. An adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This worksheet has been designed to assist in determining whether a consultation is necessary and in preparing EFH assessments. This worksheet should be used as your EFH assessment or as a guideline for the development of your EFH assessment. At a minimum, all the information required to complete this worksheet should be included in your EFH assessment. If the answers in the worksheet do not fully evaluate the adverse effects to EFH, we may request additional information in order to complete the consultation.

An expanded EFH assessment may be required for more complex projects in order to fully characterize the effects of the project and the avoidance and minimization of impacts to EFH. While the EFH worksheet may be used for larger projects, the format may not be sufficient to incorporate the extent of detail required, and a separate EFH assessment may be developed. However, regardless of format, the analysis outlined in this worksheet should be included for an expanded EFH assessment, along with additional information that may be necessary. This additional information includes:

- the results of on-site inspections to evaluate the habitat and site-specific effects
- the views of recognized experts on the habitat or the species that may be affected
- a review of pertinent literature and related information
- an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

Your analysis of adverse effects to EFH under the MSA should focus on impacts to the habitat for all life stages of species with designated EFH, rather than individual responses of fish species. Fish habitat includes the substrate and benthic resources (e.g., submerged aquatic vegetation, shellfish beds, salt marsh wetlands), as well as the water column and prey species.

Consultation with us may also be necessary if a proposed action results in adverse impacts to other NOAA-trust resources. Part 6 of the worksheet is designed to help assess the effects of the action on other NOAA-trust resources. This helps maintain efficiency in our interagency coordination process. In addition, further consultation may be required if a proposed action impacts marine mammals or threatened and endangered species for which we are responsible. Staff from our Greater Atlantic Regional Fisheries Office, Protected Resources Division should be contacted regarding potential impacts to marine mammals or threatened and endangered species.

Instructions for Use:

Federal agencies must submit an EFH assessment to NOAA Fisheries as part of the EFH consultation. Your EFH assessment must include:

1) A description of the proposed action.
2) An analysis of the potential adverse effects of the action on EFH, and the managed species.
3) The federal agency's conclusions regarding the effects of the action on EFH.
4) Proposed mitigation if applicable.

In order for this worksheet to be considered as your EFH assessment, you must answer the questions in this worksheet fully and with as much detail as available. Give brief explanations for each answer.

Federal action agencies or the non-federal designated lead agency should submit the completed worksheet to NOAA Fisheries Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (HCD) with the public notice or project application. Include project plans showing existing and proposed conditions, all waters of the U.S. on the project site, with mean low water (MLW), mean high water (MHW), high tide line (HTL), and water depths clearly marked and sensitive habitats mapped, including special aquatic sites (submerged aquatic vegetation, saltmarsh, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges), hard bottom habitat areas and shellfish beds, as well as any available site photographs.

For most consultations, NOAA Fisheries has 30 days to provide EFH conservation recommendations once we receive a complete EFH assessment. Submitting all necessary information at once minimizes delays in review and keeps review timelines consistent. Delays in providing a complete EFH assessment can result in our consultation review period extending beyond the public comment period for a particular project.

The information contained on the HCD website will assist you in completing this worksheet. The HCD website contains information regarding: the EFH consultation process; Guide to EFH Designations which provides a geographic species list; Guide to EFH Species Descriptions which provides the legal description of EFH as well as important ecological information for each species and life stage; and other EFH reference documents including examples of EFH assessments and EFH consultations.

Our website also includes a link to the NOAA EFH Mapper .
We would note that the EFH Mapper is currently being updated and revised. Should you use the EFH Mapper to identify federally managed species with designated EFH in your project area, we recommend checking this list against the Guide to Essential Fish Habitat Designations in the Northeast to ensure a complete and accurate list is provided.

EFH ASSESSMENT WORKSHEET FOR FEDERAL AGENCIES (modified 3/2016)

PROJECT NAME: Gowanus Canal Combined Sewer Overflow Facilities Project

DATE: 08/10/2017

PROJECT NO.:

LOCATION (Water body, county, physical address):
Gowanus Canal, New York City

PREPARER: AKRF, Inc.

Step 1: Use the Habitat Conservation Division EFH webpage's Guide to Essential Fish Habitat Designations in the Northeastern United States to generate the list of designated EFH for federally-managed species for the geographic area of interest. Use the species list as part of the initial screening process to determine if EFH for those species occurs in the vicinity of the proposed action. The list can be included as an attachment to the worksheet. Make a preliminary determination on the need to conduct an EFH consultation.

1. INITIAL CONSIDERATIONS		
EFH Designations	**Yes**	**No**
Is the action located in or adjacent to EFH designated for eggs? List the species: Red hake, winter flounder, windowpane flounder, scup, king mackerel, Spanish mackerel, cobia See Table 1	✔	☐
Is the action located in or adjacent to EFH designated for larvae? List the species: Red hake, winter flounder, windowpane flounder, Atlantic sea herring, Atlantic butterfish, summer flounder, scup, king mackerel, Spanish mackerel, cobia, sand tiger shark*, dusky shark*, sandbar shark* * These species do not have a free-swimming larval stage - these are neonates and early juveniles See Table 1	✔	☐
Is the action located in or adjacent to EFH designated for juveniles? List the species: Pollock, red hake, winter flounder, windowpane flounder, Atlantic sea herring, bluefish, Atlantic butterfish, Atlantic mackerel, summer flounder, scup, black sea bass, king mackerel, Spanish mackerel, cobia, clearnose skate, little skate, winter skate, dusky shark See Table 1	✔	☐

Is the action located in or adjacent to EFH designated for adults or spawning adults? List the species: Pollock, red hake, winter flounder, windowpane flounder, Atlantic sea herring, bluefish, Atlantic butterfish, Atlantic mackerel, summer flounder, scup, black sea bass, king mackerel, Spanish mackerel, cobia, clearnose skate, little skate, winter skate, sandbar shark See Table 1	✔	☐

If you answered 'no' to all questions above, then an EFH consultation is not required - go to Section 5.

If you answered 'yes' to any of the above questions, proceed to Section 2 and complete the remainder of the worksheet.

Step 2: In order to assess impacts, it is critical to know the habitat characteristics of the site before the activity is undertaken. Use existing information, to the extent possible, in answering these questions. Identify the sources of the information provided and provide as much description as available. These should not be yes or no answers. Please note that there may be circumstances in which new information must be collected to appropriately characterize the site and assess impacts. Project plans that show the location and extent of sensitive habitats, as well as water depths, the HTL, MHW and MLW should be provided.

2. SITE CHARACTERISTICS

Site Characteristics	Description
Is the site intertidal, sub-tidal, or water column?	Subtidal and water column habitats are present at the project site.
What are the sediment characteristics?	Sediments in the Gowanus Canal are a dark gray to black mixture of sand, silt, and clay. Surficial soft sediments 1 to 20 feet in thickness also contain variable amounts of gravel, organic matter, and debris.
Is there submerged aquatic vegetation (SAV) at or adjacent to project site? If so describe the SAV species and spatial extent.	There is no SAV at or adjacent to the project site.
Are there wetlands present on or adjacent to the site? If so, describe the spatial extent and vegetation types.	The Gowanus Canal is mapped by NWI as an estuarine subtidal wetland with an unconsolidated bottom that is permanently flooded and has been excavated, and by DEC as a littoral zone tidal wetland. These wetlands, with the exception of two small areas near the Owls Head facility that are vegetated with saltmarsh cordgrass, do not meet the definition of wetlands under the Clean Water Act due to lack of hydrophytic vegetation. A small portion of the Canal outside the project area is mapped by NWI as a riverine unknown perennial wetland with an unconsolidated bottom that is permanently flooded.

Is there shellfish present at or adjacent to the project site? If so, please describe the spatial extent and species present.	Blue mussels and various species of crab (e.g., Pacific shore crab, green grab, mud crab, blue crab) can be found in the Gowanus Canal, but occur most often near its confluence with Gowanus Bay and in the Bay itself. The distribution of these species within the Canal is largely influenced by sediment particle size, temperature, salinity, and dissolved oxygen levels.
Are there mudflats present at or adjacent to the project site? If so please describe the spatial extent.	There are no mudflats at or adjacent to the project site.
Is there rocky or cobble bottom habitat present at or adjacent to the project site? If so, please describe the spatial extent.	Apart from the gravel that can be found in surficial sediments, there is no rocky or cobble bottom habitat at or adjacent to the project site.
Is Habitat Area of Particular Concern (HAPC) designated at or near the site? If so for which species, what type habitat type, size, characteristics?	There are no HAPCs in the vicinity of the project site.
What is the typical salinity, depth and water temperature regime/range?	Between 2000 and 2015, based on Harbor Survey water quality data, temperatures at the mouth of the Canal ranged from 33.3 to 80.7 degrees Fahrenheit. Salinity ranged from 0.82 psu to 31.5 psu.
What is the normal frequency of site disturbance, both natural and man-made?	The existing underwater environment in the vicinity of the project sites experiences disturbance from recreational and small commercial vessels, as well as natural disturbance from tidal action. The Canal was historically used for larger shipping vessels, but it hasn't been dredged to accommodate this for some time. Due to the level of existing shoreline development in the area, human and vehicular activity along the shoreline is common. Natural disturbances in the form of periodic extreme storm events are infrequent, but can be significant.
What is the area of proposed impact (work footprint & far afield)?	The area of proposed in-water impact includes: 550 square feet within the turbidity curtain and temporary cofferdam at outfall RH-038, if in-water work is required; 500 square feet within the turbidity curtain and temporary cofferdam at outfall OH-007; and 650 square feet within the footprint of the replacement bulkhead that will extend approximately two feet waterward into the Canal at the Owls Head Site. The project will also result in temporary underwater noise increases that will extend across the width of the channel during pile driving activities (via vibratory hammer).

<u>Step 3</u>: This section is used to describe the anticipated impacts from the proposed action on the physical/chemical/biological environment at the project site and areas adjacent to the site that may be affected.

3. DESCRIPTION OF IMPACTS

Impacts	Y	N	Description
Nature and duration of activity(s). Clearly describe the activities proposed and the duration of any disturbances.			The project is the construction of two CSO facilities (Head End and Owls Head Facilities) on the shores of the Gowanus Canal to reduce the volume of combined sewer overflow entering the Canal. The Head End Facility will be at the head of the Canal and includes upgrades to five outfalls, all of which is expected to be completed on land. In-water construction may be necessary for RH-038, and if so, it will be done within a cofferdam and turbidity curtain to minimize impacts to aquatic resources. The Owls Head Facility will include demolition and construction of a new outfall OH-007 conducted within a cofferdam and turbidity curtain, and a replacement bulkhead that extends two feet waterward along approximately 320 linear feet of the existing bulkhead. The cofferdams, driven via vibratory hammer, and the turbidity curtains for the outfalls, will be installed prior to the commencement of in-water construction activities, and will be removed via vibratory hammer when the work is completed, likely after 6-9 months.
Will the benthic community be disturbed? If no, why not? If yes, describe in detail how the benthos will be impacted.	✔	☐	In-water construction activities at RH-038, if necessary, will result in temporary loss of 550 square feet of benthic habitat within the cofferdam and turbidity curtain. The use of a cofferdam and turbidity curtain at outfall OH-007 will result in temporary loss of 500 square feet of benthic habitat. Sediment resuspension from installation and removal of the cofferdams will result in temporary and localized increases in turbidity. Installation and removal of the cofferdams will also result in temporary increases in underwater noise during driving of the sheet pile with a vibratory hammer. This will be an intermittent disturbance and will have a limited effect on suspended sediment concentrations at any given location over the course of construction. Benthic organisms will likely avoid ensonified areas during use of the vibratory hammer. The waterward installation of the replacement bulkhead will result in the loss of approximately 650 square feet of bottom habitat along approximately 320 linear feet of shoreline at the Owls Head Site (mudline to MHW). This minimal loss of habitat similar to that found throughout the Canal is not expected to result in significant adverse effects to the benthic community.
Will SAV be impacted? If no, why not? If yes, describe in detail how the SAV will be impacted. Consider both direct and indirect impacts. Provide details of any SAV survey conducted at the site.	☐	✔	There is no SAV in the vicinity of the project site.
Will salt marsh habitat be impacted? If no, why not? If yes, describe in detail how wetlands will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?	✔	☐	Two small areas (totaling less than 0.05 acres) near the Owls Head facility that are vegetated with saltmarsh cordgrass [Spartina alterniflora]) would be permanently lost due to the replacement of the bulkhead.

Will mudflat habitat be impacted? If no, why not? If yes, describe in detail how mudflats will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?	☐	✔	There is no mudflat habitat in the vicinity of the project site.
Will shellfish habitat be impacted? If so, provide in detail how the shellfish habitat will be impacted. What is the aerial extent of the impact? Provide details of any shellfish survey conducted at the site.	✔	☐	There is no known shellfish population at the projects sites, and shellfish habitat will not be adversely affected by the proposed project. Any shellfish present at the time will be lost within the 650-square-foot footprint of the replacement bulkhead, but similar habitat continue will be available in the area. If present, shellfish will be temporarily affected by the minimal increases in suspended sediment during installation and removal of the cofferdams. Temporary increases in turbidity are expected to be minimal and localized, and suspended sediments will dissipate upon cessation of the sediment disturbing activities.
Will hard bottom (rocky, cobble, gravel) habitat be impacted at the site? If so, provide in detail how the hard bottom will be impacted. What is the aerial extent of the impact?	☐	✔	There is no hard bottom habitat in the vicinity of the project site.
Will sediments be altered and/or sedimentation rates change? If no, why not? If yes, describe how.	✔	☐	Existing sediments will be lost in the 650-square-foot footprint of the replacement bulkhead (replaced with the bulkhead structure). No other alterations will occur, and sedimentation rates will not be altered as a result of the project.
Will turbidity increase? If no, why not? If yes, describe the causes, the extent of the effects, and the duration.	✔	☐	There may be a temporary increase in turbidity during installation and removal of the sheetpile cofferdams and the installation of the replacement bulkhead. Turbidity curtains would be installed outside the cofferdams, and all in-water construction activities associated with demolition and construction of outfall OH-007 will occur within a the cofferdams. There will be minimal sediment resuspension associated with installation and removal of the sheet pile, and any localized increases in turbidity will be temporary; sediments will dissipate with the flow of water through the Canal following cessation of the sediment disturbing activity. Installation and removal of the cofferdams will be an intermittent disturbance and will have a limited effect on suspended sediment concentrations at any given location over the course of construction. In total, in-water construction activities will last 6-9 months.

Will water depth change? What are the current and proposed depths?	☐	✔	Water depths will not change as a result of the project.
Will contaminants be released into sediments or water column? If yes, describe the nature of the contaminants and the extent of the effects.	✔	☐	Temporary resuspension of sediments and associated contaminants will occur during installation and removal of the cofferdams and replacement of the bulkhead. The effects of this sediment disturbance will be minimized through the use of turbidity curtains for the duration of outfall replacement and modification, including removal of the cofferdams. Any sediment and contaminant resuspension will be minor and sediments will settle quickly over similar substrate following cessation of construction activities.
Will tidal flow, currents, or wave patterns be altered? If no, why not? If yes, describe in detail how.	☐	✔	The project will not result in alterations to tidal flow, currents, or wave patterns.
Will water quality be altered? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration of the impact.	☐	✔	Any increase in turbidity will be temporary and localized, and will dissipate with the flow of water through the Canal. No adverse long term effects to water quality will occur as a result of the project. The purpose of the project is to reduce the volume of combined sewer overflow entering the Canal, and the improvements to the outfalls are expected to contribute to improvements in water quality.
Will ambient noise levels change? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration and degree of impact.	✔	☐	Ambient noise levels will temporarily increase during installation and removal of the sheetpile cofferdams. Installation and removal of the cofferdams and the sheetpile bulkhead will be done with a vibratory hammer. The Canal is narrow at both the Head End and Owls Head Sites, and its full width would likely have elevated underwater noise levels during vibratory driving of the sheet pile. Most of the Canal between the two locations and downstream of the Owls Head Site would be non-ensonified at any given time. Since most finfish that occur in the Canal are migratory rather than resident species, and generally occur in higher numbers near Gowanus Bay, fish would be able to avoid the ensonified portions of the Canal during use of the vibratory hammer. The temporary loss of potential foraging habitat during pile driving, when compared with similar habitat in the area, will not result in significant adverse impact to EFH.
Does the action have the potential to impact prey species of federally managed fish with EFH designations?	✔	☐	The project will result in temporary disturbance of up to 1,050 square feet of benthic and water column habitat within the cofferdams, and permanent loss of 650 square feet of benthic and water column habitat in the footprint of the replacement bulkhead. During construction, the effects of sediment disturbance associated with the outfall reconstruction/modification will be minimized through the use of turbidity curtains. Forage fish may avoid the project area during sheet pile installation while underwater noise levels are temporarily and intermittently elevated. Fish are expected to relocate to similar suitable habitat in the area and return following the completion of pile driving. The area within the cofferdams will once again be available to forage species when the sheet pile is removed. The permanent loss of 650 square feet of bottom and water column habitat is minimal compared to the similar habitat that will continue to be available in the area. Therefore, the proposed project will not have a significant adverse effect on prey species of fish with EFH designations.

Step 4: This section is used to evaluate the consequences of the proposed action on the functions and values of EFH as well as the vulnerability of the EFH species and their life stages. Identify which species (from the list generated in Step 1) will be adversely impacted from the action. Assessment of EFH impacts should be based upon the site characteristics identified in Step 2 and the nature of the impacts described within Step 3. The Guide to EFH Descriptions webpage should be used during this assessment to determine the ecological parameters/preferences associated with each species listed and the potential impact to those parameters.

4. EFH ASSESSMENT

Functions and Values	Y	N	Describe habitat type, species and life stages to be adversely impacted
Will functions and values of EFH be impacted for:			
Spawning If yes, describe in detail how, and for which species. Describe how adverse effects will be avoided and minimized.	✔		Spawning winter flounder may be present during Jan-Apr, and windowpane may be present in May; both are more likely to occur near the mouth of the Canal or in Gowanus Bay rather than near the project sites. Driving of the sheetpile cofferdams via vibratory hammer will be temporary and intermittent and will minimize effects of underwater noise. Turbidity curtains and cofferdams will minimize the effects of temporary sediment resuspension during in-water construction. Fish may avoid the project sites during construction, but the availability of similar habitat in the area will minimize the effects to spawning habitat. The permanent loss of 650 square feet of bottom habitat likewise will not adversely affect spawning due to the availability of similar habitat in the Canal and in Gowanus Bay.
Nursery If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	✔		Windowpane and winter flounder larvae are benthic and could be affected by cofferdam installation and removal and installation of the replacement bulkhead. If present, larvae in the project area could be temporarily impacted by minor increases in suspended sediment during sheetpile installation and removal; these increases will be minimized with the use of turbidity curtains for the duration of in-water work for the outfalls. Driving of the sheetpile via vibratory hammer will be temporary and intermittent, and will minimize effects of increased underwater noise. Larvae and young juveniles may avoid the area during pile driving, but are expected to return when pile driving is finished. Temporary effects and the loss of 650 square feet of bottom and water column habitat will not adversely affect nursery habitat due to the continued availability of similar habitat in the area.
Forage If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	✔		The project will result in temporary effects on foraging habitat for windowpane, summer flounder winter flounder, and skates, which are primarily benthic feeders. The effects of sediment disturbance during cofferdam installation and removal will be minimized through the use of turbidity curtains. Driving of the sheet pile via vibratory hammer will be temporary and intermittent, and will minimize the effects of increased underwater noise. These temporary effects may lead to avoidance of the project area by some fish, but will not have a significant adverse effect on foraging habitat since similar habitat will continue to be available in the vicinity and fish are expected to return upon completion of in-water work activities. The permanent loss of 650 square feet of bottom and water column habitat represents a minimal loss of foraging habitat, and similar habitat will continue to be available in the Canal and connected waterbodies.
Shelter If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.		✔	The project will not result in the creation or elimination of sheltering habitat for EFH species.

Will impacts be temporary or permanent? Please indicate in description box and describe the duration of the impacts.			Temporary impacts include: increased suspended sediment and localized turbidity; increased underwater noise during cofferdam installation and removal; and loss of up to 1,050 square feet of benthic and water column habitat within the cofferdams and turbidity curtains for RH-038 and OH-007. In-water construction is expected to occur over a total of 6-9 months, including installation and removal of the cofferdams and turbidity curtains. Fish may avoid the project areas during construction, but are expected to return upon completion of the project. Permanent impacts include: loss of 650 square feet of benthic and water column habitat along 320 linear feet of shoreline in the footprint of the replacement bulkhead at the Owls Head Site. This minimal loss of habitat similar to that found throughout the Canal is not expected to result in significant adverse effects to EFH.
Will compensatory mitigation be used? If no, why not? Describe plans for mitigation and how this will offset impacts to EFH. Include a conceptual compensatory mitigation plan, if applicable.	☐	✔	Due to the nature of the project impacts (temporary and minor), compensatory mitigation is not required for the proposed project.

Step 5: This section provides the federal agency's determination on the degree of impact to EFH from the proposed action. The EFH determination also dictates the type of EFH consultation that will be required with NOAA Fisheries.

Please note: if information provided in the worksheet is insufficient to allow NOAA Fisheries to complete the EFH consultation additional information will be requested.

5. DETERMINATION OF IMPACT

Federal Agency's EFH Determination		
Overall degree of adverse effects on EFH (not including compensatory mitigation) will be: **(check the appropriate statement)**	☐	**There is no adverse effect on EFH or no EFH is designated at the project site.** **EFH Consultation is not required.**
	✔	**The adverse effect on EFH is not substantial. This means that the adverse effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations.** **This is a request for an abbreviated EFH consultation.**
	☐	**The adverse effect on EFH is substantial.** **This is a request for an expanded EFH consultation.**

Step 6: Consultation with NOAA Fisheries may also be required if the proposed action results in adverse impacts to other NOAA-trust resources, such as anadromous fish, shellfish, crustaceans, or their habitats as part of the Fish and Wildlife Coordination Act Some examples of other NOAA-trust resources are listed below. Inquiries regarding potential impacts to marine mammals or threatened/endangered species should be directed to NOAA Fisheries' Protected Resources Division.

6. OTHER NOAA-TRUST RESOURCES IMPACT ASSESSMENT

Species known to occur at site (list others that may apply)	Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.
alewife	See Attachment 1
American eel	See Attachment 1
American shad	See Attachment 1
Atlantic menhaden	See Attachment 1
blue crab	See Attachment 1
blue mussel	See Attachment 1
blueback herring	See Attachment 1

Eastern oyster	See Attachment 1
horseshoe crab	See Attachment 1
quahog	See Attachment 1
soft-shell clams	See Attachment 1
striped bass	See Attachment 1
other species:	Not applicable

Useful Links

National Wetland Inventory Maps

EPA's National Estuaries Program

Northeast Regional Ocean Council (NROC) Data

Mid-Atlantic Regional Council on the Ocean (MARCO) Data

Resources by State:

Maine
Eelgrass maps

Maine Office of GIS Data Catalog

Casco Bay Estuary Partnership

Maine GIS Stream Habitat Viewer

New Hampshire
New Hampshire's Statewide GIS Clearinghouse, NH GRANIT

New Hampshire Coastal Viewer

Massachusetts
Eelgrass maps

MADMF Recommended Time of Year Restrictions Document

Massachusetts Bays National Estuary Program

Buzzards Bay National Estuary Program

Massachusetts Division of Marine Fisheries

Massachusetts Office of Coastal Zone Management

Rhode Island
Eelgrass maps

Narraganset Bay Estuary Program

Rhode Island Division of Marine Fisheries

Rhode Island Coastal Resources Management Council

Connecticut

Eelgrass Maps

Long Island Sound Study

CT GIS Resources

CT DEEP Office of Long Island Sound Programs and Fisheries

CT Bureau of Aquaculture Shellfish

Maps CT River Watershed Council

New York

Eelgrass report

Peconic Estuary Program

NY/NJ Harbor Estuary

New Jersey

Submerged Aquatic Vegetation mapping

Barnegat Bay Partnership

Delaware

Partnership for the Delaware Estuary

Center for Delaware Inland Bays

Maryland

Submerged Aquatic Vegetation mapping

MERLIN

Maryland Coastal Bays Program

Virginia

Submerged Aquatic Vegetation mapping

The following information is provided in response to Step 6 "Other NOAA-Trust Resources Impact Assessment" of the EFH Assessment Worksheet.

Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.

Alewife

Alewife (*Alosa pseudoharengus*) is a pelagic species that can occur in the New York Harbor from spring to fall, and may occur in the Gowanus Canal. During the spring months, this species migrates through the New York Harbor to spawning grounds in the Hudson, Raritan, and Navesink Rivers, where eggs are deposited in slow-flowing water over a variety of substrates (Mackenzie 1990, Pardue 1983). Peak abundance of larval alewife in estuaries occurs in waters with salinities of 1-5 parts per thousand (ppt) at the surface and 1-15 ppt at the bottom (Locke and Courtenay 1995). Most juveniles emigrate from freshwater estuarine nursery habitats in the rivers where they were spawned between June and November of their first year (Pardue 1983). Adult alewife school in open waters and occupy a variety of inshore ocean, estuarine, and freshwater habitats depending on the season (Hildebrand 1963). They are only associated with bottom structure or substrate during spawning, which occurs in rivers and tributaries. Larval and juvenile alewife feed on small invertebrates, and adults feed on fish eggs, insects, crustacean eggs and larvae, and smaller fish.

Given that alewife are pelagic, and neither spawning nor nursery habitat occurs within Canal, the proposed project will not adversely affect this species. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on alewife.

American Eel

American eel (*Anguilla rostrata*) can occur in the New York Harbor year-round and may occur in the Gowanus Canal. This species is catadromous, spending most of its life in fresh water and spawning in salt water. They occur in streams and rivers with continuous flow over muddy or silty substrate (Scott and Scott 1988). During the day they tend to rest in undercut banks and deep pools near logs or boulders (Fischer 1978). At sexual maturity, adults migrate from the Hudson, Raritan, and Navesink Rivers and their tributaries to spawning grounds in the Sargasso Sea (Mackenzie 1990). American eels have several life stages: egg, glass, elver, yellow, and silver. Eggs hatch on the ocean surface in the Sargasso Sea and drift with currents for about a year as they develop into larvae before reaching the Atlantic coast (USFWS 2015). Glass eels, or larvae, are about 2-3 inches long by the time they reach the coast, and metamorphose into elvers, or juveniles, in nearshore areas of estuaries and tidal rivers (USFWS 2015, Fischer 1978). Elvers transform into yellow eels, which are sexually immature adults, and can spend up to 40 or more years living in freshwater habitats before they mature into silver eels and migrate to the Sargasso Sea to spawn; eels that remain in brackish waters tend to mature earlier than those in freshwater (USFWS 2015). American eels feed on a variety of things, including insects, fish, fish eggs, crabs, worms, clams, and frogs (USFWS 2011).

Given that American eel are pelagic, and neither spawning nor nursery habitat occurs within Canal, the proposed project will not adversely affect this species. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on American eel.

American Shad

American shad (*Alosa sapidissima*) is a schooling pelagic species that can occur in the New York Harbor year-round, and may occur in the Gowanus Canal. This species migrates from offshore waters to spawning grounds in the freshwater tidal areas of the Hudson River; they can tolerate moderate salinity but spawn in lower salinity waters over sand and gravel (Leggett 1976, Walberg and Nichols 1967). Spawning occurs over a variety of substrates, but preferably over sand and gravel bottom with sufficient water movement to eliminate silt deposits (Stier and Crance 1985). Larvae prefer brackish waters with salinities of 7 ppt or less (Leim 1924). Larvae and juveniles start to migrate into the open ocean during the fall, and adults spend most of their lives in offshore ocean waters. Larval and juvenile shad feed mainly on aquatic insects and crustaceans, and adults are primarily plankton feeders (Stier and Crance 1985).

Given that American shad are pelagic, and neither spawning nor nursery habitat occurs within Canal, the proposed project will not adversely affect this species. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/rehabilitation. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on American shad.

Atlantic Menhaden

Atlantic menhaden (*Brevoortia tyrannus*) can occur in the New York Harbor year-round, and may occur in the Gowanus Canal. This species migrates seasonally along the Atlantic coast, moving north through the Mid-Atlantic Bight during spring, and south to Cape Hatteras during the fall (Able and Fahay 1998). Adults are found near surface waters, typically in shallow areas overlying the continental shelf, and they occur in greatest abundance adjacent to major estuaries (Jones et al. 1978). They move inshore during the summer and into deeper waters in the winter. Spawning occurs in continental shelf waters and in the lower reaches of estuaries and coastal bays in waters up to 10 meters deep (Dovel 1971, Rogers and Van Den Avyle 1989). Larvae and juveniles use estuaries during the summer before migrating offshore in the fall (Dovel 1971). Concentrations of young menhaden occur in inshore estuarine waters along the entire Atlantic coast (Rogers and Van Den Avyle 1989). Larvae feed on plankton, and juveniles and adults are filter feeders.

Given that Atlantic menhaden are pelagic, and neither spawning nor nursery habitat occurs within Canal, the proposed project will not adversely affect this species. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on Atlantic menhaden.

Blue Crab

Blue crab (*Callinectes sapidus*) can occur in the New York Harbor year-round, and has been observed near the mouth of the Gowanus Canal. Mating season occurs from May through October in the mid-Atlantic in the upper areas of estuaries and lower portions of rivers (Hill et al. 1989). Females generally spawn in high salinity waters between 2 and 9 months after mating (Hill et al. 1989). Eggs are deposited as a cohesive mass that remains attached to the female until larvae, called zoeae, emerge (Hill et al. 1989). Zoeae molt multiple times over the course of about 1-1.5 months, transforming into megalops, or the second larval stage, which is crablike in appearance; development into the juvenile "first crab" stage is characterized by adult proportions and appearance after 6-20 additional days (Hill et al. 1989). Areas of submerged aquatic vegetation in high salinity estuarine waters are used as nursery areas (Heck and Thoman 1984). Juveniles gradually migrate into shallower, less saline waters of upper estuaries and rivers, where they grow and mature into adults through a series of molt and intermolt phases over the course of about 12-18 months (Hill et al. 1989). Blue crabs move from shallow areas and tributaries in the summer to deeper waters in the fall (Mackenzie 1990). When not mating, small blue crabs prefer shallow, high salinity waters over substrates of soft detritus, mud, or mud-shell; larger crabs generally prefer deeper estuarine waters with hard bottom substrates (Hill et al. 1989). As detritivores and scavengers, blue crabs feed on a variety of phytoplankton, invertebrates, fish, and other crabs.

The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Blue crabs are motile and are not expected to be adversely impacted by project activities. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on blue crabs.

Blue Mussel

Blue mussel (*Mytilus edulis*) is a valuable commercial species and is widely distributed and locally abundant in the north and mid-Atlantic regions; it is most common in the littoral and sublittoral zones of oceanic and estuarine waters and can occur in the New York Harbor year-round. Blue mussels have been observed near the mouth of the Gowanus Canal. This species is a bivalve mollusk that filter-feeds on phytoplankton and particulate detritus from the water (Rice 2010). Adult mussels typically reach shell lengths of about 4 inches and attach to hard surfaces, including large boulders, pebbles, and other mussels (Rice 2010, Newell 1989). Eggs are released into the water column for fertilization and hatch after about 5 hours (Newell 1989). Blue mussels go through several larval stages lasting between 15 days and 6 months after hatching. After about 6 months, the mussel temporarily attaches to filamentous substrates and develops as a juvenile for up to 2 years (Newell 1989). Juveniles grow to approximately 1.5 mm while attached to filamentous algae, and then are carried by currents until they reattach to a hard substrate (Newell and Moran 1989). Following the juvenile stage, adults live in habitats ranging from flat intertidal shores to vertical surfaces subject to wave splash (Newell 1989). They are typically found in subtidal and intertidal environments over a wide range of salinities (5-35 ppt) and depths ranging from 16 to 32 feet (Zagata et al. 2008).

While no shellfish habitat has been identified in the project areas, if they are present, any blue mussels within the 650 square-foot footprint of the replacement bulkhead will be lost. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. No adverse effects to blue mussel habitat are anticipated.

Blueback Herring

Blueback herring (*Alosa aestivalis*) is a schooling pelagic species that can occur in the New York Harbor, and may occur in the Gowanus Canal. Blueback herring adults spend much of their lives in salt water and return to freshwater tributaries to spawn over gravel and sand substrates (Loesch 1969) and would likely only occur in the project area between April and June during migrations into freshwater spawning habitats and back into inland coastal waters post-spawn. Spawning occurs in swift-flowing, deeper stretches of rivers over hard substrate, and in slower-flowing tributaries and flooded areas with soft substrates (Pardue 1983). Eggs adhere to vegetation, rocks, and debris in fresh water where they are deposited. Blueback herring remain in freshwater habitats as larvae and migrate to low salinity estuarine water as juveniles, generally between June and November of their first year (Loesch 1969, Pardue 1983). Larval and juvenile blueback herring feed on small invertebrates, and adults feed on fish eggs, insects, crustacean eggs and larvae, and smaller fish.

Given that blueback herring are pelagic, and neither spawning nor nursery habitat occurs within Canal, the proposed project will not adversely affect this species. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on blueback herring.

Eastern Oyster

Eastern oyster (*Crassostrea virginica*) can occur in the deeper waters of the New York Harbor year-round, but have not been observed near the Gowanus Canal. Adult oysters are non-motile and typically live in clumps, or beds. In mid-Atlantic waters, they prefer water depths ranging from 2 to 16 feet (MacKenzie, Jr. 1996). Spawning occurs via release of eggs into the water, where they are fertilized; eggs and young larvae remain in the water column for 2-3 weeks (Stanley and Sellers 1986). Juveniles, or spat, develop in the water column and attach to hard surfaces such as stones or other oyster shells, usually in established oyster beds, about 2-3 weeks after spawning. This species tolerates a wide range of salinity, generally between 5 and 32 ppt. Sufficient water currents are necessary to flush suspended sediments, remove debris, and transport food over oyster beds. Oyster larvae feed largely on plankton, while adult oysters filter-feed on diatom plankton, dinoflagellates, ostracods, small eggs, and anything else in the water that is 3-4 micrometers in size, including bacteria (Stanley and Sellers 1986).

There are no known natural or man-made oyster beds in the vicinity of the proposed project. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Since there is no oyster habitat in the vicinity of the project sites, the proposed project will not adversely affect this species.

Horseshoe Crab

Horseshoe crab (*Limulus polyphemus*) can occur in the New York Harbor and may be found in the Gowanus Canal. Adult horseshoe crabs migrate from deep offshore waters from April to July to spawn. Eggs are deposited on beaches in the upper portion of the intertidal zone and below the feeding zone of shorebirds (USACE 2009). Spawning habitat depends on ready access to open and undisturbed sandy beaches in relatively calm waters, with a portion of the beach at or above Mean High Water where eggs are laid and larvae develop (Bain et al. 2007). Beach quality, including slope, width, and sediment grain size, can influence spawning activity (Bain et al. 2007); beach slope between 7 and 10° is thought to be optimal for horseshoe crab spawning habitat (USACE 2009). Females make several nests during one beach trip and often return on successive tides to lay more eggs (MDNR 2016). After about one month, the eggs hatch and larvae remain in the intertidal flats or shoal waters where they were spawned until settling to the bottom to molt (USACE 2009, MDNR 2016). During its first 2-3 years, the horseshoe crab molts several times per year, and then about once annually until it reaches sexual maturity around 9-11 years in age (MDNR 2016). Adults remain in deep offshore habitats during most of the year, except during the spawning season. Horseshoe crabs feed mainly on marine worms and shellfish, and serve as an important food source to shorebirds and juvenile sea turtles. Migratory shorebirds rely on horseshoe crab eggs to survive their journey to breeding grounds (MDNR 2016). Horseshoe crab eggs and larvae are also a food source for a variety of species including crabs, whelks, striped bass, white perch, American eel, killifish, silver perch, weakfish, kingfish, silversides, summer flounder, and winter flounder (MDNR 2016).

There are no suitable beaches in the Gowanus Canal, therefore, horseshoe crab spawning will not be adversely affected by the proposed project. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on horseshoe crab.

Quahog

Northern quahog (*Mercenaria mercenaria*), also known as hard clams, can occur in the New York Harbor year-round and may be found in the Gowanus Canal. Hard clams are found in the intertidal and subtidal zones of bays and estuaries in waters up to 15 meters deep, most often in higher salinity waters (Stanley and DeWitt 1983). They can be found in all sediment types, but prefer sediments that are a mixture of sand and mud with some coarse material. Adults burrow an average of 2 centimeters into sand, and an average of just one centimeter into softer substrates; adults can escape 10-50 cm of overburden if buried and can re-burrow if removed from the substrate (Stanley and DeWitt 1983). Eggs are released into the water column for fertilization and are carried by tidal and coastal currents for about 10 hours before hatching. Larvae develop 12-14 hours after hatching and drift up and down through the water column until they reach about 2-3 millimeters in length. At this time, the shell begins to thicken and larvae transform into seed clams, which begin a final migration to their ultimate habitat, settling as adults in their second summer (Stanley and De Witt 1983). Adult clams filter plankton and microorganisms from the water that are carried close to the bottom by currents.

While no shellfish habitat has been identified in the project areas, if they are present, any hard clams within the 650 square-foot footprint of the replacement bulkhead will be lost. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. No adverse effects to hard clam habitat are anticipated.

Soft-shell Clams

Soft-shell clams (*Mya arenaria*) can occur in the New York Harbor year-round and may be found in the Gowanus Canal. This species inhabits sandy, sand-mud, or sandy clay bottoms of inlets and bays, typically at water depths of 3-4 meters and salinities no less than 4-5 ppt (Abraham and Dillon 1986). Adults burrow up to 30 centimeters into the substrate, with siphons extending to the sediment surface to feed on detritus and plankton suspended in the water (Abraham and Dillon 1986). Soft-shell clams spawn biannually based on water temperatures, once in spring at 10-20°C and once in fall when temperature falls to 20°C. Eggs are broadcast into the water and develop into planktonic larvae about 12 hours after fertilization; after about 4-6 weeks, larvae settle to the bottom (Abraham and Dillon 1986). Juveniles are able to move to more favorable locations, usually sandy bottoms with less than 50% silt content, before burrowing into the substrate as adults (Abraham and Dillon 1986).

While no shellfish habitat has been identified in the project areas, if they are present, any soft-shell clams within the 650 square-foot footprint of the replacement bulkhead will be lost. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. No adverse effects to soft-shell clam habitat are anticipated.

Striped Bass

Striped bass (*Morone saxatillis*) can occur in the New York Harbor from spring to fall and may be found in the Gowanus Canal. Striped bass can be found in waterbodies connected to the Harbor during spawning migrations from coastal waters into freshwater spawning grounds between May and June, and back to coastal waters post-spawn in the fall (CHG&E et al. 1999). Larvae drift with the current, but remain in low salinity river waters; juveniles begin to move into higher salinity waters as they grow. Juveniles could be found in the New York Harbor by late summer (CHG&E et al. 1999, Dunning et al. 2009). Outside of spawning periods, adult striped bass migrate along the Atlantic coast and would not likely be found in the lower East River. When they are present, they generally occur in open water, inter-pier, and semi-enclosed basin areas, especially offshore from sandy beaches or rocky shores where prey species are most abundant. Larvae feed mainly on copepods and chironomid larvae, adding larger aquatic invertebrates and small fishes to their diet as they grow (Fay et al. 1983). Larger striped bass begin to school while foraging and feed primarily on clupeids, including bay anchovy and Atlantic menhaden, but also continue to feed on invertebrates (Fay et al. 1983).

Given that striped bass are pelagic, and neither spawning nor nursery habitat occurs within Canal, the proposed project will not adversely affect this species. The proposed project will result in a minimal and temporary increase in suspended sediment and localized increases in turbidity during installation and removal of the cofferdams. These potential effects will be minimized through the use of a turbidity curtain in place for the duration of in-water construction activities associated with outfall replacement/modification. Any temporary increases in suspended sediments will dissipate upon the cessation of sediment disturbing activities. Noise from pile driving will be mitigated through the use of a vibratory hammer, will be short in duration, and will occur intermittently. Temporary and permanent loss of benthic and water column habitat will be minimal compared to similar habitat available in the area. Therefore, the proposed project will not have significant adverse effects on striped bass.

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Table 1
Essential Fish Habitat Designated Species in the Vicinity of the Project

Species	Eggs	Larvae	Juveniles	Adults
Pollock (*Pollachius virens*)			X	X
Red hake (*Urophyscis chuss*)	X	X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Windowpane flounder (*Scophthalmus aquosus*)	X	X	X	X
Atlantic sea herring (*Clupea harengus*)		X	X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Long finned squid (*Loligo pealeii*)	n/a	n/a		
Short finned squid (*Illex illecebrosus*)	n/a	n/a		
Atlantic butterfish (*Peprilus triacanthus*)		X	X	X
Atlantic mackerel (*Scomber scombrus*)			X	X
Summer flounder (*Paralichthys dentatus*)		X	X	X
Scup (*Stenotomus chrysops*)	X	X	X	X
Black sea bass (*Centropristis striata*)	n/a		X	X
Surf clam (*Spisula solidissima*)	n/a	n/a		
Ocean quahog (*Artica islandica*)	n/a	n/a		
Spiny dogfish (*Squalus acanthias*)	n/a	n/a		
King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Cobia (*Rachycentron canadum*)	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata*)			X	X
Sand tiger shark (*Carcharias taurus*)		X[(1)]		
Dusky shark (*Carcharhinus obscurus*)		X[(1)]	X[(1)]	
Sandbar shark (*Carcharhinus plumbeus*)		X[(1)]		X[(1)]

Notes: n/a – insufficient data for this life stage exists and no EFH designation has been made.

[(1)] These species do not have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger, dusky, and sandbar sharks refers to neonates and early juveniles.

Sources:

National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted at https://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/conn_li_ny/40407350.html, https://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/new_jersey/40307400.html, and http://www.nero.noaa.gov/hcd/skateefhmaps.htm

National Marine Fisheries Service EFH Mapper accessed online at http://www.habitat.noaa.gov/protection/efh/habitatmapper.html

Appendix 9-2
Vegetation and Wildlife

Table A9-1
Potential Birds in the Project Area: NYSDEC Breeding Bird Atlas (Blocks 5850C, 5750D)

Common Name	Scientific Name
Canada Goose*	*Branta canadensis*
Mute Swan	*Cygnus olor*
Mallard	*Anas platyrhynchos*
Gadwall	*Anas strepera*
American Black Duck	*Anas rubripes*
Great Egret	*Ardea alba*
Green Heron	*Butorides virescens*
Red-tailed Hawk	*Buteo jamaicensis*
Killdeer	*Charadrius vociferus*
American Kestrel	*Falco sparverius*
Peregrine Falcon[1]	*Falco peregrinus*
Rock Pigeon*	*Columba livia*
Mourning Dove	*Zenaida macroura*
Monk Parakeet	*Myiopsitta monachus*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Common Nighthawk	*Chordeiles minor*
Chimney Swift	*Chaetura pelagica*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Willow Flycatcher	*Empidonax traillii*
Eastern Wood-Pewee	*Contopus virens*
Acadian Flycatcher	*Empidonax virescens*
Eastern Phoebe	*Sayornis phoebe*
Great Crested Flycatcher	*Myiarchus crinitus*
Eastern Kingbird	*Tyrannus tyrannus*
Warbling Vireo	*Vireo gilvus*
Red-eyed Vireo	*Vireo olivaceus*
White-eyed Vireo	*Vireo griseus*
Blue Jay	*Cyanocitta cristata*
American Crow*	*Corvus brachyrhynchos*
Fish Crow*	*Corvus ossifragus*
Tree Swallow	*Tachycineta bicolor*
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapillus*
Tufted Titmouse	*Baeolophus bicolor*
Red-breasted Nuthatch	*Sitta canadensis*
White-breasted Nuthatch	*Sitta carolinensis*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Wood Thrush	*Hylocichla mustelina*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird*	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
European Starling*	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Yellow Warbler	*Dendroica petechia*
Common Yellowthroat	*Geothlypis trichas*
Eastern Towhee	*Pipilo erythrophthalmus*
Chipping Sparrow	*Spizella passerina*
Song Sparrow	*Melospiza melodia*
Field Sparrow	*Spizella pusilla*
Swamp Sparrow	*Melospiza georgiana*
Northern Cardinal	*Cardinalis cardinalis*
Red-winged Blackbird	*Agelaius phoeniceus*

Table A9-1
Potential Birds in the Project Area: NYSDEC Breeding Bird Atlas (Blocks 5850C, 5750D)

Common Grackle*	*Quiscalus quiscula*
Orchard Oriole	*Icterus spurius*
Baltimore Oriole	*Icterus galbula*
Brown-headed Cowbird*	*Molothrus ater*
House Finch*	*Carpodacus mexicanus*
American Goldfinch	*Carduelis tristis*
House Sparrow*	*Passer domesticus*

Notes: [1] New York State Listed threatened species not expected to occur due to lack of roosting habitat.

*Indicates species with the potential to occur on site

Sources: New York State Breeding Bird Atlas 2000-2005 data.

Table A9-2
NYSDEC Amphibian and Reptile Atlas

Common Name	Scientific Name
Northern Redback Salamander	*Plethodon c. cinereus*
Northern Two-lined Salamander	*Eurycea bislineata*
Eastern American Toad	*Bufo a. americanus*
Bullfrog	*Rana catesbeiana*
Common Snapping Turtle*	*Chelydra s. serpentina*
Eastern Box Turtle	*Terrapene c. carolina*
Northern Diamondback Terrapin	*Malaclemys t. terrapin*
Red-eared Slider	*Trachemys scripta elegans*
Painted Turtle*	*Chrysemys picta*
Northern Brown Snake*	*Storeria d. dekayi*
Common Garter Snake*	*Thamnophis sirtalis*
Northern Ringneck Snake	*Diadophis punctatus edwardsii*

Notes: *Indicates species with the potential to occur on site.

Sources: New York State Amphibian and Reptile Atlas 1990-1999 data.

Appendix 20-1
Groundwater Contaminants

Gowanus Canal CSO Facility
Measured Groundwater Contaminates

	Max (ug/L)	Parcel I	Parcel II	**Parcel VI**	**Parcel VII**	Gowanus Pump Station	Former Bayside Fuel Depot	Sackett	495 Sackett
BTEX (ug/L)									
Benzene	1,100.0	5200	0	190	1100	5.3	0	0.5	0
Toluene	600	2.4	490	0	600	0.047	1.5	0.5	0
Ethylbenzene	3,500	320	6300	1400	3500	0.89	3	0.5	1.5
m,p-Xylene	-	0	0	0	0	0	0	0	0
o-Xylene	-	0	0	0	0	0	0	0	0
p-Xylene	-	0	0	0	0	0	0	0	0
Total Xylene	4,700	115	5900	620	4700	2.51	3.98	0.5	2.22
Total BTEX	8,800	5555	12690	2210	8800	9.17	8.48	0	3.72
Other VOCs (ug/L)									
Acetaldehyde	-	0	0	0	0	0	0	0	0
Acetone	-	0	0	0	0	470	0	0	0
Acrolein (propenal)	-	0	0	0	0	0	0	0	0
Bromodichloromethane	-	0	0	0	0	0	0	0	0
Bromoform	-	0	0	0	0	0	0	0	0
Bromomethane	-	0	0	0	0	0	0	0	0
1,3-Butadiene	-	0	0	0	0	0	0	0	0
Butanone	-	0	0	0	0	0	0	0	0
2-Butanone	-	0	0	0	0	0	0	0	0
t-Butyl alcohol (Tertiary Butyl Alcoho	-	0	0	0	0	0	0	0	0
Carbon disulfide	0.6	0	0	0	0.61	0	0	0	0.61
Carbon tetrachloride	-	0	0	0	0	0	0	0	0
Chlorobenzene	55.0	0	0	0	55	0	0	0	0
Chloroethane	-	0	0	0	0	0	0	0	0
Chloroform	0.6	1.8	0	0.29	0.62	0	0	0	0
Chloromethane	-	0	0	0	0	0.13	0	0	0
2-Chlorotoluene	-	0	0	0	0	0	0	0	0
Cryofluorane (Freon-114)	-	0	0	0	0	0	0	0	0
Cyclohexane	110.0	0.62	0	0	110	8.3	0	0	0
n-Decane	-	0	0	0	0	0	0	0	0
Dibromochloromethane	-	0	0	0	0	0	0	0	0
1,3-Dichlorobenzene	-	0	0	0	0	0	0.17	0	0
1,4-Dichlorobenzene	-	0	0	0	0	0.23	0.17	0	0
Dichlorodifluoromethane	0.3	0	0	0.26	0	0	0	0	0
1,1-Dichloroethane	-	0	0	0	0	0.08	0	0	0
1,2-Dichloroethane	430.0	0	0	0	430	0	0	0	0
cis-1,2-Dichloroethene	490.0	0.36	0	0	490	11	5	17	2
trans-1,2-Dichloroethene	-	0	0	0	0	1.1	0.22	0	0
1,1-Dichloroethene	-	0	0	0	0	0	0	0	0
1,2-Dichloropropane	-	0	0	0	0	0	0	0	0
1,4-Dioxane	-	0	0	0	0	0	0	0	0
n-Dodecane	-	0	0	0	0	0	0	0	0
Ethanol	-	0	0	0	0	0	0	0	0
p-Ethyltoluene	-	0	0	0	0	0	0	0	0
n-Heptane	-	0	0	0	0	0	0	0	0
n-Hexane	-	0	0	0	0	0	0	0	0
2-Hexanone	40.0	0	0	0	40	0	0	0	0
Indane	-	0	0	0	0	0	0	0	0
Indene	-	0	0	0	0	0	0	0	0
Isopropyl benzene				68		3.5	0.13		
Methyl acetate				0		0	0		
Methyl ter-butyl-ether	330.0	190	110	26	330	14.1	0	15	2.6
4-Methyl-2-pentanone	21.0	0	0	0	21	0	0	0	0
Methylcyclohexane				0		21.6	0		
Methylene chloride	0.8	0.36	0	0	0.8	0	0	0	0
1-Methylnaphthalene	-	0	0	0	0	0	0	0	0
2-Methylnaphthalene	-	0	0	0	0	0	0	0	0
Naphthalene	-	0	0	0	0	0	0	0	0
Nonane	-	0	0	0	0	0	0	0	0
n-Octane	-	0	0	0	0	0	0	0	0
Pentane	-	0	0	0	0	0	0	0	0
2-Propanol (Isopropyl Alcohol)	-	0	0	0	0	0	0	0	0
Styrene	-	0	0	0	0	0	0	0	0
1,1,2,2-Tetrachlorothane	-	0	0	0	0	0	0	0	0
Tetrachloroethene (PCE)	0.3	0	0	0	0	0.095	0.26	0.33	0.24
1,2,3,4-Tetramethylbenzene	-	0	0	0	0	0	0	0	0
Thiophene	-	0	0	0	0	0	0	0	0
1,1,2-Trichloro-1,2,2-trifluoroethane	-	0	0	0	0	0	0	0	0
1,1,1-Trichloroethane	-	0	0	0	0	0	0	0	0
Trichloroethene (TCE)	120.0	0	0	0.27	120	0.059	0.27	13	0.27
Trichlorofluoromethane	8.7	0	0	8.7	0	0	0	0	0
1,2,3-Trimethylbenzene	0.2	0	0	0	0.17	0	0	0	0
1,2,4-Tricmethylbenzene	0.1	0	0	0	0.11	0	0	0	0
1,3,5-Trimethylbenzene	-	0	0	0	0	0	0	0	0
2,2,4-Trimethylpentane	-	0	0	0	0	0	0	0	0
Trichloroethene (TCE)				0.27		0.059	0.27		
Trichlorofluoromethane				8.7		0	0		
n-Undecane	-	0	0	0	0	0	0	0	0
Vinyl chloride	60.0	0	0	0	60	31.5	5.9	0	4.1

Source:
GEIS Consultants. *Final Remedial Investigation Report Fulton Municipal Works Former Manufactured Gas Plant (MGP) Site.* July 2012

Appendix 20-2
Construction Noise Measurement Results

Gowanus CSO Tanks
Spot Noise Measurement Results
October 5 to October 19, 2016 and August 4, 2017

Site	Location	Date	Time	Leq	L1	L10	L50	L90	Lmax	Lmin
1	Butler Street between Bond and Nevins	10/5/2016	18:00:18	60.4	70.1	62.9	54.7	49.7	83.5	45.3
2	Butler St and Nevins St*	10/19/2016	19:00:02	66.7	77.1	63.7	57.8	52.8	92.8	49.0
3	SW corner of 3rd Avenue and Union Street	10/5/2016	16:00:29	72.3	83.3	74.6	68.2	62.5	93.2	55.2
4	DeGraw Street Between 3rd Avenue and 4th Avenue	10/5/2016	15:00:00	65.9	74.5	67.2	64.7	61.1	83.7	53.8
5	Nevins Street bet. Sackett and Union	10/6/2016	11:00:21	62.7	69.6	63.0	55.8	52.2	91.4	49.9
6	Douglass and Bond	10/5/2016	16:59:41	74.6	75.7	64.8	58.7	52.7	103.9	48.5
7	2nd Street at the west bank of the Gowanus canal	10/5/2016	14:00:55	57.3	64.0	59.3	55.5	51.8	79.1	48.8
8	SE corner of 2nd Avenue and 9th street	10/6/2016	16:00:18	75.6	87.1	78.5	69.1	62.5	96.0	55.0
9	4th Street between Bond and Hoyt	10/5/2016	15:56:14	65.8	77.2	67.6	58.6	53.7	88.6	47.9
35P	Douglass and DeGraw Pool	8/4/2017	13:28:19	66.1	72.8	68.6	64.8	61.8	81.3	56.3

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 10

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00 PM	62.1	73.3	64.1	56.1	51.7	48.7	82.5
10/5/2016	2:00 PM	65.5	77.4	67.1	60.4	53.6	49.2	85.8
10/5/2016	3:00 PM	65.1	77.1	67.2	59.5	54.6	49.7	86.0
10/5/2016	4:00 PM	64.1	76.0	65.1	58.7	52.4	47.0	86.4
10/5/2016	5:00 PM	64.1	74.6	66.0	59.2	53.2	47.7	88.0
10/5/2016	6:00 PM	64.6	77.1	65.6	58.2	50.6	46.2	85.5
10/5/2016	7:00 PM	60.7	70.7	63.3	56.9	48.6	44.8	81.5
10/5/2016	8:00 PM	62.3	75.0	63.6	55.2	47.4	43.9	83.8
10/5/2016	9:00 PM	63.4	74.3	62.8	51.7	45.5	42.3	90.7
10/5/2016	10:00 PM	58.1	69.8	61.5	49.4	43.9	41.2	77.6
10/5/2016	11:00 PM	56.5	65.4	60.2	47.8	41.8	40.4	79.2
10/6/2016	12:00 AM	60.2	72.4	61.4	49.0	42.6	40.8	82.0
10/6/2016	1:00 AM	58.2	69.7	59.2	52.3	42.8	40.5	80.9
10/6/2016	2:00 AM	55.6	65.5	54.2	43.9	40.9	40.1	81.7
10/6/2016	3:00 AM	64.1	76.4	65.7	48.4	41.7	40.6	87.8
10/6/2016	4:00 AM	59.3	71.3	57.4	43.2	41.7	40.9	85.3
10/6/2016	5:00 AM	65.6	79.6	64.1	51.0	44.2	41.4	90.0
10/6/2016	6:00 AM	64.7	73.5	65.2	59.0	51.1	43.9	90.2
10/6/2016	7:00 AM	65.6	77.8	67.4	57.8	52.4	46.3	85.2
10/6/2016	8:00 AM	61.8	73.8	63.7	56.0	50.9	46.6	81.7
10/6/2016	9:00 AM	65.0	76.2	65.1	57.8	51.2	47.7	91.2
10/6/2016	10:00 AM	61.2	72.3	63.4	54.8	50.0	46.4	83.1
10/6/2016	11:00 AM	63.8	74.5	66.2	59.4	50.7	47.8	83.5
10/6/2016	12:00 PM	63.2	72.9	66.7	59.9	49.8	45.4	81.1

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 11

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00 PM	64.2	75.4	65.3	62.9	58.7	54.9	77.0
10/5/2016	2:00 PM	62.1	71.4	64.2	60.5	56.6	53.7	77.4
10/5/2016	3:00 PM	59.3	67.0	62.8	56.5	53.3	50.6	74.6
10/5/2016	4:00 PM	56.8	64.2	59.0	55.4	52.1	49.0	71.2
10/5/2016	5:00 PM	55.0	61.3	57.2	54.2	51.0	48.0	66.2
10/5/2016	6:00 PM	56.2	66.0	58.1	54.1	50.5	47.3	70.0
10/5/2016	7:00 PM	54.2	59.4	56.6	52.8	49.1	46.5	71.7
10/5/2016	8:00 PM	53.4	61.9	55.3	51.3	48.3	46.2	70.2
10/5/2016	9:00 PM	52.6	58.4	55.5	51.1	48.1	45.2	65.9
10/5/2016	10:00 PM	53.4	62.7	56.2	50.6	46.7	44.3	67.1
10/5/2016	11:00 PM	53.0	62.0	55.9	50.1	46.7	44.7	70.3
10/6/2016	12:00 AM	51.8	59.0	54.7	50.0	47.2	45.9	65.5
10/6/2016	1:00 AM	50.6	57.9	53.2	48.8	47.0	45.6	63.6
10/6/2016	2:00 AM	50.6	57.9	52.9	49.3	47.4	45.4	63.0
10/6/2016	3:00 AM	52.6	63.7	52.8	48.6	46.6	45.3	76.1
10/6/2016	4:00 AM	53.9	64.2	55.4	50.7	49.2	47.6	70.7
10/6/2016	5:00 AM	55.7	65.1	57.9	53.4	50.8	48.9	71.5
10/6/2016	6:00 AM	62.7	69.9	65.6	60.9	56.9	53.3	79.7
10/6/2016	7:00 AM	63.3	69.0	66.2	62.6	58.4	54.9	72.6
10/6/2016	8:00 AM	64.4	68.9	66.8	63.7	61.3	54.9	72.7
10/6/2016	9:00 AM	62.0	67.4	64.6	61.1	57.7	54.1	73.2
10/6/2016	10:00 AM	64.1	70.4	65.7	63.3	60.4	55.8	84.5
10/6/2016	11:00 AM	63.2	69.7	65.2	61.8	58.5	55.3	84.1
10/6/2016	12:00 PM	65.0	70.9	67.2	63.5	61.5	58.6	81.2

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 1

Location	**Start Time**	**dBA**						
		L_{eq}	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{min}**	**L_{max}**
Site 1	6:00:00 PM	60.40	70.10	62.90	54.70	49.70	45.30	83.50
Site 10	6:00 PM	64.6	77.1	65.6	58.2	50.6	46.2	85.5
Delta		-4.2	-7.0	-2.7	-3.5	-0.9	-0.9	-2.0

24 Hr Site 1 - Calculated from Site 10 and Delta								
Date	**Start Time**	**dBA**						
		L_{eq}	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{min}**	**L_{max}**
10/5/2016	1:00:00 PM	57.9	66.3	61.4	52.6	50.8	47.8	80.6
10/5/2016	2:00:00 PM	61.4	70.4	64.4	56.9	52.7	48.3	83.8
10/5/2016	3:00:00 PM	61.0	70.1	64.4	56.1	53.6	48.7	84.1
10/5/2016	4:00:00 PM	60.0	69.0	62.4	55.3	51.5	46.1	84.5
10/5/2016	5:00:00 PM	60.0	67.6	63.2	55.8	52.3	46.8	86.0
10/5/2016	6:00:00 PM	60.4	70.1	62.9	54.7	49.7	45.3	83.5
10/5/2016	7:00:00 PM	56.6	63.7	60.6	53.4	47.6	43.8	79.5
10/5/2016	8:00:00 PM	58.2	68.0	60.9	51.7	46.5	43.0	81.8
10/5/2016	9:00:00 PM	59.2	67.3	60.1	48.3	44.6	41.4	88.8
10/5/2016	10:00:00 PM	54.0	62.8	58.8	45.9	43.0	40.2	75.6
10/5/2016	11:00:00 PM	52.3	58.4	57.4	44.3	40.9	39.5	77.2
10/6/2016	12:00:00 AM	56.0	65.4	58.7	45.5	41.7	39.8	80.0
10/6/2016	1:00:00 AM	54.0	62.7	56.5	48.8	41.9	39.6	78.9
10/6/2016	2:00:00 AM	51.4	58.5	51.4	40.5	40.0	39.1	79.8
10/6/2016	3:00:00 AM	60.0	69.4	63.0	44.9	40.8	39.6	85.8
10/6/2016	4:00:00 AM	55.2	64.3	54.7	39.7	40.8	40.0	83.4
10/6/2016	5:00:00 AM	61.5	72.6	61.4	47.6	43.3	40.5	88.0
10/6/2016	6:00:00 AM	60.5	66.5	62.5	55.6	50.1	43.0	88.3
10/6/2016	7:00:00 AM	61.4	70.8	64.7	54.3	51.4	45.4	83.2
10/6/2016	8:00:00 AM	57.7	66.8	61.0	52.6	49.9	45.7	79.7
10/6/2016	9:00:00 AM	60.9	69.2	62.4	54.4	50.2	46.7	89.2
10/6/2016	10:00:00 AM	57.0	65.3	60.7	51.4	49.0	45.5	81.1
10/6/2016	11:00:00 AM	59.6	67.5	63.5	55.9	49.8	46.9	81.5
10/6/2016	12:00:00 PM	59.0	65.9	64.0	56.4	48.8	44.5	79.1

Gowanus CSO Tanks
23111-0005M
10/19/2016
Site 2

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 2	7:00:00 PM	66.70	77.10	63.70	57.80	52.80	49.00	92.80
Site 10	7:00 PM	60.7	70.7	63.3	56.9	48.6	44.8	81.5
Delta		6.0	6.4	0.4	0.9	4.3	4.2	11.4

24 Hr Site 2 - Calculated from Site 10 and Delta								
Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	68.0	79.8	64.5	57.0	56.0	53.0	93.9
10/5/2016	2:00:00 PM	71.5	83.8	67.6	61.3	57.9	53.4	97.2
10/5/2016	3:00:00 PM	71.1	83.6	67.6	60.5	58.8	53.9	97.4
10/5/2016	4:00:00 PM	70.1	82.5	65.6	59.7	56.7	51.3	97.8
10/5/2016	5:00:00 PM	70.1	81.0	66.4	60.2	57.5	52.0	99.3
10/5/2016	6:00:00 PM	70.5	83.5	66.0	59.1	54.9	50.5	96.8
10/5/2016	7:00:00 PM	66.7	77.1	63.7	57.8	52.8	49.0	92.8
10/5/2016	8:00:00 PM	68.3	81.4	64.0	56.1	51.6	48.1	95.2
10/5/2016	9:00:00 PM	69.3	80.7	63.2	52.7	49.8	46.6	102.1
10/5/2016	10:00:00 PM	64.1	76.2	61.9	50.3	48.2	45.4	88.9
10/5/2016	11:00:00 PM	62.4	71.8	60.6	48.7	46.1	44.6	90.6
10/6/2016	12:00:00 AM	66.2	78.9	61.8	49.9	46.9	45.0	93.3
10/6/2016	1:00:00 AM	64.1	76.1	59.6	53.2	47.1	44.7	92.2
10/6/2016	2:00:00 AM	61.6	71.9	54.6	44.9	45.2	44.3	93.1
10/6/2016	3:00:00 AM	70.1	82.8	66.1	49.3	45.9	44.8	99.1
10/6/2016	4:00:00 AM	65.3	77.8	57.8	44.1	45.9	45.1	96.7
10/6/2016	5:00:00 AM	71.6	86.0	64.5	51.9	48.5	45.7	101.4
10/6/2016	6:00:00 AM	70.6	79.9	65.7	60.0	55.3	48.1	101.6
10/6/2016	7:00:00 AM	71.6	84.2	67.9	58.7	56.6	50.5	96.5
10/6/2016	8:00:00 AM	67.8	80.2	64.2	57.0	55.1	50.8	93.1
10/6/2016	9:00:00 AM	71.0	82.6	65.6	58.8	55.4	51.9	102.5
10/6/2016	10:00:00 AM	67.1	78.8	63.9	55.7	54.2	50.6	94.4
10/6/2016	11:00:00 AM	69.8	80.9	66.7	60.3	54.9	52.1	94.8
10/6/2016	12:00:00 PM	69.2	79.4	67.1	60.8	54.0	49.7	92.5

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 3

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 3	4:00:00 PM	72.30	83.30	74.60	68.20	62.50	55.20	93.20
Site 10	4:00 PM	64.1	76.0	65.1	58.7	52.4	47.0	86.4
Delta		8.2	7.3	9.5	9.5	10.1	8.2	6.8

24 Hr Site 3 - Calculated from Site 10 and Delta								
Date	**Start Time**	**dBA**						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	70.3	80.6	73.6	65.5	61.8	56.9	89.3
10/5/2016	2:00:00 PM	73.7	84.7	76.6	69.8	63.7	57.4	92.6
10/5/2016	3:00:00 PM	73.3	84.4	76.6	69.0	64.6	57.8	92.8
10/5/2016	4:00:00 PM	72.3	83.3	74.6	68.2	62.5	55.2	93.2
10/5/2016	5:00:00 PM	72.3	81.9	75.4	68.7	63.3	55.9	94.8
10/5/2016	6:00:00 PM	72.8	84.4	75.1	67.6	60.7	54.4	92.2
10/5/2016	7:00:00 PM	68.9	78.0	72.7	66.4	58.6	52.9	88.2
10/5/2016	8:00:00 PM	70.5	82.3	73.0	64.7	57.5	52.1	90.6
10/5/2016	9:00:00 PM	71.5	81.6	72.3	61.2	55.6	50.5	97.5
10/5/2016	10:00:00 PM	66.3	77.1	71.0	58.9	54.0	49.3	84.3
10/5/2016	11:00:00 PM	64.6	72.7	69.6	57.3	51.9	48.5	86.0
10/6/2016	12:00:00 AM	68.4	79.7	70.9	58.5	52.7	48.9	88.7
10/6/2016	1:00:00 AM	66.3	77.0	68.7	61.8	52.9	48.7	87.6
10/6/2016	2:00:00 AM	63.8	72.8	63.6	53.4	51.0	48.2	88.5
10/6/2016	3:00:00 AM	72.3	83.7	75.2	57.9	51.8	48.7	94.5
10/6/2016	4:00:00 AM	67.5	78.6	66.9	52.6	51.8	49.1	92.1
10/6/2016	5:00:00 AM	73.8	86.9	73.6	60.5	54.3	49.6	96.8
10/6/2016	6:00:00 AM	72.8	80.8	74.7	68.5	61.2	52.1	97.0
10/6/2016	7:00:00 AM	73.8	85.1	76.9	67.3	62.4	54.5	91.9
10/6/2016	8:00:00 AM	70.0	81.1	73.2	65.5	61.0	54.7	88.5
10/6/2016	9:00:00 AM	73.2	83.4	74.6	67.3	61.3	55.8	97.9
10/6/2016	10:00:00 AM	69.4	79.6	72.9	64.3	60.1	54.5	89.8
10/6/2016	11:00:00 AM	72.0	81.7	75.7	68.8	60.8	56.0	90.2
10/6/2016	12:00:00 PM	71.4	80.2	76.2	69.4	59.8	53.6	87.9

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 4

Location	**Start Time**	**dBA** L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 4	3:00:00 PM	65.90	74.50	67.20	64.70	61.10	53.80	83.70
Site 10	3:00 PM	65.1	77.1	67.2	59.5	54.6	49.7	86.0
Delta		0.8	-2.6	0.0	5.2	6.6	4.2	-2.3

24 Hr Site 4 - Calculated from Site 10 and Delta								
Date	**Start Time**	**dBA** L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	62.9	70.7	64.1	61.2	58.3	52.9	80.2
10/5/2016	2:00:00 PM	66.3	74.8	67.2	65.5	60.2	53.3	83.5
10/5/2016	3:00:00 PM	65.9	74.5	67.2	64.7	61.1	53.8	83.7
10/5/2016	4:00:00 PM	64.9	73.4	65.2	63.9	59.0	51.2	84.1
10/5/2016	5:00:00 PM	64.9	71.9	66.0	64.4	59.8	51.9	85.7
10/5/2016	6:00:00 PM	65.4	74.5	65.7	63.3	57.2	50.4	83.2
10/5/2016	7:00:00 PM	61.5	68.0	63.3	62.1	55.1	48.9	79.1
10/5/2016	8:00:00 PM	63.1	72.4	63.6	60.4	53.9	48.0	81.5
10/5/2016	9:00:00 PM	64.1	71.6	62.9	56.9	52.1	46.5	88.4
10/5/2016	10:00:00 PM	58.9	67.1	61.5	54.6	50.5	45.3	75.2
10/5/2016	11:00:00 PM	57.2	62.8	60.2	53.0	48.4	44.5	76.9
10/6/2016	12:00:00 AM	61.0	69.8	61.5	54.2	49.2	44.9	79.6
10/6/2016	1:00:00 AM	58.9	67.1	59.2	57.5	49.4	44.6	78.5
10/6/2016	2:00:00 AM	56.4	62.8	54.2	49.1	47.5	44.2	79.4
10/6/2016	3:00:00 AM	64.9	73.7	65.7	53.6	48.2	44.7	85.5
10/6/2016	4:00:00 AM	60.1	68.7	57.5	48.3	48.2	45.1	83.0
10/6/2016	5:00:00 AM	66.4	76.9	64.2	56.2	50.8	45.6	87.7
10/6/2016	6:00:00 AM	65.4	70.8	65.3	64.2	57.6	48.1	87.9
10/6/2016	7:00:00 AM	66.4	75.1	67.5	63.0	58.9	50.4	82.8
10/6/2016	8:00:00 AM	62.6	71.2	63.8	61.2	57.4	50.7	79.4
10/6/2016	9:00:00 AM	65.8	73.5	65.2	63.0	57.7	51.8	88.8
10/6/2016	10:00:00 AM	62.0	69.7	63.5	60.0	56.5	50.5	80.7
10/6/2016	11:00:00 AM	64.6	71.8	66.3	64.5	57.2	52.0	81.1
10/6/2016	12:00:00 PM	64.0	70.3	66.7	65.1	56.3	49.6	78.8

Gowanus CSO Tanks
23111-0005M
10/6/2016
Site 5

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 5	11:00:00 AM	62.70	69.60	63.00	55.80	52.20	49.90	91.40
Site 10	11:00 AM	63.8	74.5	66.2	59.4	50.7	47.8	83.5
Delta		-1.1	-4.9	-3.2	-3.6	1.5	2.1	7.9

24 Hr Site 5 - Calculated from Site 10 and Delta								
Date	**Start Time**	**dBA**						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	61.0	68.5	60.9	52.5	53.2	50.8	90.5
10/5/2016	2:00:00 PM	64.4	72.5	63.9	56.8	55.1	51.3	93.7
10/5/2016	3:00:00 PM	64.0	72.3	63.9	56.0	56.1	51.7	94.0
10/5/2016	4:00:00 PM	63.0	71.2	61.9	55.2	53.9	49.1	94.4
10/5/2016	5:00:00 PM	63.1	69.7	62.7	55.7	54.7	49.8	95.9
10/5/2016	6:00:00 PM	63.5	72.2	62.4	54.6	52.1	48.3	93.4
10/5/2016	7:00:00 PM	59.6	65.8	60.0	53.3	50.1	46.8	89.4
10/5/2016	8:00:00 PM	61.2	70.2	60.3	51.6	48.9	46.0	91.7
10/5/2016	9:00:00 PM	62.3	69.4	59.6	48.2	47.0	44.4	98.7
10/5/2016	10:00:00 PM	57.0	64.9	58.3	45.8	45.4	43.2	85.5
10/5/2016	11:00:00 PM	55.4	60.6	56.9	44.2	43.3	42.5	87.1
10/6/2016	12:00:00 AM	59.1	67.6	58.2	45.4	44.1	42.8	89.9
10/6/2016	1:00:00 AM	57.1	64.8	56.0	48.7	44.3	42.6	88.8
10/6/2016	2:00:00 AM	54.5	60.6	50.9	40.4	42.4	42.1	89.7
10/6/2016	3:00:00 AM	63.0	71.5	62.5	44.8	43.2	42.6	95.7
10/6/2016	4:00:00 AM	58.2	66.5	54.2	39.6	43.2	43.0	93.3
10/6/2016	5:00:00 AM	64.5	74.7	60.9	47.5	45.7	43.5	97.9
10/6/2016	6:00:00 AM	63.6	68.6	62.0	55.5	52.6	46.0	98.2
10/6/2016	7:00:00 AM	64.5	72.9	64.2	54.2	53.9	48.4	93.1
10/6/2016	8:00:00 AM	60.8	68.9	60.5	52.5	52.4	48.7	89.7
10/6/2016	9:00:00 AM	63.9	71.3	61.9	54.3	52.7	49.7	99.1
10/6/2016	10:00:00 AM	60.1	67.5	60.2	51.3	51.5	48.5	91.0
10/6/2016	11:00:00 AM	62.7	69.6	63.0	55.8	52.2	49.9	91.4
10/6/2016	12:00:00 PM	62.1	68.1	63.5	56.3	51.3	47.5	89.0

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 6

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 6	4:00:00 PM	74.60	75.70	64.80	58.70	52.70	48.50	103.90
Site 10	4:00 PM	64.1	76.0	65.1	58.7	52.4	47.0	86.4
Delta		10.5	-0.3	-0.3	0.0	0.3	1.5	17.5

24 Hr Site 6 - Calculated from Site 10 and Delta								
Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	72.6	73.0	63.8	56.0	52.0	50.2	100.0
10/5/2016	2:00:00 PM	76.0	77.1	66.8	60.3	53.9	50.7	103.3
10/5/2016	3:00:00 PM	75.6	76.8	66.8	59.5	54.8	51.1	103.5
10/5/2016	4:00:00 PM	74.6	75.7	64.8	58.7	52.7	48.5	103.9
10/5/2016	5:00:00 PM	74.6	74.3	65.6	59.2	53.5	49.2	105.5
10/5/2016	6:00:00 PM	75.1	76.8	65.3	58.1	50.9	47.7	102.9
10/5/2016	7:00:00 PM	71.2	70.4	62.9	56.9	48.8	46.2	98.9
10/5/2016	8:00:00 PM	72.8	74.7	63.2	55.2	47.7	45.4	101.3
10/5/2016	9:00:00 PM	73.8	74.0	62.5	51.7	45.8	43.8	108.2
10/5/2016	10:00:00 PM	68.6	69.5	61.2	49.4	44.2	42.6	95.0
10/5/2016	11:00:00 PM	66.9	65.1	59.8	47.8	42.1	41.8	96.7
10/6/2016	12:00:00 AM	70.7	72.1	61.1	49.0	42.9	42.2	99.4
10/6/2016	1:00:00 AM	68.6	69.4	58.9	52.3	43.1	42.0	98.3
10/6/2016	2:00:00 AM	66.1	65.2	53.8	43.9	41.2	41.5	99.2
10/6/2016	3:00:00 AM	74.6	76.1	65.4	48.4	42.0	42.0	105.2
10/6/2016	4:00:00 AM	69.8	71.0	57.1	43.1	42.0	42.4	102.8
10/6/2016	5:00:00 AM	76.1	79.3	63.8	51.0	44.5	42.9	107.5
10/6/2016	6:00:00 AM	75.1	73.2	64.9	59.0	51.4	45.4	107.7
10/6/2016	7:00:00 AM	76.1	77.5	67.1	57.8	52.6	47.8	102.6
10/6/2016	8:00:00 AM	72.3	73.5	63.4	56.0	51.2	48.0	99.2
10/6/2016	9:00:00 AM	75.5	75.8	64.8	57.8	51.5	49.1	108.6
10/6/2016	10:00:00 AM	71.7	72.0	63.1	54.8	50.3	47.8	100.5
10/6/2016	11:00:00 AM	74.3	74.1	65.9	59.3	51.0	49.3	100.9
10/6/2016	12:00:00 PM	73.7	72.6	66.4	59.9	50.0	46.9	98.6

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 7

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 7	2:00:00 PM	57.30	64.00	59.30	55.50	51.80	48.80	79.10
Site 11	2:00 PM	62.1	71.4	64.2	60.5	56.6	53.7	77.4
Delta		-4.8	-7.4	-4.9	-5.0	-4.8	-4.9	1.7

24 Hr Site 7 - Calculated from Site 11 and Delta								
Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	59.4	68.0	60.4	57.9	53.9	50.0	78.7
10/5/2016	2:00:00 PM	57.3	64.0	59.3	55.5	51.8	48.8	79.1
10/5/2016	3:00:00 PM	54.5	59.6	57.9	51.4	48.4	45.7	76.4
10/5/2016	4:00:00 PM	52.0	56.9	54.1	50.3	47.3	44.2	73.0
10/5/2016	5:00:00 PM	50.2	53.9	52.3	49.2	46.2	43.1	68.0
10/5/2016	6:00:00 PM	51.4	58.6	53.2	49.1	45.7	42.4	71.7
10/5/2016	7:00:00 PM	49.4	52.0	51.7	47.8	44.3	41.6	73.5
10/5/2016	8:00:00 PM	48.6	54.5	50.4	46.3	43.5	41.3	71.9
10/5/2016	9:00:00 PM	47.8	51.0	50.6	46.1	43.3	40.4	67.6
10/5/2016	10:00:00 PM	48.6	55.4	51.3	45.6	41.9	39.4	68.9
10/5/2016	11:00:00 PM	48.2	54.6	51.0	45.1	41.9	39.8	72.0
10/6/2016	12:00:00 AM	47.0	51.6	49.8	45.0	42.4	41.1	67.3
10/6/2016	1:00:00 AM	45.8	50.5	48.3	43.7	42.2	40.7	65.4
10/6/2016	2:00:00 AM	45.9	50.5	48.0	44.2	42.6	40.5	64.7
10/6/2016	3:00:00 AM	47.8	56.3	47.9	43.5	41.8	40.5	77.8
10/6/2016	4:00:00 AM	49.1	56.8	50.5	45.7	44.4	42.7	72.4
10/6/2016	5:00:00 AM	50.9	57.7	53.0	48.3	46.0	44.0	73.2
10/6/2016	6:00:00 AM	57.9	62.5	60.7	55.8	52.1	48.4	81.4
10/6/2016	7:00:00 AM	58.5	61.6	61.3	57.6	53.6	50.0	74.3
10/6/2016	8:00:00 AM	59.6	61.5	61.9	58.6	56.5	50.1	74.5
10/6/2016	9:00:00 AM	57.3	60.0	59.7	56.1	52.9	49.2	74.9
10/6/2016	10:00:00 AM	59.3	63.0	60.8	58.2	55.5	51.0	86.2
10/6/2016	11:00:00 AM	58.4	62.3	60.3	56.7	53.7	50.5	85.8
10/6/2016	12:00:00 PM	60.2	63.5	62.3	58.5	56.7	53.7	83.0

Gowanus CSO Tanks
23111-0005M
10/6/2016
Site 8

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 8	4:00:00 PM	75.60	87.10	78.50	69.10	62.50	55.00	96.00
Site 11	4:00 PM	56.8	64.2	59.0	55.4	52.1	49.0	71.2
Delta		18.8	22.9	19.5	13.8	10.4	6.0	24.8

24 Hr Site 8 - Calculated from Site 11 and Delta								
Date	**Start Time**	**dBA**						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	83.0	98.3	84.8	76.7	69.1	60.9	101.8
10/5/2016	2:00:00 PM	80.9	94.3	83.7	74.3	67.0	59.7	102.1
10/5/2016	3:00:00 PM	78.2	89.9	82.3	70.2	63.6	56.5	99.4
10/5/2016	4:00:00 PM	75.6	87.1	78.5	69.1	62.5	55.0	96.0
10/5/2016	5:00:00 PM	73.8	84.2	76.7	68.0	61.4	53.9	91.0
10/5/2016	6:00:00 PM	75.0	88.9	77.6	67.9	60.9	53.3	94.7
10/5/2016	7:00:00 PM	73.0	82.3	76.1	66.6	59.5	52.4	96.5
10/5/2016	8:00:00 PM	72.2	84.8	74.8	65.1	58.7	52.1	94.9
10/5/2016	9:00:00 PM	71.4	81.2	75.0	64.9	58.4	51.2	90.6
10/5/2016	10:00:00 PM	72.2	85.6	75.7	64.4	57.1	50.3	91.9
10/5/2016	11:00:00 PM	71.8	84.9	75.4	63.9	57.1	50.6	95.1
10/6/2016	12:00:00 AM	70.7	81.9	74.2	63.8	57.6	51.9	90.3
10/6/2016	1:00:00 AM	69.4	80.8	72.7	62.5	57.4	51.6	88.4
10/6/2016	2:00:00 AM	69.5	80.7	72.4	63.0	57.8	51.4	87.7
10/6/2016	3:00:00 AM	71.4	86.5	72.3	62.3	57.0	51.3	100.9
10/6/2016	4:00:00 AM	72.8	87.0	74.9	64.5	59.6	53.5	95.4
10/6/2016	5:00:00 AM	74.5	88.0	77.4	67.1	61.2	54.8	96.2
10/6/2016	6:00:00 AM	81.5	92.8	85.1	74.6	67.3	59.3	104.5
10/6/2016	7:00:00 AM	82.2	91.9	85.7	76.4	68.8	60.9	97.3
10/6/2016	8:00:00 AM	83.2	91.8	86.3	77.4	71.7	60.9	97.5
10/6/2016	9:00:00 AM	80.9	90.3	84.1	74.9	68.1	60.1	97.9
10/6/2016	10:00:00 AM	82.9	93.3	85.2	77.0	70.7	61.8	109.2
10/6/2016	11:00:00 AM	82.0	92.5	84.7	75.5	68.9	61.3	108.8
10/6/2016	12:00:00 PM	83.8	93.8	86.7	77.3	71.9	64.5	106.0

Gowanus CSO Tanks Weekend
Spot noise Measurement Results
July 8 to July 16, 2017

Site	Location	Day	Time	Leq	L1	L10	L50	L90	Lmax	Lmin
1	Butler Street between Bond and Nevins	7/8/2017	13:02	60.1	66.8	61.4	59.0	57.4	77.2	56.4
2	Butler St and Nevins St	7/8/2017	14:03	63.5	73.5	63.6	58.0	53.7	89.7	50.1
3	SW corner of 3rd Avenue and Union Street	7/8/2017	17:03	68.5	78.7	68.8	63.5	59.9	92.8	55.6
4	DeGraw Street Between 3rd Avenue and 4th Avenue	7/8/2017	18:04	65.7	74.5	65.9	62.9	60.6	88.2	54.9
5	Nevins Street bet. Sackett and Union	7/15/2017	15:59	60.8	69.9	63.8	57.6	53.0	78.3	50.4
6	Douglass and Bond	7/8/2017	12:03	59.6	68.0	62.1	56.9	53.4	78.2	49.9
7	2nd Street at the west bank of the Gowanus Canal	7/9/2017	18:00	60.3	72.9	60.3	54.7	52.3	81.2	47.5
8	SE Corner of 2nd Avenue and 9th Street	7/16/2017	16:00	68.9	79.2	72.1	63.6	58.0	86.7	53.6
11	Whole Food Market Open Space	7/9/2017	12:00	55.2	64.9	57.8	52.0	48.3	73.0	46.2

Gowanus CSO Tanks Weekend
23111-0005P
7/15/2017
Site 9

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/15/2017	12:00 AM	60.1	71.0	59.2	55.9	54.8	54.2	83.1
7/15/2017	1:00 AM	59.1	66.2	57.5	55.3	54.3	53.5	82.7
7/15/2017	2:00 AM	57.6	63.9	57.8	55.0	54.1	53.5	82.2
7/15/2017	3:00 AM	60.4	71.3	57.4	55.3	54.6	53.8	83.7
7/15/2017	4:00 AM	60.3	71.2	60.1	56.7	54.9	54.1	83.6
7/15/2017	5:00 AM	61.9	72.7	60.7	59.3	58.8	55.9	80.1
7/15/2017	6:00 AM	60.6	72.5	60.6	58.9	55.8	54.5	76.8
7/15/2017	7:00 AM	64.6	76.8	64.4	59.1	54.8	53.8	82.5
7/15/2017	8:00 AM	65.6	77.9	66.0	60.5	56.8	54.4	85.1
7/15/2017	9:00 AM	68.0	79.4	65.4	61.6	59.8	58.5	96.7
7/15/2017	10:00 AM	65.0	74.7	66.7	62.4	60.0	58.6	85.6
7/15/2017	11:00 AM	65.9	76.3	65.9	62.7	60.8	59.0	86.6
7/15/2017	12:00 PM	63.9	70.5	65.8	62.2	60.3	58.7	79.8
7/15/2017	1:00 PM	66.0	76.9	65.2	62.3	60.5	58.8	89.4
7/15/2017	2:00 PM	65.1	74.8	64.8	61.4	58.2	55.5	91.9
7/15/2017	3:00 PM	62.3	67.2	64.3	61.6	59.1	55.6	77.2
7/15/2017	4:00 PM	63.1	67.9	64.7	62.6	60.0	56.1	77.2
7/15/2017	5:00 PM	63.2	70.8	64.9	62.2	59.6	56.0	77.7
7/15/2017	6:00 PM	62.4	70.1	64.3	60.7	57.6	56.2	80.6
7/15/2017	7:00 PM	59.8	65.4	61.7	59.4	56.0	55.2	74.3
7/15/2017	8:00 PM	60.1	66.7	61.9	59.2	55.7	54.4	76.4
7/15/2017	9:00 PM	59.6	68.6	60.9	57.5	55.2	54.2	76.2
7/15/2017	10:00 PM	59.4	66.4	60.9	58.5	55.5	54.6	74.9
7/15/2017	11:00 PM	59.2	65.8	60.8	58.3	55.7	55.1	76.7

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/16/2017	12:00 AM	58.6	64.6	60.3	57.6	55.5	54.8	75.1
7/16/2017	1:00 AM	60.1	69.0	61.5	58.1	55.1	53.9	78.3
7/16/2017	2:00 AM	60.1	70.9	62.4	57.1	54.4	53.6	78.1
7/16/2017	3:00 AM	57.0	62.0	59.8	55.8	54.1	53.2	64.8
7/16/2017	4:00 AM	58.3	61.6	60.4	58.8	54.1	53.2	68.9
7/16/2017	5:00 AM	59.4	61.1	60.2	59.2	58.7	58.2	67.4
7/16/2017	6:00 AM	60.7	70.8	60.8	59.2	55.2	54.2	79.0
7/16/2017	7:00 AM	62.7	72.8	62.7	60.2	59.1	58.5	80.0
7/16/2017	8:00 AM	63.0	71.6	63.3	61.7	60.3	58.6	78.7
7/16/2017	9:00 AM	62.8	71.8	63.3	61.7	60.2	58.2	78.7
7/16/2017	10:00 AM	62.1	67.1	63.1	61.5	59.9	58.5	77.5
7/16/2017	11:00 AM	62.2	67.0	63.3	61.4	59.8	58.3	81.5
7/16/2017	12:00 PM	62.5	70.1	63.2	61.2	59.3	57.8	81.3
7/16/2017	1:00 PM	61.6	66.5	63.0	61.2	59.5	57.8	72.7
7/16/2017	2:00 PM	63.3	67.3	64.2	62.6	60.6	54.1	84.9
7/16/2017	3:00 PM	62.8	67.4	64.5	62.3	59.7	55.4	76.7
7/16/2017	4:00 PM	66.7	76.4	65.3	63.1	60.2	55.4	88.4
7/16/2017	5:00 PM	61.3	65.7	62.9	61.0	58.8	55.3	69.4
7/16/2017	6:00 PM	63.1	72.4	63.8	61.7	59.2	54.9	81.5
7/16/2017	7:00 PM	63.4	70.6	64.4	62.2	60.6	59.8	81.1
7/16/2017	8:00 PM	62.2	66.3	63.5	61.7	60.0	58.7	77.9
7/16/2017	9:00 PM	61.6	68.5	62.4	60.2	56.2	55.2	80.4
7/16/2017	10:00 PM	61.7	67.1	62.7	61.2	60.1	59.5	74.7
7/16/2017	11:00 PM	61.7	65.0	62.6	61.8	60.3	59.7	70.8

Gowanus CSO Tanks Weekend
23111-0005P
7/8/2017
Site: 10

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	59.1	69.4	63.2	53.1	48.5	46.1	77.7
7/8/2017	1:00 AM	54.0	66.2	56.0	48.2	46.4	45.3	72.6
7/8/2017	2:00 AM	55.9	67.6	53.7	47.8	46.2	44.9	78.6
7/8/2017	3:00 AM	57.9	67.8	53.7	47.7	46.4	45.4	83.0
7/8/2017	4:00 AM	57.4	69.8	54.8	48.4	46.9	45.6	81.5
7/8/2017	5:00 AM	54.4	66.6	54.8	49.2	47.8	46.8	72.6
7/8/2017	6:00 AM	62.1	70.1	60.6	52.3	48.8	47.5	89.3
7/8/2017	7:00 AM	62.0	73.8	64.8	52.4	49.3	47.0	82.5
7/8/2017	8:00 AM	58.8	68.5	61.7	53.6	49.3	47.2	80.0
7/8/2017	9:00 AM	62.1	72.4	64.6	56.8	52.2	48.5	83.9
7/8/2017	10:00 AM	61.1	71.0	64.0	56.7	52.2	47.7	78.8
7/8/2017	11:00 AM	64.2	76.7	65.4	58.9	55.7	49.1	83.3
7/8/2017	12:00 PM	62.4	70.4	64.8	58.2	54.9	51.4	86.3
7/8/2017	1:00 PM	62.8	72.3	64.5	59.1	56.5	52.5	85.8
7/8/2017	2:00 PM	64.8	75.9	65.8	59.5	56.7	52.3	85.6
7/8/2017	3:00 PM	62.0	71.0	65.3	58.4	53.8	50.0	81.4
7/8/2017	4:00 PM	64.7	71.5	67.4	63.5	58.5	50.8	81.6
7/8/2017	5:00 PM	68.4	76.6	70.5	65.9	62.9	58.6	88.6
7/8/2017	6:00 PM	68.2	75.6	71.2	66.6	62.5	57.6	80.7
7/8/2017	7:00 PM	67.9	76.3	70.3	64.9	60.7	55.8	88.3
7/8/2017	8:00 PM	65.2	71.9	67.9	63.7	60.2	55.8	81.7
7/8/2017	9:00 PM	64.4	72.0	67.2	63.0	59.3	54.6	77.4
7/8/2017	10:00 PM	59.9	68.3	63.5	57.6	48.9	46.6	73.8
7/8/2017	11:00 PM	58.2	68.7	62.2	51.8	47.7	46.0	74.5

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	56.1	67.0	59.9	49.3	46.9	45.5	71.6
7/9/2017	1:00 AM	56.4	67.5	59.3	48.6	46.8	45.7	76.9
7/9/2017	2:00 AM	57.3	67.2	56.9	47.7	46.1	45.1	85.5
7/9/2017	3:00 AM	51.7	64.7	50.7	46.3	45.3	44.2	71.3
7/9/2017	4:00 AM	55.0	67.2	54.7	47.3	46.0	44.6	78.5
7/9/2017	5:00 AM	57.2	70.2	53.4	46.8	45.7	44.8	81.5
7/9/2017	6:00 AM	55.9	68.5	55.8	46.7	45.6	44.7	78.4
7/9/2017	7:00 AM	57.1	66.9	59.0	48.1	45.8	44.6	82.6
7/9/2017	8:00 AM	57.8	68.6	60.2	51.1	46.6	44.6	78.9
7/9/2017	9:00 AM	56.6	67.2	59.8	51.7	47.0	44.8	70.9
7/9/2017	10:00 AM	59.8	68.3	62.8	57.6	50.3	45.2	75.6
7/9/2017	11:00 AM	59.4	67.8	62.9	55.4	51.2	46.1	82.3
7/9/2017	12:00 PM	60.6	68.8	63.8	57.9	54.2	50.2	79.6
7/9/2017	1:00 PM	60.4	68.1	63.6	58.5	55.6	51.9	74.6
7/9/2017	2:00 PM	62.2	71.1	65.1	59.6	56.7	52.7	78.8
7/9/2017	3:00 PM	60.9	69.7	64.9	57.4	51.3	48.0	78.7
7/9/2017	4:00 PM	62.3	69.5	65.1	60.8	55.6	47.6	77.8
7/9/2017	5:00 PM	64.9	71.6	67.3	63.7	61.0	57.2	76.5
7/9/2017	6:00 PM	65.3	72.8	68.3	64.2	54.3	49.7	79.0
7/9/2017	7:00 PM	58.6	68.1	63.0	53.5	50.1	47.5	72.0
7/9/2017	8:00 PM	62.0	70.7	64.0	53.5	50.1	47.8	89.7
7/9/2017	9:00 PM	61.0	74.0	62.4	51.2	47.5	45.3	84.5
7/9/2017	10:00 PM	61.9	70.6	62.1	50.4	47.3	45.7	88.5
7/9/2017	11:00 PM	59.8	69.7	60.8	49.2	46.8	45.3	86.3

Gowanus CSO Tanks
23111-0005P
7/8/2017
Site: 1

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 1	**1:00 PM**	60.1	66.8	61.4	59.0	57.4	56.4	77.2
Site 10	**1:00 PM**	62.75	72.27	64.49	59.11	56.52	52.51	85.76
	Difference	2.65	5.47	3.09	0.11	-0.88	-3.89	8.56

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	56.4	63.9	60.1	53.0	49.4	50.0	69.2
7/8/2017	1:00 AM	51.3	60.7	52.9	48.1	47.3	49.2	64.0
7/8/2017	2:00 AM	53.3	62.2	50.6	47.7	47.1	48.8	70.0
7/8/2017	3:00 AM	55.2	62.3	50.7	47.6	47.3	49.2	74.5
7/8/2017	4:00 AM	54.7	64.3	51.7	48.3	47.7	49.5	72.9
7/8/2017	5:00 AM	51.7	61.2	51.7	49.0	48.7	50.7	64.1
7/8/2017	6:00 AM	59.4	64.6	57.5	52.2	49.7	51.4	80.7
7/8/2017	7:00 AM	59.4	68.3	61.7	52.3	50.1	50.9	73.9
7/8/2017	8:00 AM	56.2	63.0	58.6	53.5	50.2	51.0	71.4
7/8/2017	9:00 AM	59.5	66.9	61.6	56.7	53.1	52.4	75.3
7/8/2017	10:00 AM	58.4	65.6	60.9	56.6	53.0	51.6	70.3
7/8/2017	11:00 AM	61.5	71.2	62.3	58.8	56.6	53.0	74.7
7/8/2017	12:00 PM	59.8	64.9	61.7	58.1	55.7	55.3	77.8
7/8/2017	1:00 PM	60.1	66.8	61.4	59.0	57.4	56.4	77.2
7/8/2017	2:00 PM	62.1	70.4	62.7	59.4	57.5	56.2	77.0
7/8/2017	3:00 PM	59.4	65.5	62.3	58.3	54.6	53.9	72.8
7/8/2017	4:00 PM	62.1	66.0	64.3	63.4	59.4	54.7	73.1
7/8/2017	5:00 PM	65.8	71.1	67.4	65.8	63.8	62.5	80.1
7/8/2017	6:00 PM	65.6	70.2	68.1	66.5	63.3	61.5	72.1
7/8/2017	7:00 PM	65.3	70.8	67.2	64.8	61.6	59.7	79.7
7/8/2017	8:00 PM	62.5	66.4	64.8	63.6	61.1	59.6	73.2
7/8/2017	9:00 PM	61.8	66.5	64.1	62.9	60.1	58.4	68.9
7/8/2017	10:00 PM	57.2	62.8	60.5	57.5	49.8	50.5	65.3
7/8/2017	11:00 PM	55.5	63.3	59.1	51.6	48.6	49.9	65.9

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	53.4	61.5	56.8	49.2	47.7	49.4	63.0
7/9/2017	1:00 AM	53.7	62.0	56.2	48.5	47.7	49.6	68.3
7/9/2017	2:00 AM	54.6	61.8	53.8	47.6	47.0	49.0	76.9
7/9/2017	3:00 AM	49.1	59.2	47.6	46.2	46.2	48.1	62.7
7/9/2017	4:00 AM	52.3	61.7	51.6	47.2	46.9	48.5	69.9
7/9/2017	5:00 AM	54.6	64.8	50.3	46.7	46.5	48.6	73.0
7/9/2017	6:00 AM	53.2	63.1	52.7	46.6	46.5	48.6	69.8
7/9/2017	7:00 AM	54.5	61.5	55.9	48.0	46.6	48.5	74.1
7/9/2017	8:00 AM	55.1	63.1	57.1	51.0	47.5	48.5	70.4
7/9/2017	9:00 AM	53.9	61.8	56.7	51.6	47.9	48.7	62.4
7/9/2017	10:00 AM	57.2	62.8	59.7	57.5	51.2	49.1	67.0
7/9/2017	11:00 AM	56.8	62.4	59.8	55.3	52.1	50.0	73.8
7/9/2017	12:00 PM	57.9	63.3	60.8	57.8	55.1	54.1	71.1
7/9/2017	1:00 PM	57.8	62.6	60.5	58.4	56.5	55.8	66.0
7/9/2017	2:00 PM	59.6	65.6	62.0	59.5	57.6	56.6	70.2
7/9/2017	3:00 PM	58.3	64.2	61.8	57.3	52.2	51.9	70.1
7/9/2017	4:00 PM	59.6	64.0	62.0	60.7	56.5	51.5	69.2
7/9/2017	5:00 PM	62.2	66.1	64.2	63.6	61.9	61.1	67.9
7/9/2017	6:00 PM	62.7	67.3	65.2	64.1	55.2	53.6	70.4
7/9/2017	7:00 PM	55.9	62.6	59.9	53.4	51.0	51.4	63.4
7/9/2017	8:00 PM	59.3	65.2	60.9	53.4	51.0	51.7	81.1
7/9/2017	9:00 PM	58.4	68.6	59.3	51.1	48.4	49.2	76.0
7/9/2017	10:00 PM	59.2	65.2	59.0	50.3	48.1	49.6	80.0
7/9/2017	11:00 PM	57.2	64.2	57.7	49.0	47.7	49.2	77.7

Gowanus CSO Tanks
23111-0005M
10/5/2016
Site 9

Location	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 9	3:00:00 PM	65.80	77.20	67.60	58.60	53.70	47.90	88.60
Site 11	3:00 PM	59.3	67.0	62.8	56.5	53.3	50.6	74.6
Delta		6.5	10.2	4.8	2.1	0.5	-2.7	14.0

24 Hr Site 9 - Calculated from Site 11 and Delta								
Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
10/5/2016	1:00:00 PM	70.7	85.6	70.1	65.1	59.2	52.3	91.0
10/5/2016	2:00:00 PM	68.6	81.6	69.1	62.7	57.1	51.0	91.3
10/5/2016	3:00:00 PM	65.8	77.2	67.6	58.6	53.7	47.9	88.6
10/5/2016	4:00:00 PM	63.3	74.4	63.9	57.5	52.6	46.4	85.2
10/5/2016	5:00:00 PM	61.5	71.5	62.0	56.4	51.4	45.3	80.2
10/5/2016	6:00:00 PM	62.6	76.2	62.9	56.2	51.0	44.6	83.9
10/5/2016	7:00:00 PM	60.7	69.6	61.4	54.9	49.6	43.8	85.7
10/5/2016	8:00:00 PM	59.9	72.1	60.2	53.4	48.8	43.5	84.1
10/5/2016	9:00:00 PM	59.0	68.6	60.4	53.3	48.5	42.6	79.8
10/5/2016	10:00:00 PM	59.9	72.9	61.0	52.7	47.1	41.6	81.1
10/5/2016	11:00:00 PM	59.5	72.2	60.8	52.3	47.2	42.0	84.3
10/6/2016	12:00:00 AM	58.3	69.2	59.5	52.1	47.7	43.3	79.5
10/6/2016	1:00:00 AM	57.1	68.1	58.1	50.9	47.5	42.9	77.6
10/6/2016	2:00:00 AM	57.1	68.1	57.8	51.4	47.8	42.8	76.9
10/6/2016	3:00:00 AM	59.1	73.9	57.7	50.7	47.1	42.7	90.1
10/6/2016	4:00:00 AM	60.4	74.4	60.3	52.8	49.7	44.9	84.6
10/6/2016	5:00:00 AM	62.2	75.3	62.7	55.5	51.2	46.2	85.4
10/6/2016	6:00:00 AM	69.2	80.1	70.4	63.0	57.4	50.7	93.7
10/6/2016	7:00:00 AM	69.8	79.2	71.0	64.8	58.9	52.2	86.5
10/6/2016	8:00:00 AM	70.9	79.1	71.6	65.8	61.8	52.3	86.7
10/6/2016	9:00:00 AM	68.5	77.6	69.4	63.2	58.2	51.4	87.1
10/6/2016	10:00:00 AM	70.6	80.6	70.5	65.4	60.8	53.2	98.4
10/6/2016	11:00:00 AM	69.7	79.9	70.0	63.9	59.0	52.7	98.0
10/6/2016	12:00:00 PM	71.4	81.1	72.1	65.6	61.9	55.9	95.2

Gowanus CSO Tanks
23111-0005P
7/8/2017
Site: 2

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 2	**2:00 PM**	63.5	73.5	63.6	58.0	53.7	50.1	89.7
Site 10	**2:00 PM**	64.75	75.89	65.83	59.54	56.65	52.32	85.55
	Difference	1.25	2.39	2.23	1.54	2.95	2.22	-4.15

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	57.8	67.0	60.9	51.5	45.6	43.9	81.9
7/8/2017	1:00 AM	52.7	63.8	53.7	46.7	43.4	43.1	76.8
7/8/2017	2:00 AM	54.7	65.3	51.5	46.3	43.3	42.7	82.7
7/8/2017	3:00 AM	56.6	65.4	51.5	46.2	43.5	43.1	87.2
7/8/2017	4:00 AM	56.1	67.4	52.5	46.9	43.9	43.4	85.7
7/8/2017	5:00 AM	53.1	64.2	52.6	47.6	44.9	44.6	76.8
7/8/2017	6:00 AM	60.8	67.7	58.3	50.8	45.9	45.3	93.4
7/8/2017	7:00 AM	60.8	71.4	62.6	50.9	46.3	44.8	86.6
7/8/2017	8:00 AM	57.6	66.1	59.4	52.1	46.3	44.9	84.2
7/8/2017	9:00 AM	60.9	70.0	62.4	55.2	49.3	46.3	88.0
7/8/2017	10:00 AM	59.8	68.7	61.8	55.1	49.2	45.5	83.0
7/8/2017	11:00 AM	62.9	74.3	63.2	57.4	52.8	46.9	87.4
7/8/2017	12:00 PM	61.2	68.0	62.6	56.7	51.9	49.2	90.5
7/8/2017	1:00 PM	61.5	69.9	62.3	57.6	53.6	50.3	89.9
7/8/2017	2:00 PM	63.5	73.5	63.6	58.0	53.7	50.1	89.7
7/8/2017	3:00 PM	60.8	68.6	63.1	56.9	50.8	47.8	85.5
7/8/2017	4:00 PM	63.5	69.1	65.2	62.0	55.6	48.6	85.8
7/8/2017	5:00 PM	67.2	74.2	68.3	64.4	59.9	56.4	92.8
7/8/2017	6:00 PM	67.0	73.2	69.0	65.0	59.5	55.4	84.8
7/8/2017	7:00 PM	66.7	73.9	68.0	63.3	57.8	53.6	92.5
7/8/2017	8:00 PM	63.9	69.5	65.7	62.2	57.3	53.5	85.9
7/8/2017	9:00 PM	63.2	69.6	64.9	61.4	56.3	52.3	81.6
7/8/2017	10:00 PM	58.6	65.9	61.3	56.0	46.0	44.3	78.0
7/8/2017	11:00 PM	56.9	66.3	60.0	50.2	44.8	43.8	78.6

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	54.8	64.6	57.7	47.8	43.9	43.3	75.7
7/9/2017	1:00 AM	55.1	65.1	57.1	47.1	43.9	43.5	81.0
7/9/2017	2:00 AM	56.0	64.9	54.6	46.2	43.1	42.9	89.6
7/9/2017	3:00 AM	50.5	62.3	48.4	44.8	42.4	42.0	75.4
7/9/2017	4:00 AM	53.7	64.8	52.5	45.7	43.0	42.4	82.6
7/9/2017	5:00 AM	56.0	67.9	51.1	45.3	42.7	42.5	85.7
7/9/2017	6:00 AM	54.6	66.2	53.6	45.2	42.6	42.4	82.6
7/9/2017	7:00 AM	55.9	64.5	56.8	46.5	42.8	42.4	86.8
7/9/2017	8:00 AM	56.5	66.2	58.0	49.6	43.7	42.4	83.1
7/9/2017	9:00 AM	55.3	64.8	57.6	50.2	44.0	42.6	75.1
7/9/2017	10:00 AM	58.6	65.9	60.5	56.0	47.3	43.0	79.8
7/9/2017	11:00 AM	58.2	65.5	60.6	53.9	48.2	43.9	86.5
7/9/2017	12:00 PM	59.3	66.4	61.6	56.4	51.3	48.0	83.8
7/9/2017	1:00 PM	59.2	65.7	61.3	56.9	52.6	49.7	78.7
7/9/2017	2:00 PM	61.0	68.7	62.8	58.0	53.8	50.5	83.0
7/9/2017	3:00 PM	59.7	67.3	62.7	55.8	48.4	45.8	82.8
7/9/2017	4:00 PM	61.0	67.1	62.9	59.2	52.7	45.3	81.9
7/9/2017	5:00 PM	63.6	69.2	65.1	62.2	58.1	55.0	80.6
7/9/2017	6:00 PM	64.1	70.4	66.1	62.6	51.4	47.5	83.1
7/9/2017	7:00 PM	57.3	65.7	60.8	51.9	47.2	45.3	76.1
7/9/2017	8:00 PM	60.7	68.3	61.8	51.9	47.2	45.6	93.8
7/9/2017	9:00 PM	59.8	71.6	60.2	49.6	44.6	43.1	88.7
7/9/2017	10:00 PM	60.6	68.2	59.9	48.9	44.3	43.5	92.7
7/9/2017	11:00 PM	58.6	67.3	58.6	47.6	43.9	43.1	90.4

Gowanus CSO Tanks
23111-0005P
7/8/2017
Site: 3

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 3	**5:00 PM**	68.5	78.7	68.8	63.5	59.9	55.6	92.8
Site 10	**5:00 PM**	68.42	76.55	70.52	65.9	62.88	58.59	88.64
	Difference	-0.08	-2.15	1.72	2.4	2.98	2.99	-4.16

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	59.2	71.5	61.4	50.7	45.6	43.1	81.9
7/8/2017	1:00 AM	54.0	68.3	54.2	45.8	43.4	42.3	76.8
7/8/2017	2:00 AM	56.0	69.8	52.0	45.4	43.3	41.9	82.8
7/8/2017	3:00 AM	58.0	69.9	52.0	45.3	43.5	42.4	87.2
7/8/2017	4:00 AM	57.4	71.9	53.0	46.0	43.9	42.6	85.7
7/8/2017	5:00 AM	54.5	68.8	53.1	46.8	44.8	43.8	76.8
7/8/2017	6:00 AM	62.1	72.2	58.9	49.9	45.9	44.5	93.4
7/8/2017	7:00 AM	62.1	75.9	63.1	50.0	46.3	44.0	86.6
7/8/2017	8:00 AM	58.9	70.7	59.9	51.2	46.3	44.2	84.2
7/8/2017	9:00 AM	62.2	74.5	62.9	54.4	49.2	45.5	88.0
7/8/2017	10:00 AM	61.2	73.2	62.3	54.3	49.2	44.8	83.0
7/8/2017	11:00 AM	64.3	78.8	63.7	56.5	52.7	46.2	87.5
7/8/2017	12:00 PM	62.5	72.6	63.1	55.8	51.9	48.5	90.5
7/8/2017	1:00 PM	62.8	74.4	62.8	56.7	53.5	49.5	89.9
7/8/2017	2:00 PM	64.8	78.0	64.1	57.1	53.7	49.3	89.7
7/8/2017	3:00 PM	62.1	73.1	63.6	56.0	50.8	47.0	85.6
7/8/2017	4:00 PM	64.8	73.6	65.7	61.1	55.6	47.8	85.8
7/8/2017	5:00 PM	68.5	78.7	68.8	63.5	59.9	55.6	92.8
7/8/2017	6:00 PM	68.3	77.8	69.5	64.2	59.5	54.6	84.8
7/8/2017	7:00 PM	68.0	78.4	68.6	62.5	57.7	52.8	92.5
7/8/2017	8:00 PM	65.2	74.0	66.2	61.3	57.2	52.8	85.9
7/8/2017	9:00 PM	64.5	74.2	65.5	60.6	56.3	51.6	81.6
7/8/2017	10:00 PM	60.0	70.5	61.8	55.2	46.0	43.6	78.0
7/8/2017	11:00 PM	58.3	70.9	60.5	49.4	44.8	43.1	78.6

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	56.2	69.2	58.2	46.9	43.9	42.5	75.8
7/9/2017	1:00 AM	56.4	69.6	57.6	46.2	43.8	42.7	81.0
7/9/2017	2:00 AM	57.4	69.4	55.2	45.3	43.1	42.1	89.6
7/9/2017	3:00 AM	51.8	66.9	49.0	43.9	42.4	41.2	75.4
7/9/2017	4:00 AM	55.0	69.3	53.0	44.9	43.0	41.6	82.6
7/9/2017	5:00 AM	57.3	72.4	51.6	44.4	42.7	41.8	85.7
7/9/2017	6:00 AM	55.9	70.7	54.1	44.3	42.6	41.7	82.6
7/9/2017	7:00 AM	57.2	69.1	57.3	45.7	42.8	41.6	86.8
7/9/2017	8:00 AM	57.9	70.7	58.5	48.7	43.6	41.6	83.1
7/9/2017	9:00 AM	56.6	69.4	58.1	49.3	44.0	41.9	75.1
7/9/2017	10:00 AM	59.9	70.4	61.0	55.2	47.3	42.3	79.8
7/9/2017	11:00 AM	59.5	70.0	61.1	53.0	48.2	43.1	86.5
7/9/2017	12:00 PM	60.7	70.9	62.1	55.5	51.2	47.3	83.8
7/9/2017	1:00 PM	60.5	70.2	61.8	56.1	52.6	48.9	78.8
7/9/2017	2:00 PM	62.3	73.2	63.4	57.2	53.7	49.7	83.0
7/9/2017	3:00 PM	61.0	71.9	63.2	55.0	48.4	45.0	82.8
7/9/2017	4:00 PM	62.3	71.6	63.4	58.4	52.7	44.6	82.0
7/9/2017	5:00 PM	64.9	73.7	65.6	61.3	58.0	54.2	80.6
7/9/2017	6:00 PM	65.4	74.9	66.6	61.8	51.4	46.7	83.1
7/9/2017	7:00 PM	58.6	70.3	61.3	51.1	47.1	44.5	76.1
7/9/2017	8:00 PM	62.1	72.8	62.3	51.1	47.1	44.8	93.8
7/9/2017	9:00 PM	61.1	76.2	60.7	48.8	44.5	42.3	88.7
7/9/2017	10:00 PM	62.0	72.8	60.4	48.0	44.3	42.7	92.7
7/9/2017	11:00 PM	59.9	71.8	59.1	46.8	43.8	42.3	90.4

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Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 4	**6:00 PM**	65.7	74.5	65.9	62.9	60.6	54.9	88.2
Site 10	**6:00 PM**	68.22	75.62	71.21	66.57	62.45	57.59	80.66
	Difference	2.52	1.12	5.31	3.67	1.85	2.69	-7.54

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	56.6	68.2	57.8	49.4	46.7	43.4	85.3
7/8/2017	1:00 AM	51.4	65.1	50.7	44.5	44.5	42.6	80.1
7/8/2017	2:00 AM	53.4	66.5	48.4	44.1	44.4	42.2	86.1
7/8/2017	3:00 AM	55.4	66.7	48.4	44.0	44.6	42.7	90.6
7/8/2017	4:00 AM	54.8	68.7	49.4	44.7	45.0	42.9	89.0
7/8/2017	5:00 AM	51.9	65.5	49.5	45.5	46.0	44.1	80.2
7/8/2017	6:00 AM	59.5	69.0	55.3	48.6	47.0	44.8	96.8
7/8/2017	7:00 AM	59.5	72.6	59.5	48.7	47.4	44.3	90.0
7/8/2017	8:00 AM	56.3	67.4	56.3	50.0	47.4	44.5	87.5
7/8/2017	9:00 AM	59.6	71.3	59.3	53.1	50.4	45.8	91.4
7/8/2017	10:00 AM	58.6	69.9	58.7	53.0	50.3	45.1	86.4
7/8/2017	11:00 AM	61.7	75.5	60.1	55.2	53.9	46.5	90.8
7/8/2017	12:00 PM	59.9	69.3	59.5	54.5	53.0	48.8	93.9
7/8/2017	1:00 PM	60.2	71.2	59.2	55.4	54.7	49.8	93.3
7/8/2017	2:00 PM	62.2	74.8	60.5	55.9	54.8	49.6	93.1
7/8/2017	3:00 PM	59.5	69.8	60.0	54.7	51.9	47.3	88.9
7/8/2017	4:00 PM	62.2	70.3	62.1	59.9	56.7	48.1	89.2
7/8/2017	5:00 PM	65.9	75.4	65.2	62.2	61.0	55.9	96.2
7/8/2017	6:00 PM	65.7	74.5	65.9	62.9	60.6	54.9	88.2
7/8/2017	7:00 PM	65.4	75.2	65.0	61.2	58.9	53.1	95.8
7/8/2017	8:00 PM	62.6	70.7	62.6	60.0	58.4	53.1	89.3
7/8/2017	9:00 PM	61.9	70.9	61.9	59.3	57.4	51.9	85.0
7/8/2017	10:00 PM	57.4	67.2	58.2	53.9	47.1	43.9	81.4
7/8/2017	11:00 PM	55.7	67.6	56.9	48.1	45.9	43.4	82.0

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	53.6	65.9	54.6	45.6	45.0	42.8	79.1
7/9/2017	1:00 AM	53.8	66.3	54.0	44.9	45.0	43.0	84.4
7/9/2017	2:00 AM	54.8	66.1	51.6	44.0	44.2	42.4	93.0
7/9/2017	3:00 AM	49.2	63.6	45.4	42.7	43.5	41.5	78.8
7/9/2017	4:00 AM	52.4	66.0	49.4	43.6	44.1	41.9	86.0
7/9/2017	5:00 AM	54.7	69.1	48.1	43.1	43.8	42.1	89.1
7/9/2017	6:00 AM	53.3	67.4	50.5	43.1	43.7	42.0	85.9
7/9/2017	7:00 AM	54.6	65.8	53.7	44.4	43.9	41.9	90.2
7/9/2017	8:00 AM	55.3	67.4	54.9	47.5	44.8	41.9	86.5
7/9/2017	9:00 AM	54.0	66.1	54.5	48.0	45.1	42.2	78.5
7/9/2017	10:00 AM	57.3	67.2	57.5	53.9	48.4	42.6	83.1
7/9/2017	11:00 AM	56.9	66.7	57.5	51.7	49.3	43.4	89.9
7/9/2017	12:00 PM	58.1	67.6	58.5	54.3	52.4	47.6	87.2
7/9/2017	1:00 PM	57.9	66.9	58.3	54.8	53.7	49.2	82.1
7/9/2017	2:00 PM	59.7	69.9	59.8	55.9	54.9	50.0	86.3
7/9/2017	3:00 PM	58.4	68.6	59.6	53.7	49.5	45.3	86.2
7/9/2017	4:00 PM	59.7	68.4	59.8	57.1	53.8	44.9	85.3
7/9/2017	5:00 PM	62.3	70.5	62.0	60.0	59.2	54.5	84.0
7/9/2017	6:00 PM	62.8	71.6	63.0	60.5	52.5	47.0	86.5
7/9/2017	7:00 PM	56.0	67.0	57.7	49.8	48.3	44.8	79.5
7/9/2017	8:00 PM	59.5	69.6	58.7	49.8	48.3	45.1	97.2
7/9/2017	9:00 PM	58.5	72.9	57.1	47.5	45.7	42.6	92.1
7/9/2017	10:00 PM	59.4	69.5	56.8	46.8	45.4	43.0	96.1
7/9/2017	11:00 PM	57.3	68.6	55.5	45.5	45.0	42.6	93.8

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Site: 5

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 5	**4:00 PM**	62.8	72.4	65.3	61.2	53.8	51.4	80.4
Site 10	**4:00 PM**	64.72	71.45	67.42	63.54	58.53	50.77	81.64
	Difference	1.92	-0.95	2.12	2.34	4.73	-0.63	1.24

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	57.2	70.3	61.0	50.7	43.8	46.7	76.5
7/8/2017	1:00 AM	52.0	67.1	53.8	45.9	41.7	46.0	71.4
7/8/2017	2:00 AM	54.0	68.6	51.6	45.5	41.5	45.6	77.4
7/8/2017	3:00 AM	56.0	68.7	51.6	45.4	41.7	46.0	81.8
7/8/2017	4:00 AM	55.4	70.7	52.6	46.1	42.1	46.2	80.3
7/8/2017	5:00 AM	52.5	67.6	52.7	46.8	43.1	47.4	71.4
7/8/2017	6:00 AM	60.1	71.0	58.5	50.0	44.1	48.1	88.0
7/8/2017	7:00 AM	60.1	74.7	62.7	50.1	44.5	47.7	81.2
7/8/2017	8:00 AM	56.9	69.5	59.5	51.3	44.6	47.8	78.8
7/8/2017	9:00 AM	60.2	73.3	62.5	54.4	47.5	49.2	82.6
7/8/2017	10:00 AM	59.2	72.0	61.9	54.3	47.4	48.4	77.6
7/8/2017	11:00 AM	62.3	77.6	63.3	56.6	51.0	49.8	82.1
7/8/2017	12:00 PM	60.5	71.4	62.7	55.9	50.1	52.1	85.1
7/8/2017	1:00 PM	60.8	73.2	62.4	56.8	51.8	53.1	84.5
7/8/2017	2:00 PM	62.8	76.8	63.7	57.2	51.9	53.0	84.3
7/8/2017	3:00 PM	60.1	71.9	63.2	56.1	49.0	50.6	80.2
7/8/2017	4:00 PM	62.8	72.4	65.3	61.2	53.8	51.4	80.4
7/8/2017	5:00 PM	66.5	77.5	68.4	63.6	58.2	59.2	87.4
7/8/2017	6:00 PM	66.3	76.6	69.1	64.2	57.7	58.2	79.4
7/8/2017	7:00 PM	66.0	77.2	68.2	62.5	56.0	56.5	87.1
7/8/2017	8:00 PM	63.2	72.8	65.8	61.4	55.5	56.4	80.5
7/8/2017	9:00 PM	62.5	73.0	65.1	60.6	54.5	55.2	76.2
7/8/2017	10:00 PM	58.0	69.3	61.4	55.2	44.2	47.2	72.6
7/8/2017	11:00 PM	56.3	69.7	60.1	49.4	43.0	46.7	73.2

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	54.2	68.0	57.8	47.0	42.1	46.1	70.4
7/9/2017	1:00 AM	54.4	68.4	57.2	46.3	42.1	46.3	75.6
7/9/2017	2:00 AM	55.4	68.2	54.8	45.4	41.3	45.7	84.2
7/9/2017	3:00 AM	49.8	65.7	48.6	44.0	40.6	44.9	70.0
7/9/2017	4:00 AM	53.0	68.1	52.6	44.9	41.2	45.2	77.2
7/9/2017	5:00 AM	55.3	71.2	51.2	44.5	40.9	45.4	80.3
7/9/2017	6:00 AM	53.9	69.5	53.7	44.4	40.9	45.3	77.2
7/9/2017	7:00 AM	55.2	67.9	56.9	45.7	41.0	45.2	81.4
7/9/2017	8:00 AM	55.9	69.5	58.1	48.8	41.9	45.3	77.7
7/9/2017	9:00 AM	54.6	68.2	57.7	49.4	42.3	45.5	69.7
7/9/2017	10:00 AM	57.9	69.2	60.6	55.2	45.5	45.9	74.4
7/9/2017	11:00 AM	57.5	68.8	60.7	53.1	46.5	46.7	81.1
7/9/2017	12:00 PM	58.7	69.7	61.7	55.6	49.5	50.9	78.4
7/9/2017	1:00 PM	58.5	69.0	61.4	56.1	50.9	52.6	73.4
7/9/2017	2:00 PM	60.3	72.0	63.0	57.2	52.0	53.4	77.6
7/9/2017	3:00 PM	59.0	70.7	62.8	55.0	46.6	48.6	77.4
7/9/2017	4:00 PM	60.3	70.4	63.0	58.4	50.9	48.2	76.6
7/9/2017	5:00 PM	62.9	72.5	65.2	61.4	56.3	57.9	75.2
7/9/2017	6:00 PM	63.4	73.7	66.2	61.8	49.6	50.3	77.7
7/9/2017	7:00 PM	56.6	69.1	60.9	51.1	45.4	48.2	70.7
7/9/2017	8:00 PM	60.1	71.6	61.9	51.1	45.4	48.5	88.4
7/9/2017	9:00 PM	59.1	75.0	60.3	48.8	42.8	45.9	83.3
7/9/2017	10:00 PM	60.0	71.6	60.0	48.1	42.5	46.3	87.3
7/9/2017	11:00 PM	57.9	70.6	58.7	46.8	42.1	46.0	85.0

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Site: 6

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 6	**12:00 PM**	59.6	68.0	62.1	56.9	53.4	49.9	78.2
Site 10	**12:00 PM**	62.43	70.4	64.83	58.2	54.86	51.44	86.32
	Difference	2.83	2.4	2.73	1.3	1.46	1.54	8.12

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/8/2017	12:00 AM	56.3	67.0	60.4	51.8	47.1	44.6	69.6
7/8/2017	1:00 AM	51.1	63.8	53.2	46.9	44.9	43.8	64.5
7/8/2017	2:00 AM	53.1	65.2	51.0	46.5	44.8	43.4	70.5
7/8/2017	3:00 AM	55.1	65.4	51.0	46.4	45.0	43.8	74.9
7/8/2017	4:00 AM	54.5	67.4	52.0	47.1	45.4	44.1	73.4
7/8/2017	5:00 AM	51.5	64.2	52.1	47.9	46.3	45.2	64.5
7/8/2017	6:00 AM	59.2	67.7	57.8	51.0	47.4	46.0	81.2
7/8/2017	7:00 AM	59.2	71.4	62.1	51.1	47.8	45.5	74.4
7/8/2017	8:00 AM	56.0	66.1	58.9	52.3	47.8	45.6	71.9
7/8/2017	9:00 AM	59.3	70.0	61.9	55.5	50.8	47.0	75.8
7/8/2017	10:00 AM	58.3	68.6	61.3	55.4	50.7	46.2	70.7
7/8/2017	11:00 AM	61.3	74.3	62.7	57.6	54.2	47.6	75.2
7/8/2017	12:00 PM	59.6	68.0	62.1	56.9	53.4	49.9	78.2
7/8/2017	1:00 PM	59.9	69.9	61.8	57.8	55.1	51.0	77.6
7/8/2017	2:00 PM	61.9	73.5	63.1	58.2	55.2	50.8	77.4
7/8/2017	3:00 PM	59.2	68.6	62.6	57.1	52.3	48.5	73.3
7/8/2017	4:00 PM	61.9	69.1	64.7	62.2	57.1	49.2	73.5
7/8/2017	5:00 PM	65.6	74.2	67.8	64.6	61.4	57.1	80.5
7/8/2017	6:00 PM	65.4	73.2	68.5	65.3	61.0	56.1	72.5
7/8/2017	7:00 PM	65.1	73.9	67.5	63.6	59.2	54.3	80.2
7/8/2017	8:00 PM	62.3	69.5	65.2	62.4	58.8	54.2	73.6
7/8/2017	9:00 PM	61.6	69.6	64.4	61.7	57.8	53.0	69.3
7/8/2017	10:00 PM	57.1	65.9	60.8	56.3	47.5	45.0	65.7
7/8/2017	11:00 PM	55.4	66.3	59.5	50.5	46.3	44.5	66.3

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/9/2017	12:00 AM	53.3	64.6	57.2	48.0	45.4	44.0	63.5
7/9/2017	1:00 AM	53.5	65.1	56.6	47.3	45.3	44.2	68.7
7/9/2017	2:00 AM	54.4	64.8	54.1	46.4	44.6	43.5	77.4
7/9/2017	3:00 AM	48.9	62.3	47.9	45.0	43.9	42.7	63.1
7/9/2017	4:00 AM	52.1	64.8	52.0	46.0	44.5	43.1	70.3
7/9/2017	5:00 AM	54.4	67.8	50.6	45.5	44.2	43.2	73.4
7/9/2017	6:00 AM	53.0	66.1	53.1	45.4	44.1	43.1	70.3
7/9/2017	7:00 AM	54.3	64.5	56.3	46.8	44.3	43.1	74.5
7/9/2017	8:00 AM	55.0	66.2	57.5	49.8	45.2	43.1	70.8
7/9/2017	9:00 AM	53.7	64.8	57.1	50.4	45.5	43.3	62.8
7/9/2017	10:00 AM	57.0	65.9	60.0	56.3	48.8	43.7	67.5
7/9/2017	11:00 AM	56.6	65.4	60.1	54.1	49.7	44.5	74.2
7/9/2017	12:00 PM	57.8	66.4	61.1	56.6	52.8	48.7	71.5
7/9/2017	1:00 PM	57.6	65.7	60.8	57.2	54.1	50.4	66.5
7/9/2017	2:00 PM	59.4	68.7	62.3	58.3	55.2	51.2	70.7
7/9/2017	3:00 PM	58.1	67.3	62.2	56.1	49.9	46.4	70.5
7/9/2017	4:00 PM	59.4	67.1	62.4	59.5	54.2	46.0	69.7
7/9/2017	5:00 PM	62.0	69.2	64.6	62.4	59.6	55.7	68.3
7/9/2017	6:00 PM	62.5	70.4	65.6	62.9	52.9	48.1	70.9
7/9/2017	7:00 PM	55.7	65.7	60.3	52.2	48.6	46.0	63.8
7/9/2017	8:00 PM	59.2	68.3	61.3	52.2	48.6	46.3	81.5
7/9/2017	9:00 PM	58.2	71.6	59.7	49.9	46.1	43.7	76.4
7/9/2017	10:00 PM	59.1	68.2	59.4	49.1	45.8	44.2	80.4
7/9/2017	11:00 PM	57.0	67.3	58.1	47.9	45.4	43.8	78.1

Gowanus CSO Tanks Weekend
23111-0005P
7/9/2017
Site: 7

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 7	**6:00 PM**	60.3	72.9	60.3	54.7	52.3	47.5	81.2
Site 9	**6:00 PM**	63.06	72.44	63.8	61.72	59.24	54.93	81.47
	Difference	2.76	-0.46	3.5	7.02	6.94	7.43	0.27

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/15/2017	12:00 AM	57.4	71.4	55.7	48.9	47.9	46.7	82.8
7/15/2017	1:00 AM	56.4	66.7	54.0	48.3	47.4	46.1	82.4
7/15/2017	2:00 AM	54.9	64.3	54.3	47.9	47.2	46.0	81.9
7/15/2017	3:00 AM	57.7	71.7	53.9	48.3	47.6	46.4	83.4
7/15/2017	4:00 AM	57.5	71.7	56.6	49.7	48.0	46.7	83.3
7/15/2017	5:00 AM	59.1	73.2	57.2	52.3	51.8	48.5	79.9
7/15/2017	6:00 AM	57.9	72.9	57.1	51.9	48.8	47.0	76.5
7/15/2017	7:00 AM	61.8	77.3	60.9	52.1	47.9	46.4	82.2
7/15/2017	8:00 AM	62.8	78.3	62.5	53.5	49.9	46.9	84.8
7/15/2017	9:00 AM	65.2	79.8	61.9	54.6	52.9	51.1	96.4
7/15/2017	10:00 AM	62.2	75.2	63.2	55.4	53.0	51.1	85.3
7/15/2017	11:00 AM	63.1	76.7	62.4	55.7	53.9	51.5	86.3
7/15/2017	12:00 PM	61.2	71.0	62.3	55.1	53.3	51.2	79.5
7/15/2017	1:00 PM	63.3	77.4	61.7	55.3	53.6	51.4	89.2
7/15/2017	2:00 PM	62.4	75.3	61.3	54.3	51.2	48.1	91.6
7/15/2017	3:00 PM	59.5	67.7	60.8	54.6	52.2	48.1	77.0
7/15/2017	4:00 PM	60.3	68.3	61.2	55.6	53.0	48.7	76.9
7/15/2017	5:00 PM	60.4	71.2	61.4	55.2	52.6	48.5	77.4
7/15/2017	6:00 PM	59.6	70.5	60.8	53.7	50.6	48.8	80.3
7/15/2017	7:00 PM	57.0	65.8	58.2	52.4	49.1	47.8	74.0
7/15/2017	8:00 PM	57.3	67.1	58.4	52.2	48.7	47.0	76.1
7/15/2017	9:00 PM	56.8	69.1	57.4	50.5	48.2	46.7	75.9
7/15/2017	10:00 PM	56.6	66.9	57.4	51.5	48.6	47.1	74.6
7/15/2017	11:00 PM	56.4	66.2	57.3	51.3	48.8	47.7	76.4

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/16/2017	12:00 AM	55.8	65.1	56.8	50.6	48.6	47.4	74.8
7/16/2017	1:00 AM	57.3	69.5	58.0	51.1	48.2	46.5	78.0
7/16/2017	2:00 AM	57.4	71.4	58.9	50.0	47.5	46.1	77.8
7/16/2017	3:00 AM	54.3	62.4	56.3	48.8	47.2	45.8	64.6
7/16/2017	4:00 AM	55.5	62.1	56.9	51.8	47.2	45.8	68.6
7/16/2017	5:00 AM	56.7	61.6	56.7	52.1	51.8	50.8	67.2
7/16/2017	6:00 AM	57.9	71.3	57.3	52.1	48.2	46.7	78.7
7/16/2017	7:00 AM	59.9	73.3	59.2	53.2	52.1	51.0	79.8
7/16/2017	8:00 AM	60.2	72.1	59.8	54.7	53.4	51.2	78.4
7/16/2017	9:00 AM	60.0	72.3	59.8	54.7	53.2	50.8	78.4
7/16/2017	10:00 AM	59.4	67.5	59.6	54.4	53.0	51.1	77.3
7/16/2017	11:00 AM	59.4	67.5	59.8	54.4	52.8	50.9	81.3
7/16/2017	12:00 PM	59.7	70.6	59.7	54.2	52.4	50.3	81.0
7/16/2017	1:00 PM	58.9	66.9	59.5	54.2	52.5	50.3	72.4
7/16/2017	2:00 PM	60.6	67.8	60.7	55.5	53.7	46.7	84.6
7/16/2017	3:00 PM	60.0	67.9	61.0	55.2	52.8	48.0	76.5
7/16/2017	4:00 PM	63.9	76.8	61.8	56.0	53.2	47.9	88.2
7/16/2017	5:00 PM	58.5	66.2	59.4	54.0	51.9	47.9	69.2
7/16/2017	6:00 PM	60.3	72.9	60.3	54.7	52.3	47.5	81.2
7/16/2017	7:00 PM	60.6	71.0	60.9	55.2	53.7	52.4	80.9
7/16/2017	8:00 PM	59.5	66.8	60.0	54.7	53.1	51.3	77.7
7/16/2017	9:00 PM	58.9	69.0	58.9	53.2	49.2	47.8	80.2
7/16/2017	10:00 PM	58.9	67.6	59.2	54.1	53.2	52.0	74.5
7/16/2017	11:00 PM	59.0	65.4	59.1	54.7	53.3	52.3	70.5

Gowanus CSO Tanks
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7/16/2017
Site: 8

Location	**Start hour**	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 8	**4:00 PM**	68.9	79.2	72.1	63.6	58	53.6	86.7
Site 9	**4:00 PM**	66.66	76.37	65.27	63.06	60.15	55.36	88.42
	Difference	-2.24	-2.83	-6.83	-0.54	2.15	1.76	1.72

Date	**Start Time**	**dBA**						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/15/2017	12:00 AM	62.4	73.8	66.0	56.5	52.7	52.4	81.3
7/15/2017	1:00 AM	61.4	69.0	64.4	55.8	52.2	51.8	81.0
7/15/2017	2:00 AM	59.9	66.7	64.6	55.5	52.0	51.7	80.5
7/15/2017	3:00 AM	62.7	74.1	64.3	55.9	52.4	52.1	82.0
7/15/2017	4:00 AM	62.5	74.0	66.9	57.3	52.8	52.3	81.8
7/15/2017	5:00 AM	64.1	75.6	67.5	59.8	56.6	54.1	78.4
7/15/2017	6:00 AM	62.9	75.3	67.5	59.5	53.6	52.7	75.1
7/15/2017	7:00 AM	66.8	79.6	71.2	59.6	52.7	52.0	80.8
7/15/2017	8:00 AM	67.8	80.7	72.8	61.0	54.7	52.6	83.4
7/15/2017	9:00 AM	70.2	82.2	72.2	62.1	57.7	56.8	95.0
7/15/2017	10:00 AM	67.2	77.5	73.5	62.9	57.8	56.8	83.9
7/15/2017	11:00 AM	68.1	79.1	72.8	63.3	58.7	57.2	84.9
7/15/2017	12:00 PM	66.2	73.3	72.7	62.7	58.1	56.9	78.1
7/15/2017	1:00 PM	68.3	79.8	72.1	62.9	58.4	57.1	87.7
7/15/2017	2:00 PM	67.4	77.7	71.7	61.9	56.0	53.8	90.2
7/15/2017	3:00 PM	64.5	70.0	71.1	62.2	57.0	53.8	75.5
7/15/2017	4:00 PM	65.3	70.7	71.6	63.2	57.8	54.4	75.4
7/15/2017	5:00 PM	65.4	73.6	71.7	62.8	57.4	54.2	76.0
7/15/2017	6:00 PM	64.6	72.9	71.2	61.3	55.4	54.5	78.9
7/15/2017	7:00 PM	62.0	68.2	68.5	60.0	53.9	53.5	72.5
7/15/2017	8:00 PM	62.3	69.5	68.7	59.8	53.5	52.7	74.7
7/15/2017	9:00 PM	61.8	71.4	67.7	58.1	53.0	52.4	74.5
7/15/2017	10:00 PM	61.6	69.2	67.8	59.1	53.4	52.8	73.1
7/15/2017	11:00 PM	61.4	68.6	67.6	58.9	53.6	53.3	74.9

Date	**Start Time**	**dBA**						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/16/2017	12:00 AM	60.8	67.4	67.1	58.1	53.3	53.0	73.4
7/16/2017	1:00 AM	62.3	71.8	68.3	58.7	53.0	52.1	76.5
7/16/2017	2:00 AM	62.4	73.7	69.2	57.6	52.3	51.8	76.4
7/16/2017	3:00 AM	59.3	64.8	66.6	56.4	52.0	51.4	63.1
7/16/2017	4:00 AM	60.5	64.4	67.3	59.3	52.0	51.4	67.2
7/16/2017	5:00 AM	61.7	63.9	67.0	59.7	56.5	56.5	65.7
7/16/2017	6:00 AM	62.9	73.7	67.6	59.7	53.0	52.4	77.2
7/16/2017	7:00 AM	64.9	75.6	69.5	60.7	56.9	56.7	78.3
7/16/2017	8:00 AM	65.2	74.5	70.1	62.3	58.2	56.9	76.9
7/16/2017	9:00 AM	65.0	74.7	70.1	62.3	58.0	56.5	77.0
7/16/2017	10:00 AM	64.4	69.9	70.0	62.0	57.8	56.7	75.8
7/16/2017	11:00 AM	64.4	69.8	70.1	62.0	57.6	56.6	79.8
7/16/2017	12:00 PM	64.7	73.0	70.1	61.8	57.2	56.0	79.5
7/16/2017	1:00 PM	63.9	69.3	69.8	61.7	57.3	56.0	71.0
7/16/2017	2:00 PM	65.6	70.1	71.1	63.1	58.5	52.4	83.2
7/16/2017	3:00 PM	65.0	70.3	71.3	62.8	57.6	53.7	75.0
7/16/2017	4:00 PM	68.9	79.2	72.1	63.6	58.0	53.6	86.7
7/16/2017	5:00 PM	63.5	68.6	69.7	61.5	56.7	53.6	67.7
7/16/2017	6:00 PM	65.3	75.3	70.6	62.3	57.1	53.2	79.8
7/16/2017	7:00 PM	65.6	73.4	71.2	62.8	58.5	58.1	79.4
7/16/2017	8:00 PM	64.5	69.2	70.3	62.3	57.9	56.9	76.2
7/16/2017	9:00 PM	63.9	71.3	69.2	60.7	54.0	53.5	78.7
7/16/2017	10:00 PM	63.9	70.0	69.5	61.7	57.9	57.7	73.0
7/16/2017	11:00 PM	64.0	67.8	69.4	62.3	58.1	57.9	69.1

Gowanus CSO Tanks
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7/9/2017
Site: 11

Location	Start hour	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
Site 11	**12:00 PM**	55.2	64.9	57.8	52	48.3	46.2	73
Site 9	**12:00 PM**	62.49	70.14	63.24	61.24	59.33	57.76	81.26
	Difference	7.29	5.24	5.44	9.24	11.03	11.56	8.26

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/15/2017	12:00 AM	52.9	65.7	53.7	46.7	43.8	42.6	74.8
7/15/2017	1:00 AM	51.8	61.0	52.1	46.0	43.3	42.0	74.5
7/15/2017	2:00 AM	50.3	58.6	52.3	45.7	43.1	41.9	73.9
7/15/2017	3:00 AM	53.1	66.0	52.0	46.1	43.5	42.3	75.4
7/15/2017	4:00 AM	53.0	66.0	54.6	47.5	43.9	42.5	75.3
7/15/2017	5:00 AM	54.6	67.5	55.2	50.0	47.8	44.3	71.9
7/15/2017	6:00 AM	53.3	67.2	55.2	49.7	44.7	42.9	68.5
7/15/2017	7:00 AM	57.3	71.6	58.9	49.9	43.8	42.2	74.2
7/15/2017	8:00 AM	58.3	72.6	60.6	51.3	45.8	42.8	76.8
7/15/2017	9:00 AM	60.7	74.1	59.9	52.3	48.8	47.0	88.4
7/15/2017	10:00 AM	57.7	69.5	61.3	53.2	48.9	47.0	77.3
7/15/2017	11:00 AM	58.6	71.0	60.5	53.5	49.8	47.4	78.4
7/15/2017	12:00 PM	56.6	65.3	60.4	52.9	49.2	47.1	71.5
7/15/2017	1:00 PM	58.7	71.7	59.8	53.1	49.5	47.3	81.2
7/15/2017	2:00 PM	57.8	69.6	59.4	52.1	47.1	44.0	83.6
7/15/2017	3:00 PM	55.0	62.0	58.8	52.4	48.1	44.0	69.0
7/15/2017	4:00 PM	55.8	62.6	59.3	53.4	49.0	44.6	68.9
7/15/2017	5:00 PM	55.9	65.5	59.4	53.0	48.5	44.4	69.4
7/15/2017	6:00 PM	55.1	64.8	58.9	51.5	46.5	44.7	72.3
7/15/2017	7:00 PM	52.5	60.1	56.2	50.2	45.0	43.7	66.0
7/15/2017	8:00 PM	52.8	61.4	56.4	50.0	44.6	42.9	68.1
7/15/2017	9:00 PM	52.3	63.4	55.4	48.3	44.1	42.6	67.9
7/15/2017	10:00 PM	52.1	61.2	55.5	49.3	44.5	43.0	66.6
7/15/2017	11:00 PM	51.9	60.5	55.4	49.1	44.7	43.5	68.4

Date	Start Time	dBA						
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
7/16/2017	12:00 AM	51.3	59.4	54.9	48.4	44.5	43.2	66.9
7/16/2017	1:00 AM	52.8	63.8	56.0	48.9	44.1	42.3	70.0
7/16/2017	2:00 AM	52.9	65.7	56.9	47.8	43.4	42.0	69.8
7/16/2017	3:00 AM	49.7	56.7	54.3	46.6	43.1	41.6	56.6
7/16/2017	4:00 AM	51.0	56.4	55.0	49.5	43.1	41.6	60.6
7/16/2017	5:00 AM	52.1	55.9	54.7	49.9	47.7	46.7	59.2
7/16/2017	6:00 AM	53.4	65.6	55.3	49.9	44.1	42.6	70.7
7/16/2017	7:00 AM	55.4	67.6	57.2	51.0	48.0	46.9	71.8
7/16/2017	8:00 AM	55.7	66.4	57.9	52.5	49.3	47.1	70.4
7/16/2017	9:00 AM	55.5	66.6	57.8	52.5	49.1	46.7	70.4
7/16/2017	10:00 AM	54.9	61.8	57.7	52.2	48.9	46.9	69.3
7/16/2017	11:00 AM	54.9	61.8	57.8	52.2	48.7	46.8	73.3
7/16/2017	12:00 PM	55.2	64.9	57.8	52.0	48.3	46.2	73.0
7/16/2017	1:00 PM	54.3	61.2	57.5	52.0	48.4	46.2	64.4
7/16/2017	2:00 PM	56.0	62.1	58.8	53.3	49.6	42.6	76.6
7/16/2017	3:00 PM	55.5	62.2	59.1	53.0	48.7	43.9	68.5
7/16/2017	4:00 PM	59.4	71.1	59.8	53.8	49.1	43.8	80.2
7/16/2017	5:00 PM	54.0	60.5	57.5	51.7	47.8	43.8	61.2
7/16/2017	6:00 PM	55.8	67.2	58.4	52.5	48.2	43.4	73.2
7/16/2017	7:00 PM	56.1	65.3	59.0	53.0	49.6	48.3	72.9
7/16/2017	8:00 PM	54.9	61.1	58.0	52.5	49.0	47.1	69.7
7/16/2017	9:00 PM	54.3	63.3	57.0	50.9	45.1	43.7	72.2
7/16/2017	10:00 PM	54.4	61.9	57.2	51.9	49.1	47.9	66.5
7/16/2017	11:00 PM	54.4	59.7	57.1	52.5	49.2	48.1	62.5

Receptor Name	ID	Height (m)	Existing weekend Leq adjusted	Existing weekday Leq adjusted	CP-1 Demolition - 6 Month: Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
1	1	1.5	53.9	57.0	42.0	54.2	0.3	no	57.0	57.1	0.1	no	59.9
2	2	5.5	55.3	67.1	62.8	63.5	8.2	yes	65.8	68.5	1.4	no	70.8
3	3	1.5	56.6	69.4	54.5	58.7	2.1	no	60.2	69.5	0.1	no	71.0
4	4	5.5	54.0	62.0	40.3	54.2	0.2	no	54.7	62.0	0.0	no	62.5
5	5	1.5	54.6	60.1	59.8	60.9	6.3	yes	64.0	63.0	2.9	no	66.1
6	6	4.8	53.7	71.7	43.8	54.1	0.4	no	57.5	71.7	0.0	no	75.1
7	7	8.1	58.9	52.0	44.4	59.1	0.2	no	59.7	52.7	0.7	no	53.3
8	8	1.5	63.9	73.8	58.2	64.9	1.0	no	70.8	73.9	0.1	no	79.8
9	9	4.8	61.6	61.5	37.8	61.6	0.0	no	63.0	61.5	0.0	no	62.9
10	10	8.1	56.6	61.2	62.5	63.5	6.9	yes	66.7	64.9	3.7	yes	68.1
11	11	1.5	54.3	55.0	49.4	55.5	1.2	no	58.7	56.1	1.1	no	59.3
12S 1.OG	12S	4.8	53.8	54.0	36.5	53.9	0.1	no	55.3	54.1	0.1	no	54.6
12S 2.OG	12S	8.1	54.0	54.2	41.4	54.2	0.2	no	55.6	54.4	0.2	no	54.9
12N 1.OG	12N	1.5	48.0	52.0	31.8	48.1	0.1	no	49.5	52.0	0.0	no	52.5
12N 2.OG	12N	5	48.0	52.0	34.5	48.2	0.2	no	49.6	52.1	0.1	no	52.6
13W 1.OG	13W	8.5	57.2	54.2	30.8	57.2	0.0	no	58.6	54.2	0.0	no	54.7
13W 2.OG	13W	12	57.3	54.4	31.0	57.3	0.0	no	58.7	54.4	0.0	no	54.9
13W 3.OG	13W	1.5	56.7	54.0	32.6	56.7	0.0	no	58.1	54.0	0.0	no	54.5
13S 1.OG	13S	5	53.0	52.0	33.3	53.0	0.0	no	54.4	52.1	0.1	no	52.6
13S 2.OG	13S	8.5	53.4	52.0	37.7	53.5	0.1	no	54.9	52.2	0.2	no	52.7
13S 3.OG	13S	12	53.3	52.0	40.1	53.5	0.2	no	54.9	52.3	0.3	no	52.8
13N 1.OG	13N	1.5	55.0	53.3	34.8	55.0	0.0	no	56.4	53.4	0.1	no	53.9
13N 2.OG	13N	5	55.7	54.1	37.9	55.8	0.1	no	57.2	54.2	0.1	no	54.7
13N 3.OG	13N	8.5	55.5	53.9	42.5	55.7	0.2	no	57.1	54.2	0.3	no	54.7
14S 1.OG	14S	12	54.7	54.9	33.9	54.7	0.0	no	56.1	54.9	0.0	no	55.4
14S 2.OG	14S	1.5	54.7	54.9	35.3	54.7	0.0	no	56.1	54.9	0.0	no	55.4
14S 3.OG	14S	5	54.2	54.3	37.6	54.3	0.1	no	55.7	54.4	0.1	no	54.9
14S 4.OG	14S	8.5	53.7	53.8	41.0	53.9	0.2	no	55.3	54.0	0.2	no	54.5
14N 1.OG	14N	12	48.0	52.0	32.8	48.1	0.1	no	49.5	52.1	0.1	no	52.6
14N 2.OG	14N	1.5	48.0	52.0	33.4	48.1	0.1	no	49.5	52.1	0.1	no	52.6
14N 3.OG	14N	6	48.0	52.0	37.1	48.3	0.3	no	49.7	52.1	0.1	no	52.6
14N 4.OG	14N	1.5	48.0	52.0	39.3	48.5	0.5	no	49.9	52.2	0.2	no	52.7
15N 1.OG	15N	6	55.6	54.8	32.9	55.6	0.0	no	57.0	54.8	0.0	no	55.3
15N 2.OG	15N	1.5	56.0	55.2	34.4	56.0	0.0	no	57.4	55.2	0.0	no	55.7
15N 3.OG	15N	5.7	55.6	54.8	36.8	55.7	0.1	no	57.1	54.9	0.1	no	55.4
15N 4.OG	15N	9.9	55.1	54.3	42.1	55.3	0.2	no	56.7	54.6	0.3	no	55.1
15E 1.OG	15E	14.1	57.1	54.4	40.1	57.2	0.1	no	58.6	54.6	0.2	no	55.1
15E 2.OG	15E	18.3	56.9	54.5	46.5	57.3	0.4	no	58.7	55.1	0.6	no	55.6
15E 3.OG	15E	22.5	56.3	54.1	49.7	57.2	0.9	no	58.6	55.4	1.3	no	55.9
15E 4.OG	15E	26.7	55.6	53.6	50.5	56.8	1.2	no	58.2	55.3	1.7	no	55.8
16N 1.OG	16N	1.5	48.0	57.2	33.9	48.2	0.2	no	51.6	57.2	0.0	no	48.6
16N 2.OG	16N	5.7	48.0	57.9	44.4	49.6	1.6	no	53.0	58.1	0.2	no	49.5
16S 1.OG	16S	9.9	48.0	52.0	34.4	48.2	0.2	no	51.6	52.1	0.1	no	43.5
16S 2.OG	16S	14.1	48.0	52.2	41.8	48.9	0.9	no	52.3	52.6	0.4	no	44.0
17S 1.OG	17S	18.3	48.0	62.1	40.8	48.8	0.8	no	52.2	62.1	0.0	no	53.5
17S 2.OG	17S	22.5	48.0	62.5	45.4	49.9	1.9	no	53.3	62.6	0.1	no	54.0
17S 3.OG	17S	26.7	48.0	62.1	45.7	50.0	2.0	no	53.4	62.2	0.1	no	53.6
17S 4.OG	17S	1.5	48.0	61.5	45.8	50.0	2.0	no	53.4	61.6	0.1	no	53.0
17S 5.OG	17S	5.7	48.0	60.9	45.9	50.1	2.1	no	53.5	61.0	0.1	no	52.4
17S 6.OG	17S	9.9	48.0	60.0	46.0	50.1	2.1	no	53.5	60.2	0.2	no	51.6
17S 7.OG	17S	14.1	48.0	59.4	46.1	50.2	2.2	no	53.6	59.6	0.2	no	51.0
17E 1.OG	17E	18.3	48.0	52.0	41.4	48.9	0.9	no	52.3	52.4	0.4	no	43.8
17E 2.OG	17E	22.5	48.0	52.0	46.3	50.2	2.2	no	53.6	53.0	1.0	no	44.4
17E 3.OG	17E	26.7	48.0	52.9	49.5	51.8	3.8	no	55.2	54.5	1.6	no	45.9
17E 4.OG	17E	1.5	48.0	53.6	50.2	52.2	4.2	no	55.6	55.2	1.6	no	46.6
17E 5.OG	17E	5.7	48.0	54.0	50.8	52.6	4.6	no	56.0	55.7	1.7	no	47.1
17E 6.OG	17E	9.9	48.0	54.5	51.0	52.8	4.8	no	56.2	56.1	1.6	no	47.5
17E 7.OG	17E	14.1	48.0	55.0	51.0	52.8	4.8	no	56.2	56.5	1.5	no	47.9
17W 1.OG	17W	18.3	48.0	52.0	31.0	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17W 2.OG	17W	22.5	48.0	52.0	31.1	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17W 3.OG	17W	26.7	48.0	52.0	31.2	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17W 4.OG	17W	1.5	48.0	52.0	31.2	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17W 5.OG	17W	4.6	48.0	52.0	31.2	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17W 6.OG	17W	1.5	48.0	52.0	31.2	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17W 7.OG	17W	4.6	48.0	52.0	31.7	48.1	0.1	no	51.5	52.0	0.0	no	43.4
17N 1.OG	17N	1.5	48.0	53.0	33.0	48.1	0.1	no	51.5	53.0	0.0	no	44.4
17N 2.OG	17N	1.5	48.0	55.1	36.2	48.3	0.3	no	51.7	55.2	0.1	no	46.6
17N 3.OG	17N	1.5	48.0	55.5	42.6	49.1	1.1	no	52.5	55.7	0.2	no	47.1
17N 4.OG	17N	1.5	48.0	55.1	43.2	49.2	1.2	no	52.6	55.4	0.3	no	46.8
17N 5.OG	17N	1.5	48.0	54.9	43.5	49.3	1.3	no	52.7	55.2	0.3	no	46.6
17N 6.OG	17N	4.63	48.0	54.6	43.7	49.4	1.4	no	52.8	54.9	0.3	no	46.3
17N 7.OG	17N	7.76	48.0	54.5	44.0	49.5	1.5	no	52.9	54.9	0.4	no	46.3
18S 1.OG	18S	1.5	58.8	52.0	33.0	58.8	0.0	no	59.4	52.1	0.1	no	54.2
18S 2.OG	18S	4.63	59.0	52.0	34.4	59.0	0.0	no	59.6	52.1	0.1	no	54.2
18N 1.OG	18N	7.76	48.0	52.0	32.7	48.1	0.1	no	48.7	52.1	0.1	no	54.2
18N 2.OG	18N	1.5	48.0	52.0	33.7	48.2	0.2	no	48.8	52.1	0.1	no	54.2
19S	19S	4.63	56.1	55.9	38.1	56.2	0.1	no	57.6	56.0	0.1	no	56.5
19W	19W	7.76	49.2	52.0	36.9	49.4	0.2	no	50.8	52.1	0.1	no	52.6
19N	19N	1.5	48.0	52.0	36.6	48.3	0.3	no	49.7	52.1	0.1	no	52.6
19E	19E	4.5	48.0	52.0	37.0	48.3	0.3	no	49.7	52.1	0.1	no	52.6
20S 1.OG	20S	7.5	51.6	54.9	44.2	52.3	0.7	no	55.1	55.3	0.4	no	59.0
20S 2.OG	20S	10.5	51.7	55.0	48.5	53.4	1.7	no	56.2	55.9	0.9	no	59.6
20S 3.OG	20S	1.5	51.1	54.5	50.5	53.8	2.7	no	56.6	56.0	1.5	no	59.7
20E 1.OG	20E	4.5	48.0	52.0	39.8	48.6	0.6	no	51.4	52.3	0.3	no	56.0
20E 2.OG	20E	7.5	48.0	52.0	44.3	49.5	1.5	no	52.3	52.7	0.7	no	56.4
20E 3.OG	20E	10.5	48.0	52.0	50.6	52.5	4.5	no	55.3	54.4	2.4	no	58.1
20W 1.OG	20W	1.5	50.7	54.9	34.6	50.8	0.1	no	53.6	54.9	0.0	no	58.6
20W 2.OG	20W	4.5	50.5	54.7	35.1	50.6	0.1	no	53.4	54.7	0.0	no	58.4
20W 3.OG	20W	7.5	49.9	54.1	37.8	50.2	0.3	no	53.0	54.2	0.1	no	57.9
21E 1.OG	21E	10.5	48.2	52.2	41.4	49.0	0.8	no	51.8	52.5	0.3	no	56.2
21E 2.OG	21E	1.5	49.1	53.2	44.0	50.3	1.2	no	53.1	53.7	0.5	no	57.4
21E 3.OG	21E	4	49.3	53.2	47.5	51.5	2.2	no	54.3	54.2	1.0	no	57.9
21E 4.OG	21E	6.5	49.1	53.1	51.3	53.3	4.2	no	56.1	55.3	2.2	no	59.0
21S 1.OG	21S	9	48.0	52.0	39.0	48.5	0.5	no	51.3	52.2	0.2	no	55.9
21S 2.OG	21S	11.5	48.0	52.0	41.9	49.0	1.0	no	51.8	52.4	0.4	no	56.1
21S 3.OG	21S	14	48.0	52.0	45.8	50.0	2.0	no	52.8	52.9	0.9	no	56.6
21S 4.OG	21S	16.5	48.0	52.0	51.2	52.9	4.9	no	55.7	54.6	2.6	no	58.3
21N 1.OG	21N	19	48.0	52.0	33.1	48.1	0.1	no	50.9	52.1	0.1	no	55.8
21N 2.OG	21N	21.5	48.0	52.0	33.2	48.1	0.1	no	50.9	52.1	0.1	no	55.8
21N 3.OG	21N	1.5	48.0	52.0	33.5	48.2	0.2	no	51.0	52.1	0.1	no	55.8
21N 4.OG	21N	4	48.0	52.0	37.1	48.3	0.3	no	51.1	52.1	0.1	no	55.8
22E 1.OG	22E	6.5	48.0	62.3	38.7	48.5	0.5	no	51.9	62.3	0.0	no	53.7
22E 2.OG	22E	9	48.0	63.0	41.0	48.8	0.8	no	52.2	63.0	0.0	no	54.4
22E 3.OG	22E	11.5	48.0	63.1	44.1	49.5	1.5	no	52.9	63.2	0.1	no	54.6
22E 4.OG	22E	14	48.0	62.9	48.6	51.3	3.3	no	54.7	63.1	0.2	no	54.5
22E 5.OG	22E	16.5	48.0	62.7	53.5	54.6	6.6	yes	58.0	63.2	0.5	no	54.6
22E 6.OG	22E	19	48.0	62.3	54.3	55.2	7.2	yes	58.6	62.9	0.6	no	54.3
22E 7.OG	22E	21.5	48.0	62.1	54.4	55.3	7.3	yes	58.7	62.8	0.7	no	54.2
22E 8.OG	22E	1.5	48.0	61.8	54.5	55.4	7.4	yes	58.8	62.5	0.7	no	53.9
22E 9.OG	22E	4	48.0	61.6	54.5	55.4	7.4	yes	58.8	62.4	0.8	no	53.8
22S 1.OG	22S	6.5	48.0	59.8	41.3	48.8	0.8	no	52.2	59.9	0.1	no	51.3
22S 2.OG	22S	9	48.0	60.5	44.4	49.6	1.6	no	53.0	60.6	0.1	no	52.0
22S 3.OG	22S	11.5	48.0	60.7	45.8	50.0	2.0	no	53.4	60.8	0.1	no	52.2
22S 4.OG	22S	14	48.0	60.7	48.6	51.3	3.3	no	54.7	61.0	0.3	no	52.4
22S 5.OG	22S	16.5	48.0	60.5	50.7	52.6	4.6	no	56.0	60.9	0.4	no	52.3
22S 6.OG	22S	19	48.0	60.3	52.3	53.7	5.7	yes	57.1	60.9	0.6	no	52.3
22S 7.OG	22S	21.5	48.0	60.2	53.2	54.3	6.3	yes	57.7	61.0	0.8	no	52.4
22S 8.OG	22S	1.5	48.0	60.1	53.2	54.3	6.3	yes	57.7	60.9	0.8	no	52.3
22S 9.OG	22S	4	48.0	59.8	53.2	54.3	6.3	yes	57.7	60.7	0.9	no	52.1
22N 1.OG	22N	6.5	48.0	52.6	35.6	48.2	0.2	no	51.6	52.7	0.1	no	44.1
22N 2.OG	22N	9	48.0	54.0	36.7	48.3	0.3	no	51.7	54.1	0.1	no	45.5
22N 3.OG	22N	11.5	48.0	55.0	38.3	48.4	0.4	no	51.8	55.1	0.1	no	46.5
22N 4.OG	22N	14	48.0	55.5	41.0	48.8	0.8	no	52.2	55.7	0.2	no	47.1
22N 5.OG	22N	16.5	48.0	55.8	44.6	49.6	1.6	no	53.0	56.1	0.3	no	47.5
22N 6.OG	22N	19	48.0	55.9	46.4	50.3	2.3	no	53.7	56.4	0.5	no	47.8
22N 7.OG	22N	21.5	48.0	55.7	46.9	50.5	2.5	no	53.9	56.2	0.5	no	47.6
22N 8.OG	22N	1.5	48.0	55.6	47.5	50.8	2.8	no	54.2	56.2	0.6	no	47.6
22N 9.OG	22N	5	48.0	55.7	48.3	51.2	3.2	no	54.6	56.4	0.7	no	47.8
22W 1.OG	22W	8.5	48.0	52.0	33.4	48.1	0.1	no	51.5	52.1	0.1	no	43.5
22W 2.OG	22W	1.5	48.0	52.0	33.8	48.2	0.2	no	51.6	52.1	0.1	no	43.5

Receptor Name	CP-2 SOE - 13 Months: Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment	CP-2 Excavation and Remediation - 10 months: Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
1	44.0	54.3	0.4	no	57.1	57.2	0.2	no	60.0	46.2	54.6	0.7	no	57.4	57.3	0.3	no	60.1
2	64.8	65.3	10.0	yes	67.6	69.1	2.0	no	71.4	69.2	69.4	14.1	yes	71.7	71.3	4.2	yes	73.6
3	56.3	59.5	2.9	no	61.0	69.6	0.2	no	71.1	61.5	62.7	6.1	yes	64.2	70.0	0.7	no	71.6
4	40.7	54.2	0.2	no	54.7	62.0	0.0	no	62.5	46.7	54.7	0.7	no	55.2	62.1	0.1	no	62.6
5	61.1	62.0	7.4	yes	65.1	63.6	3.5	no	66.7	67.7	67.9	13.3	yes	71.0	68.4	8.3	yes	71.5
6	48.6	54.9	1.2	no	58.3	71.7	0.0	no	75.1	54.5	57.1	3.4	no	60.5	71.8	0.1	no	75.2
7	46.3	59.1	0.2	no	59.7	53.0	1.0	no	53.6	51.2	59.6	0.7	no	60.2	54.6	2.6	no	55.2
8	59.9	65.4	1.5	no	71.3	74.0	0.2	no	79.9	65.3	67.7	3.8	yes	73.6	74.4	0.6	no	80.3
9	40.1	61.6	0.0	no	63.0	61.5	0.0	no	62.9	42.4	61.7	0.1	no	63.1	61.6	0.1	no	63.0
10	69.2	69.4	12.8	yes	72.6	69.8	8.6	yes	73.0	68.0	68.3	11.7	yes	71.5	68.8	7.6	yes	72.0
11	51.2	56.0	1.7	no	59.2	56.5	1.5	no	59.7	57.4	59.1	4.8	no	62.3	59.4	4.4	no	62.6
12S 1.OG	37.6	53.9	0.1	no	55.3	54.1	0.1	no	54.6	42.4	54.1	0.3	no	55.5	54.3	0.3	no	54.8
12S 2.OG	41.2	54.2	0.2	no	55.6	54.4	0.2	no	54.9	47.3	54.8	0.8	no	56.2	55.0	0.8	no	55.5
12N 1.OG	34.1	48.2	0.2	no	49.6	52.1	0.1	no	52.6	36.1	48.3	0.3	no	49.7	52.1	0.1	no	52.6
12N 2.OG	36.9	48.3	0.3	no	49.7	52.1	0.1	no	52.6	38.5	48.5	0.5	no	49.9	52.2	0.2	no	52.7
13W 1.OG	33.0	57.2	0.0	no	58.6	54.2	0.0	no	54.7	35.7	57.2	0.0	no	58.6	54.3	0.1	no	54.8
13W 2.OG	33.2	57.3	0.0	no	58.7	54.4	0.0	no	54.9	36.0	57.3	0.0	no	58.7	54.5	0.1	no	55.0
13W 3.OG	34.4	56.7	0.0	no	58.1	54.0	0.0	no	54.5	37.4	56.8	0.1	no	58.2	54.1	0.1	no	54.6
13S 1.OG	34.8	53.1	0.1	no	54.5	52.1	0.1	no	52.6	38.0	53.1	0.1	no	54.5	52.2	0.2	no	52.7
13S 2.OG	37.4	53.5	0.1	no	54.9	52.1	0.1	no	52.6	42.5	53.7	0.3	no	55.1	52.5	0.5	no	53.0
13S 3.OG	38.9	53.5	0.2	no	54.9	52.2	0.2	no	52.7	45.6	54.0	0.7	no	55.4	52.9	0.9	no	53.4
13N 1.OG	37.0	55.1	0.1	no	56.5	53.4	0.1	no	53.9	39.5	55.1	0.1	no	56.5	53.5	0.2	no	54.0
13N 2.OG	39.9	55.8	0.1	no	57.2	54.3	0.2	no	54.8	42.2	55.9	0.2	no	57.3	54.4	0.3	no	54.9
13N 3.OG	42.5	55.7	0.2	no	57.1	54.2	0.3	no	54.7	45.7	55.9	0.4	no	57.3	54.5	0.6	no	55.0
14S 1.OG	36.7	54.8	0.1	no	56.2	55.0	0.1	no	55.5	42.0	54.9	0.2	no	56.3	55.1	0.2	no	55.6
14S 2.OG	37.8	54.8	0.1	no	56.2	55.0	0.1	no	55.5	44.1	55.1	0.4	no	56.5	55.2	0.3	no	55.7
14S 3.OG	39.1	54.3	0.1	no	55.7	54.4	0.1	no	54.9	45.6	54.8	0.6	no	56.2	54.8	0.5	no	55.3
14S 4.OG	41.1	53.9	0.2	no	55.3	54.0	0.2	no	54.5	47.5	54.6	0.9	no	56.0	54.7	0.9	no	55.2
14N 1.OG	35.1	48.2	0.2	no	49.6	52.1	0.1	no	52.6	37.4	48.4	0.4	no	49.8	52.1	0.1	no	52.6
14N 2.OG	35.9	48.3	0.3	no	49.7	52.1	0.1	no	52.6	38.0	48.4	0.4	no	49.8	52.2	0.2	no	52.7
14N 3.OG	40.0	48.6	0.6	no	50.0	52.3	0.3	no	52.8	40.8	48.8	0.8	no	50.2	52.3	0.3	no	52.8
14N 4.OG	42.1	49.0	1.0	no	50.4	52.4	0.4	no	52.9	42.7	49.1	1.1	no	50.5	52.5	0.5	no	53.0
15N 1.OG	35.3	55.6	0.0	no	57.0	54.8	0.0	no	55.3	37.4	55.7	0.1	no	57.1	54.9	0.1	no	55.4
15N 2.OG	37.2	56.1	0.1	no	57.5	55.3	0.1	no	55.8	38.8	56.1	0.1	no	57.5	55.3	0.1	no	55.8
15N 3.OG	39.9	55.7	0.1	no	57.1	54.9	0.1	no	55.4	41.6	55.8	0.2	no	57.2	55.0	0.2	no	55.5
15N 4.OG	42.5	55.3	0.2	no	56.7	54.6	0.3	no	55.1	46.4	55.6	0.5	no	57.0	55.0	0.7	no	55.5
15E 1.OG	40.8	57.2	0.1	no	58.6	54.6	0.2	no	55.1	45.4	57.4	0.3	no	58.8	54.9	0.5	no	55.4
15E 2.OG	46.0	57.2	0.3	no	58.6	55.1	0.6	no	55.6	51.6	58.0	1.1	no	59.4	56.3	1.8	no	56.8
15E 3.OG	48.4	57.0	0.7	no	58.4	55.1	1.0	no	55.6	53.4	58.1	1.8	no	59.5	56.8	2.7	no	57.3
15E 4.OG	49.2	56.5	0.9	no	57.9	54.9	1.3	no	55.4	54.6	58.1	2.5	no	59.5	57.1	3.5	no	57.6
16N 1.OG	37.3	48.4	0.4	no	51.8	57.2	0.0	no	48.6	40.8	48.8	0.8	no	52.2	57.3	0.1	no	48.7
16N 2.OG	48.9	51.5	3.5	no	54.9	58.4	0.5	no	49.8	52.7	54.0	6.0	yes	57.4	59.0	1.1	no	50.4
16S 1.OG	36.0	48.3	0.3	no	51.7	52.1	0.1	no	43.5	39.4	48.6	0.6	no	52.0	52.2	0.2	no	43.6
16S 2.OG	40.3	48.7	0.7	no	52.1	52.5	0.3	no	43.9	45.4	49.9	1.9	no	53.3	53.0	0.8	no	44.4
17S 1.OG	34.3	48.2	0.2	no	51.6	62.1	0.0	no	53.5	49.7	51.9	3.9	no	55.3	62.3	0.2	no	53.7
17S 2.OG	34.9	48.2	0.2	no	51.6	62.5	0.0	no	53.9	52.9	54.1	6.1	yes	57.5	63.0	0.5	no	54.4
17S 3.OG	36.5	48.3	0.3	no	51.7	62.1	0.0	no	53.5	53.0	54.2	6.2	yes	57.6	62.6	0.5	no	54.0
17S 4.OG	37.1	48.3	0.3	no	51.7	61.5	0.0	no	52.9	54.4	55.3	7.3	yes	58.7	62.3	0.8	no	53.7
17S 5.OG	37.5	48.4	0.4	no	51.8	60.9	0.0	no	52.3	54.7	55.5	7.5	yes	58.9	61.8	0.9	no	53.2
17S 6.OG	38.5	48.5	0.5	no	51.9	60.0	0.0	no	51.4	54.7	55.5	7.5	yes	58.9	61.1	1.1	no	52.5
17S 7.OG	41.4	48.9	0.9	no	52.3	59.5	0.1	no	50.9	55.2	56.0	8.0	yes	59.4	60.8	1.4	no	52.2
17E 1.OG	42.7	49.1	1.1	no	52.5	52.5	0.5	no	43.9	47.0	50.5	2.5	no	53.9	53.2	1.2	no	44.6
17E 2.OG	46.3	50.2	2.2	no	53.6	53.0	1.0	no	44.4	51.2	52.9	4.9	no	56.3	54.6	2.6	no	46.0
17E 3.OG	49.1	51.6	3.6	no	55.0	54.4	1.5	no	45.8	53.0	54.2	6.2	yes	57.6	56.0	3.1	no	47.4
17E 4.OG	49.7	51.9	3.9	no	55.3	55.1	1.5	no	46.5	56.0	56.6	8.6	yes	60.0	58.0	4.4	no	49.4
17E 5.OG	49.9	52.1	4.1	no	55.5	55.4	1.4	no	46.8	57.1	57.6	9.6	yes	61.0	58.8	4.8	no	50.2
17E 6.OG	49.9	52.1	4.1	no	55.5	55.8	1.3	no	47.2	57.4	57.9	9.9	yes	61.3	59.2	4.7	no	50.6
17E 7.OG	50.1	52.2	4.2	no	55.6	56.2	1.2	no	47.6	57.6	58.1	10.1	yes	61.5	59.5	4.5	no	50.9
17W 1.OG	33.1	48.1	0.1	no	51.5	52.1	0.1	no	43.5	36.2	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17W 2.OG	33.1	48.1	0.1	no	51.5	52.1	0.1	no	43.5	36.4	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17W 3.OG	33.2	48.1	0.1	no	51.5	52.1	0.1	no	43.5	36.5	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17W 4.OG	33.2	48.1	0.1	no	51.5	52.1	0.1	no	43.5	36.6	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17W 5.OG	33.2	48.1	0.1	no	51.5	52.1	0.1	no	43.5	36.5	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17W 6.OG	33.2	48.1	0.1	no	51.5	52.1	0.1	no	43.5	36.5	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17W 7.OG	33.8	48.2	0.2	no	51.6	52.1	0.1	no	43.5	37.0	48.3	0.3	no	51.7	52.1	0.1	no	43.5
17N 1.OG	37.8	48.4	0.4	no	51.8	53.1	0.1	no	44.5	39.8	48.6	0.6	no	52.0	53.2	0.2	no	44.6
17N 2.OG	42.6	49.1	1.1	no	52.5	55.3	0.2	no	46.7	43.9	49.4	1.4	no	52.8	55.4	0.3	no	46.8
17N 3.OG	47.6	50.8	2.8	no	54.2	56.2	0.7	no	47.6	49.2	51.7	3.7	no	55.1	56.4	0.9	no	47.8
17N 4.OG	47.8	50.9	2.9	no	54.3	55.8	0.7	no	47.2	51.4	53.0	5.0	yes	56.4	56.6	1.5	no	48.0
17N 5.OG	48.1	51.1	3.1	no	54.5	55.7	0.8	no	47.1	53.1	54.3	6.3	yes	57.7	57.1	2.2	no	48.5
17N 6.OG	48.3	51.2	3.2	no	54.6	55.5	0.9	no	46.9	54.2	55.1	7.1	yes	58.5	57.4	2.8	no	48.8
17N 7.OG	48.6	51.3	3.3	no	54.7	55.5	1.0	no	46.9	54.8	55.6	7.6	yes	59.0	57.7	3.2	no	49.1
18S 1.OG	35.7	58.8	0.0	no	59.4	52.1	0.1	no	54.2	38.2	58.8	0.0	no	59.4	52.2	0.2	no	54.3
18S 2.OG	37.4	59.0	0.0	no	59.6	52.1	0.1	no	54.2	40.0	59.1	0.1	no	59.7	52.3	0.3	no	54.4
18N 1.OG	34.9	48.2	0.2	no	48.8	52.1	0.1	no	54.2	37.4	48.4	0.4	no	49.0	52.1	0.1	no	54.2
18N 2.OG	35.8	48.3	0.3	no	48.9	52.1	0.1	no	54.2	38.3	48.4	0.4	no	49.0	52.2	0.2	no	54.3
19S	40.4	56.2	0.1	no	57.6	56.0	0.1	no	56.5	42.7	56.3	0.2	no	57.7	56.1	0.2	no	56.6
19W	39.2	49.6	0.4	no	51.0	52.2	0.2	no	52.7	41.2	49.8	0.6	no	51.2	52.3	0.3	no	52.8
19N	39.0	48.5	0.5	no	49.9	52.2	0.2	no	52.7	41.1	48.8	0.8	no	50.2	52.3	0.3	no	52.8
19E	39.4	48.6	0.6	no	50.0	52.2	0.2	no	52.7	41.6	48.9	0.9	no	50.3	52.4	0.4	no	52.9
20S 1.OG	45.2	52.5	0.9	no	55.3	55.3	0.4	no	59.0	46.4	52.7	1.1	no	55.5	55.5	0.6	no	59.2
20S 2.OG	49.0	53.6	1.9	no	56.4	56.0	1.0	no	59.7	48.8	53.5	1.8	no	56.3	55.9	0.9	no	59.6
20S 3.OG	51.1	54.1	3.0	no	56.9	56.1	1.6	no	59.8	51.8	54.5	3.4	no	57.3	56.4	1.9	no	60.1
20E 1.OG	45.7	50.0	2.0	no	52.8	52.9	0.9	no	56.6	46.2	50.2	2.2	no	53.0	53.0	1.0	no	56.7
20E 2.OG	49.0	51.5	3.5	no	54.3	53.8	1.8	no	57.5	49.7	51.9	3.9	no	54.7	54.0	2.0	no	57.7
20E 3.OG	53.0	54.2	6.2	yes	57.0	55.5	3.5	no	59.2	53.7	54.7	6.7	yes	57.5	55.9	3.9	no	59.6
20W 1.OG	37.8	50.9	0.2	no	53.7	55.0	0.1	no	58.7	40.5	51.1	0.4	no	53.9	55.1	0.2	no	58.8
20W 2.OG	38.4	50.8	0.3	no	53.6	54.8	0.1	no	58.5	40.8	50.9	0.4	no	53.7	54.9	0.2	no	58.6
20W 3.OG	40.7	50.4	0.5	no	53.2	54.3	0.2	no	58.0	43.0	50.7	0.8	no	53.5	54.4	0.3	no	58.1
21E 1.OG	42.0	49.1	0.9	no	51.9	52.6	0.4	no	56.3	43.9	49.6	1.4	no	52.4	52.8	0.6	no	56.5
21E 2.OG	44.3	50.3	1.2	no	53.1	53.7	0.5	no	57.4	46.0	50.8	1.7	no	53.6	54.0	0.8	no	57.7
21E 3.OG	47.1	51.3	2.0	no	54.1	54.2	1.0	no	57.9	48.9	52.1	2.8	no	54.9	54.6	1.4	no	58.3
21E 4.OG	50.6	52.9	3.8	no	55.7	55.0	1.9	no	58.7	53.9	55.1	6.0	yes	57.9	56.5	3.4	no	60.2
21S 1.OG	40.4	48.7	0.7	no	51.5	52.3	0.3	no	56.0	44.0	49.5	1.5	no	52.3	52.6	0.6	no	56.3
21S 2.OG	43.0	49.2	1.2	no	52.0	52.5	0.5	no	56.2	46.9	50.5	2.5	no	53.3	53.2	1.2	no	56.9
21S 3.OG	46.7	50.4	2.4	no	53.2	53.1	1.1	no	56.8	50.9	52.7	4.7	no	55.5	54.5	2.5	no	58.2
21S 4.OG	50.7	52.6	4.6	no	55.4	54.4	2.4	no	58.1	55.6	56.3	8.3	yes	59.1	57.2	5.2	yes	60.9
21N 1.OG	35.9	48.3	0.3	no	51.1	52.1	0.1	no	55.8	38.7	48.5	0.5	no	51.3	52.2	0.2	no	55.9
21N 2.OG	36.0	48.3	0.3	no	51.1	52.1	0.1	no	55.8	39.0	48.5	0.5	no	51.3	52.2	0.2	no	55.9
21N 3.OG	36.4	48.3	0.3	no	51.1	52.1	0.1	no	55.8	39.0	48.5	0.5	no	51.3	52.2	0.2	no	55.9
21N 4.OG	39.9	48.6	0.6	no	51.4	52.3	0.3	no	56.0	41.8	48.9	0.9	no	51.7	52.4	0.4	no	56.1
22E 1.OG	40.7	48.7	0.7	no	52.1	62.3	0.0	no	53.7	44.5	49.6	1.6	no	53.0	62.4	0.1	no	53.8
22E 2.OG	43.2	49.2	1.2	no	52.6	63.0	0.0	no	54.4	47.0	50.5	2.5	no	53.9	63.1	0.1	no	54.5
22E 3.OG	46.7	50.4	2.4	no	53.8	63.2	0.1	no	54.6	49.6	51.9	3.9	no	55.3	63.3	0.2	no	54.7
22E 4.OG	51.7	53.2	5.2	yes	56.6	63.2	0.3	no	54.6	53.6	54.7	6.7	yes	58.1	63.4	0.5	no	54.8
22E 5.OG	53.4	54.5	6.5	yes	57.9	63.2	0.5	no	54.6	58.0	58.4	10.4	yes	61.8	64.0	1.3	no	55.4
22E 6.OG	53.9	54.9	6.9	yes	58.3	62.9	0.6	no	54.3	59.3	59.6	11.6	yes	63.0	64.1	1.8	no	55.5
22E 7.OG	54.1	55.1	7.1	yes	58.5	62.7	0.6	no	54.1	61.0	61.2	13.2	yes	64.6	64.6	2.5	no	56.0
22E 8.OG	54.1	55.1	7.1	yes	58.5	62.5	0.7	no	53.9	61.5	61.7	13.7	yes	65.1	64.7	2.9	no	56.1
22E 9.OG	54.2	55.1	7.1	yes	58.5	62.3	0.7	no	53.7	62.0	62.2	14.2	yes	65.6	64.8	3.2	no	56.2
22S 1.OG	44.5	49.6	1.6	no	53.0	59.9	0.1	no	51.3	50.4	52.4	4.4	no	55.8	60.3	0.5	no	51.7
22S 2.OG	48.0	51.0	3.0	no	54.4	60.7	0.2	no	52.1	54.3	55.2	7.2	yes	58.6	61.4	0.9	no	52.8
22S 3.OG	50.1	52.2	4.2	no	55.6	61.1	0.4	no	52.5	54.8	55.6	7.6	yes	59.0	61.7	1.0	no	53.1
22S 4.OG	51.1	52.8	4.8	no	56.2	61.2	0.5	no	52.6	56.0	56.6	8.6	yes	60.0	62.0	1.3	no	53.4
22S 5.OG	51.2	52.9	4.9	no	56.3	61.0	0.5	no	52.4	57.4	57.9	9.9	yes	61.3	62.2	1.7	no	53.6
22S 6.OG	51.8	53.3	5.3	yes	56.7	60.9	0.6	no	52.3	58.0	58.4	10.4	yes	61.8	62.3	2.0	no	53.7
22S 7.OG	52.2	53.6	5.6	yes	57.0	60.8	0.6	no	52.2	58.9	59.2	11.2	yes	62.6	62.6	2.4	no	54.0
22S 8.OG	52.2	53.6	5.6	yes	57.0	60.8	0.7	no	52.2	59.5	59.8	11.8	yes	63.2	62.8	2.7	no	54.2
22S 9.OG	52.3	53.7	5.7	yes	57.1	60.5	0.7	no	51.9	60.2	60.5	12.5	yes	63.9	63.0	3.2	no	54.4
22N 1.OG	37.1	48.3	0.3	no	51.7	52.7	0.1	no	44.1	39.9	48.6	0.6	no	52.0	52.8	0.2	no	44.2
22N 2.OG	37.6	48.4	0.4	no	51.8	54.1	0.1	no	45.5	40.4	48.7	0.7	no	52.1	54.2	0.2	no	45.6
22N 3.OG	38.2	48.4	0.4	no	51.8	55.1	0.1	no	46.5	40.9	48.8	0.8	no	52.2	55.2	0.2	no	46.6
22N 4.OG	39.4	48.6	0.6	no	52.0	55.6	0.1	no	47.0	41.9	49.0	1.0	no	52.4	55.7	0.2	no	47.1
22N 5.OG	45.1	49.8	1.8	no	53.2	56.2	0.4	no	47.6	49.5	51.8	3.8	no	55.2	56.7	0.9	no	48.1
22N 6.OG	47.2	50.6	2.6	no	54.0	56.4	0.5	no	47.8	50.5	52.4	4.4	no	55.8	57.0	1.1	no	48.4
22N 7.OG	47.2	50.6	2.6	no	54.0	56.3	0.6	no	47.7	50.9	52.7	4.7	no	56.1	56.9	1.2	no	48.3
22N 8.OG	47.3	50.7	2.7	no	54.1	56.2	0.6	no	47.6	51.4	53.0	5.0	yes	56.4	57.0	1.4	no	48.4
22N 9.OG	47.6	50.8	2.8	no	54.2	56.3	0.6	no	47.7	52.1	53.5	5.5	yes	56.9	57.3	1.6	no	48.7
22W 1.OG	35.8	48.3	0.3	no	51.7	52.1	0.1	no	43.5	38.9	48.5	0.5	no	51.9	52.2	0.2	no	43.6
22W 2.OG	35.8	48.3	0.3	no	51.7	52.1	0.1	no	43.5	39.5	48.6	0.6	no	52.0	52.2	0.2	no	43.6

Receptor Name	CP-2 Sub-Structure - 24 Months: Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment	CP-3 Install equipment and Conveyance Systems - 2 Months Overlap: Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
1	44.3	54.4	0.5	no	57.2	57.2	0.2	no	60.0	52.1	56.1	2.2	no	58.9	58.2	1.2	no	61.0
2	64.0	64.5	9.2	yes	66.8	68.8	1.7	no	71.1	69.5	69.7	14.4	yes	72.0	71.5	4.4	yes	73.8
3	56.2	59.4	2.8	no	60.9	69.6	0.2	no	71.1	59.2	61.1	4.5	no	62.6	69.8	0.4	no	71.3
4	41.3	54.2	0.2	no	54.7	62.0	0.0	no	62.5	44.2	54.4	0.4	no	54.9	62.1	0.1	no	62.6
5	61.2	62.1	7.5	yes	65.2	63.7	3.6	no	66.8	64.5	64.9	10.3	yes	68.0	65.8	5.7	yes	68.9
6	51.2	55.6	1.9	no	59.0	71.7	0.0	no	75.1	46.4	54.4	0.7	no	57.8	71.7	0.0	no	75.1
7	47.7	59.2	0.3	no	59.8	53.4	1.4	no	54.0	47.2	59.2	0.3	no	59.8	53.2	1.2	no	53.8
8	60.2	65.4	1.5	no	71.3	74.0	0.2	no	79.9	63.0	66.5	2.6	no	72.4	74.1	0.3	no	80.0
9	34.9	61.6	0.0	no	63.0	61.5	0.0	no	62.9	38.7	61.6	0.0	no	63.0	61.5	0.0	no	62.9
10	62.6	63.6	7.0	yes	66.8	65.0	3.8	yes	68.2	67.1	67.5	10.9	yes	70.7	68.1	6.9	yes	71.3
11	48.2	55.3	1.0	no	58.5	55.8	0.8	no	59.0	48.0	55.2	0.9	no	58.4	55.8	0.8	no	59.0
12S 1.OG	37.8	53.9	0.1	no	55.3	54.1	0.1	no	54.6	38.9	53.9	0.1	no	55.3	54.1	0.1	no	54.6
12S 2.OG	42.9	54.3	0.3	no	55.7	54.5	0.3	no	55.0	43.0	54.3	0.3	no	55.7	54.5	0.3	no	55.0
12N 1.OG	29.7	48.1	0.1	no	49.5	52.0	0.0	no	52.5	33.9	48.2	0.2	no	49.6	52.1	0.1	no	52.6
12N 2.OG	33.0	48.1	0.1	no	49.5	52.1	0.1	no	52.6	36.5	48.3	0.3	no	49.7	52.1	0.1	no	52.6
13W 1.OG	28.2	57.2	0.0	no	58.6	54.2	0.0	no	54.7	33.2	57.2	0.0	no	58.6	54.2	0.0	no	54.7
13W 2.OG	28.6	57.3	0.0	no	58.7	54.4	0.0	no	54.9	33.4	57.3	0.0	no	58.7	54.4	0.0	no	54.9
13W 3.OG	30.7	56.7	0.0	no	58.1	54.0	0.0	no	54.5	35.1	56.7	0.0	no	58.1	54.1	0.1	no	54.6
13S 1.OG	31.8	53.0	0.0	no	54.4	52.0	0.0	no	52.5	35.6	53.1	0.1	no	54.5	52.1	0.1	no	52.6
13S 2.OG	38.5	53.5	0.1	no	54.9	52.2	0.2	no	52.7	39.8	53.6	0.2	no	55.0	52.3	0.3	no	52.8
13S 3.OG	41.8	53.6	0.3	no	55.0	52.4	0.4	no	52.9	42.6	53.7	0.4	no	55.1	52.5	0.5	no	53.0
13N 1.OG	33.9	55.0	0.0	no	56.4	53.3	0.0	no	53.8	36.8	55.1	0.1	no	56.5	53.4	0.1	no	53.9
13N 2.OG	37.6	55.8	0.1	no	57.2	54.2	0.1	no	54.7	39.6	55.8	0.1	no	57.2	54.3	0.2	no	54.8
13N 3.OG	41.3	55.7	0.2	no	57.1	54.1	0.2	no	54.6	44.3	55.8	0.3	no	57.2	54.4	0.5	no	54.9
14S 1.OG	32.2	54.7	0.0	no	56.1	54.9	0.0	no	55.4	36.0	54.8	0.1	no	56.2	55.0	0.1	no	55.5
14S 2.OG	34.1	54.7	0.0	no	56.1	54.9	0.0	no	55.4	37.4	54.8	0.1	no	56.2	55.0	0.1	no	55.5
14S 3.OG	39.2	54.3	0.1	no	55.7	54.4	0.1	no	54.9	39.6	54.3	0.1	no	55.7	54.4	0.1	no	54.9
14S 4.OG	42.4	54.0	0.3	no	55.4	54.1	0.3	no	54.6	43.0	54.1	0.4	no	55.5	54.1	0.3	no	54.6
14N 1.OG	30.0	48.1	0.1	no	49.5	52.0	0.0	no	52.5	34.6	48.2	0.2	no	49.6	52.1	0.1	no	52.6
14N 2.OG	31.1	48.1	0.1	no	49.5	52.0	0.0	no	52.5	35.4	48.2	0.2	no	49.6	52.1	0.1	no	52.6
14N 3.OG	36.0	48.3	0.3	no	49.7	52.1	0.1	no	52.6	38.6	48.5	0.5	no	49.9	52.2	0.2	no	52.7
14N 4.OG	38.4	48.5	0.5	no	49.9	52.2	0.2	no	52.7	40.6	48.7	0.7	no	50.1	52.3	0.3	no	52.8
15N 1.OG	31.1	55.6	0.0	no	57.0	54.8	0.0	no	55.3	34.8	55.6	0.0	no	57.0	54.8	0.0	no	55.3
15N 2.OG	33.8	56.0	0.0	no	57.4	55.2	0.0	no	55.7	36.1	56.0	0.0	no	57.4	55.3	0.1	no	55.8
15N 3.OG	37.6	55.7	0.1	no	57.1	54.9	0.1	no	55.4	38.1	55.7	0.1	no	57.1	54.9	0.1	no	55.4
15N 4.OG	41.4	55.3	0.2	no	56.7	54.5	0.2	no	55.0	43.2	55.4	0.3	no	56.8	54.6	0.3	no	55.1
15E 1.OG	40.4	57.2	0.1	no	58.6	54.6	0.2	no	55.1	42.1	57.2	0.1	no	58.6	54.6	0.2	no	55.1
15E 2.OG	46.6	57.3	0.4	no	58.7	55.2	0.7	no	55.7	47.6	57.4	0.5	no	58.8	55.3	0.8	no	55.8
15E 3.OG	48.3	56.9	0.6	no	58.3	55.1	1.0	no	55.6	50.2	57.3	1.0	no	58.7	55.6	1.5	no	56.1
15E 4.OG	49.8	56.6	1.0	no	58.0	55.1	1.5	no	55.6	51.1	56.9	1.3	no	58.3	55.5	1.9	no	56.0
16N 1.OG	35.2	48.2	0.2	no	51.6	57.2	0.0	no	48.6	37.4	48.4	0.4	no	51.8	57.2	0.0	no	48.6
16N 2.OG	50.5	52.4	4.4	no	55.8	58.6	0.7	no	50.0	46.8	50.5	2.5	no	53.9	58.2	0.3	no	49.6
16S 1.OG	33.6	48.2	0.2	no	51.6	52.1	0.1	no	43.5	37.4	48.4	0.4	no	51.8	52.1	0.1	no	43.5
16S 2.OG	38.6	48.5	0.5	no	51.9	52.4	0.2	no	43.8	43.5	49.3	1.3	no	52.7	52.7	0.5	no	44.1
17S 1.OG	32.8	48.1	0.1	no	51.5	62.1	0.0	no	53.5	44.1	49.5	1.5	no	52.9	62.2	0.1	no	53.6
17S 2.OG	34.4	48.2	0.2	no	51.6	62.5	0.0	no	53.9	47.7	50.9	2.9	no	54.3	62.6	0.1	no	54.0
17S 3.OG	38.4	48.5	0.5	no	51.9	62.1	0.0	no	53.5	48.7	51.4	3.4	no	54.8	62.3	0.2	no	53.7
17S 4.OG	39.8	48.6	0.6	no	52.0	61.5	0.0	no	52.9	49.2	51.7	3.7	no	55.1	61.7	0.2	no	53.1
17S 5.OG	40.3	48.7	0.7	no	52.1	60.9	0.0	no	52.3	49.4	51.8	3.8	no	55.2	61.2	0.3	no	52.6
17S 6.OG	40.8	48.8	0.8	no	52.2	60.1	0.1	no	51.5	49.6	51.9	3.9	no	55.3	60.4	0.4	no	51.8
17S 7.OG	43.4	49.3	1.3	no	52.7	59.5	0.1	no	50.9	50.0	52.1	4.1	no	55.5	59.9	0.5	no	51.3
17E 1.OG	40.4	48.7	0.7	no	52.1	52.3	0.3	no	43.7	44.3	49.5	1.5	no	52.9	52.7	0.7	no	44.1
17E 2.OG	44.2	49.5	1.5	no	52.9	52.7	0.7	no	44.1	48.2	51.1	3.1	no	54.5	53.5	1.5	no	44.9
17E 3.OG	48.7	51.4	3.4	no	54.8	54.3	1.4	no	45.7	50.8	52.6	4.6	no	56.0	55.0	2.1	no	46.4
17E 4.OG	50.7	52.6	4.6	no	56.0	55.4	1.8	no	46.8	52.0	53.5	5.5	yes	56.9	55.9	2.3	no	47.3
17E 5.OG	51.3	53.0	5.0	yes	56.4	55.9	1.9	no	47.3	52.5	53.8	5.8	yes	57.2	56.3	2.3	no	47.7
17E 6.OG	51.4	53.0	5.0	yes	56.4	56.2	1.7	no	47.6	52.8	54.0	6.0	yes	57.4	56.7	2.2	no	48.1
17E 7.OG	52.6	53.9	5.9	yes	57.3	57.0	2.0	no	48.4	52.9	54.1	6.1	yes	57.5	57.1	2.1	no	48.5
17W 1.OG	30.2	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.4	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17W 2.OG	30.6	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.5	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17W 3.OG	30.6	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.5	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17W 4.OG	30.7	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.5	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17W 5.OG	30.7	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.5	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17W 6.OG	30.8	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.6	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17W 7.OG	31.4	48.1	0.1	no	51.5	52.0	0.0	no	43.4	34.9	48.2	0.2	no	51.6	52.1	0.1	no	43.5
17N 1.OG	34.8	48.2	0.2	no	51.6	53.1	0.1	no	44.5	36.5	48.3	0.3	no	51.7	53.1	0.1	no	44.5
17N 2.OG	39.5	48.6	0.6	no	52.0	55.2	0.1	no	46.6	39.8	48.6	0.6	no	52.0	55.2	0.1	no	46.6
17N 3.OG	45.8	50.0	2.0	no	53.4	55.9	0.4	no	47.3	44.5	49.6	1.6	no	53.0	55.8	0.3	no	47.2
17N 4.OG	47.0	50.5	2.5	no	53.9	55.7	0.6	no	47.1	46.0	50.1	2.1	no	53.5	55.6	0.5	no	47.0
17N 5.OG	48.4	51.2	3.2	no	54.6	55.8	0.9	no	47.2	46.4	50.3	2.3	no	53.7	55.5	0.6	no	46.9
17N 6.OG	50.8	52.6	4.6	no	56.0	56.1	1.5	no	47.5	46.8	50.5	2.5	no	53.9	55.3	0.7	no	46.7
17N 7.OG	50.9	52.7	4.7	no	56.1	56.1	1.6	no	47.5	48.2	51.1	3.1	no	54.5	55.4	0.9	no	46.8
18S 1.OG	31.8	58.8	0.0	no	59.4	52.0	0.0	no	54.1	35.4	58.8	0.0	no	59.4	52.1	0.1	no	54.2
18S 2.OG	33.8	59.0	0.0	no	59.6	52.1	0.1	no	54.2	37.0	59.0	0.0	no	59.6	52.1	0.1	no	54.2
18N 1.OG	30.1	48.1	0.1	no	48.7	52.0	0.0	no	54.1	35.4	48.2	0.2	no	48.8	52.1	0.1	no	54.2
18N 2.OG	31.6	48.1	0.1	no	48.7	52.0	0.0	no	54.1	36.9	48.3	0.3	no	48.9	52.1	0.1	no	54.2
19S	35.7	56.1	0.0	no	57.5	55.9	0.0	no	56.4	39.1	56.2	0.1	no	57.6	56.0	0.1	no	56.5
19W	32.1	49.3	0.1	no	50.7	52.0	0.0	no	52.5	37.5	49.5	0.3	no	50.9	52.2	0.2	no	52.7
19N	32.8	48.1	0.1	no	49.5	52.1	0.1	no	52.6	37.3	48.4	0.4	no	49.8	52.1	0.1	no	52.6
19E	32.2	48.1	0.1	no	49.5	52.0	0.0	no	52.5	37.7	48.4	0.4	no	49.8	52.2	0.2	no	52.7
20S 1.OG	45.2	52.5	0.9	no	55.3	55.3	0.4	no	59.0	47.8	53.1	1.5	no	55.9	55.7	0.8	no	59.4
20S 2.OG	48.7	53.5	1.8	no	56.3	55.9	0.9	no	59.6	50.4	54.1	2.4	no	56.9	56.3	1.3	no	60.0
20S 3.OG	51.0	54.1	3.0	no	56.9	56.1	1.6	no	59.8	52.7	55.0	3.9	no	57.8	56.7	2.2	no	60.4
20E 1.OG	43.3	49.3	1.3	no	52.1	52.5	0.5	no	56.2	42.5	49.1	1.1	no	51.9	52.5	0.5	no	56.2
20E 2.OG	46.4	50.3	2.3	no	53.1	53.1	1.1	no	56.8	45.1	49.8	1.8	no	52.6	52.8	0.8	no	56.5
20E 3.OG	50.8	52.6	4.6	no	55.4	54.5	2.5	no	58.2	49.6	51.9	3.9	no	54.7	54.0	2.0	no	57.7
20W 1.OG	34.9	50.8	0.1	no	53.6	54.9	0.0	no	58.6	38.9	51.0	0.3	no	53.8	55.0	0.1	no	58.7
20W 2.OG	35.1	50.6	0.1	no	53.4	54.7	0.0	no	58.4	39.1	50.8	0.3	no	53.6	54.8	0.1	no	58.5
20W 3.OG	37.7	50.2	0.3	no	53.0	54.2	0.1	no	57.9	40.9	50.4	0.5	no	53.2	54.3	0.2	no	58.0
21E 1.OG	40.9	48.9	0.7	no	51.7	52.5	0.3	no	56.2	47.3	50.8	2.6	no	53.6	53.4	1.2	no	57.1
21E 2.OG	43.5	50.2	1.1	no	53.0	53.6	0.4	no	57.3	50.5	52.9	3.8	no	55.7	55.1	1.9	no	58.8
21E 3.OG	45.9	50.9	1.6	no	53.7	53.9	0.7	no	57.6	51.3	53.4	4.1	no	56.2	55.4	2.2	no	59.1
21E 4.OG	50.4	52.8	3.7	no	55.6	55.0	1.9	no	58.7	53.4	54.8	5.7	yes	57.6	56.3	3.2	no	60.0
21S 1.OG	38.2	48.4	0.4	no	51.2	52.2	0.2	no	55.9	41.9	49.0	1.0	no	51.8	52.4	0.4	no	56.1
21S 2.OG	40.9	48.8	0.8	no	51.6	52.3	0.3	no	56.0	44.5	49.6	1.6	no	52.4	52.7	0.7	no	56.4
21S 3.OG	44.6	49.6	1.6	no	52.4	52.7	0.7	no	56.4	48.0	51.0	3.0	no	53.8	53.5	1.5	no	57.2
21S 4.OG	50.5	52.4	4.4	no	55.2	54.3	2.3	no	58.0	52.7	54.0	6.0	yes	56.8	55.4	3.4	no	59.1
21N 1.OG	33.3	48.1	0.1	no	50.9	52.1	0.1	no	55.8	37.4	48.4	0.4	no	51.2	52.1	0.1	no	55.8
21N 2.OG	33.8	48.2	0.2	no	51.0	52.1	0.1	no	55.8	37.5	48.4	0.4	no	51.2	52.2	0.2	no	55.9
21N 3.OG	33.7	48.2	0.2	no	51.0	52.1	0.1	no	55.8	37.6	48.4	0.4	no	51.2	52.2	0.2	no	55.9
21N 4.OG	36.9	48.3	0.3	no	51.1	52.1	0.1	no	55.8	40.1	48.7	0.7	no	51.5	52.3	0.3	no	56.0
22E 1.OG	39.6	48.6	0.6	no	52.0	62.3	0.0	no	53.7	42.1	49.0	1.0	no	52.4	62.3	0.0	no	53.7
22E 2.OG	42.7	49.1	1.1	no	52.5	63.0	0.0	no	54.4	44.2	49.5	1.5	no	52.9	63.1	0.1	no	54.5
22E 3.OG	45.2	49.8	1.8	no	53.2	63.2	0.1	no	54.6	46.8	50.5	2.5	no	53.9	63.2	0.1	no	54.6
22E 4.OG	49.5	51.8	3.8	no	55.2	63.1	0.2	no	54.5	50.7	52.6	4.6	no	56.0	63.2	0.3	no	54.6
22E 5.OG	54.6	55.5	7.5	yes	58.9	63.3	0.6	no	54.7	55.1	55.9	7.9	yes	59.3	63.4	0.7	no	54.8
22E 6.OG	55.2	56.0	8.0	yes	59.4	63.1	0.8	no	54.5	56.1	56.7	8.7	yes	60.1	63.2	0.9	no	54.6
22E 7.OG	57.7	58.1	10.1	yes	61.5	63.4	1.3	no	54.8	56.5	57.1	9.1	yes	60.5	63.2	1.1	no	54.6
22E 8.OG	57.8	58.2	10.2	yes	61.6	63.3	1.5	no	54.7	56.7	57.2	9.2	yes	60.6	63.0	1.2	no	54.4
22E 9.OG	57.9	58.3	10.3	yes	61.7	63.1	1.5	no	54.5	56.8	57.3	9.3	yes	60.7	62.8	1.2	no	54.2
22S 1.OG	48.1	51.1	3.1	no	54.5	60.1	0.3	no	51.5	44.2	49.5	1.5	no	52.9	59.9	0.1	no	51.3
22S 2.OG	52.7	54.0	6.0	yes	57.4	61.2	0.7	no	52.6	47.2	50.6	2.6	no	54.0	60.7	0.2	no	52.1
22S 3.OG	52.8	54.0	6.0	yes	57.4	61.4	0.7	no	52.8	48.8	51.4	3.4	no	54.8	61.0	0.3	no	52.4
22S 4.OG	53.0	54.2	6.2	yes	57.6	61.4	0.7	no	52.8	51.3	53.0	5.0	yes	56.4	61.2	0.5	no	52.6
22S 5.OG	53.4	54.5	6.5	yes	57.9	61.3	0.8	no	52.7	52.6	53.9	5.9	yes	57.3	61.2	0.7	no	52.6
22S 6.OG	54.9	55.7	7.7	yes	59.1	61.4	1.1	no	52.8	53.8	54.8	6.8	yes	58.2	61.2	0.9	no	52.6
22S 7.OG	55.2	56.0	8.0	yes	59.4	61.4	1.2	no	52.8	54.7	55.5	7.5	yes	58.9	61.3	1.1	no	52.7
22S 8.OG	55.2	56.0	8.0	yes	59.4	61.3	1.2	no	52.7	54.7	55.5	7.5	yes	58.9	61.2	1.1	no	52.6
22S 9.OG	55.3	56.0	8.0	yes	59.4	61.1	1.3	no	52.5	54.7	55.5	7.5	yes	58.9	61.0	1.2	no	52.4
22N 1.OG	34.9	48.2	0.2	no	51.6	52.7	0.1	no	44.1	39.4	48.6	0.6	no	52.0	52.8	0.2	no	44.2
22N 2.OG	35.8	48.3	0.3	no	51.7	54.1	0.1	no	45.5	40.6	48.7	0.7	no	52.1	54.2	0.2	no	45.6
22N 3.OG	36.4	48.3	0.3	no	51.7	55.1	0.1	no	46.5	42.2	49.0	1.0	no	52.4	55.2	0.2	no	46.6
22N 4.OG	37.8	48.4	0.4	no	51.8	55.6	0.1	no	47.0	44.6	49.6	1.6	no	53.0	55.8	0.3	no	47.2
22N 5.OG	49.5	51.8	3.8	no	55.2	56.7	0.9	no	48.1	48.7	51.4	3.4	no	54.8	56.6	0.8	no	48.0
22N 6.OG	51.0	52.8	4.8	no	56.2	57.1	1.2	no	48.5	50.0	52.1	4.1	no	55.5	56.9	1.0	no	48.3
22N 7.OG	51.1	52.8	4.8	no	56.2	57.0	1.3	no	48.4	50.1	52.2	4.2	no	55.6	56.8	1.1	no	48.2
22N 8.OG	51.5	53.1	5.1	yes	56.5	57.0	1.4	no	48.4	50.7	52.6	4.6	no	56.0	56.8	1.2	no	48.2
22N 9.OG	51.8	53.3	5.3	yes	56.7	57.2	1.5	no	48.6	50.9	52.7	4.7	no	56.1	56.9	1.2	no	48.3
22W 1.OG	33.6	48.2	0.2	no	51.6	52.1	0.1	no	43.5	37.0	48.3	0.3	no	51.7	52.1	0.1	no	43.5
22W 2.OG	34.5	48.2	0.2	no	51.6	52.1	0.1	no	43.5	37.2	48.3	0.3	no	51.7	52.1	0.1	no	43.5

					CP-1																		CP-2			
					Demolition - 6 Month									SOE - 13 Months									Excavation and Remediation - 10 months			
						Weekend				Weekday					Weekend				Weekday					Weekend		
Receptor Name	ID	Height	Existing weekend Leq adjusted	Existing weekday Leq adjusted	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?
		(m)																								
22W 3.OG	22W	5	48.0	52.7	34.0	48.2	0.2	no	51.6	52.8	0.1	no	44.2	36.0	48.3	0.3	no	51.7	52.8	0.1	no	44.2	39.6	48.6	0.6	no
22W 4.OG	22W	8.5	48.0	53.0	34.0	48.2	0.2	no	51.6	53.1	0.1	no	44.5	36.0	48.3	0.3	no	51.7	53.1	0.1	no	44.5	39.7	48.6	0.6	no
22W 5.OG	22W	1.5	48.0	53.0	34.3	48.2	0.2	no	51.6	53.1	0.1	no	44.5	36.1	48.3	0.3	no	51.7	53.1	0.1	no	44.5	40.0	48.6	0.6	no
22W 6.OG	22W	5	48.0	53.1	34.4	48.2	0.2	no	51.6	53.2	0.1	no	44.6	36.2	48.3	0.3	no	51.7	53.2	0.1	no	44.6	40.2	48.7	0.7	no
22W 7.OG	22W	8.5	48.0	53.2	34.6	48.2	0.2	no	51.6	53.3	0.1	no	44.7	36.2	48.3	0.3	no	51.7	53.3	0.1	no	44.7	41.5	48.9	0.9	no
22W 8.OG	22W	1.5	48.0	53.2	35.2	48.2	0.2	no	51.6	53.3	0.1	no	44.7	36.3	48.3	0.3	no	51.7	53.3	0.1	no	44.7	41.7	48.9	0.9	no
22W 9.OG	22W	4.3	48.0	53.2	35.2	48.2	0.2	no	51.6	53.3	0.1	no	44.7	36.3	48.3	0.3	no	51.7	53.3	0.1	no	44.7	41.9	49.0	1.0	no
23S 1.OG	23S	7.1	48.0	66.8	44.8	49.7	1.7	no	53.1	66.8	0.0	no	58.2	48.6	51.3	3.3	no	54.7	66.9	0.1	no	58.3	55.1	55.9	7.9	yes
23S 2.OG	23S	1.5	48.0	66.6	49.5	51.8	3.8	no	55.2	66.7	0.1	no	58.1	53.1	54.3	6.3	yes	57.7	66.8	0.2	no	58.2	59.4	59.7	11.7	yes
23S 3.OG	23S	4.3	48.0	65.7	53.0	54.2	6.2	yes	57.6	65.9	0.2	no	57.3	53.8	54.8	6.8	yes	58.2	66.0	0.3	no	57.4	60.4	60.6	12.6	yes
23E 1.OG	23E	7.1	48.0	62.1	47.8	50.9	2.9	no	54.3	62.3	0.2	no	53.7	46.2	50.2	2.2	no	53.6	62.2	0.1	no	53.6	53.0	54.2	6.2	yes
23E 2.OG	23E	1.5	48.0	62.5	52.1	53.5	5.5	yes	56.9	62.9	0.4	no	54.3	51.3	53.0	5.0	yes	56.4	62.8	0.3	no	54.2	57.1	57.6	9.6	yes
23E 3.OG	23E	5.4	48.0	62.2	54.3	55.2	7.2	yes	58.6	62.9	0.7	no	54.3	55.5	56.2	8.2	yes	59.6	63.0	0.8	no	54.4	59.9	60.2	12.2	yes
23W 1.OG	23W	1.5	49.1	64.6	36.1	49.3	0.2	no	52.7	64.6	0.0	no	56.0	38.8	49.5	0.4	no	52.9	64.6	0.0	no	56.0	42.3	49.9	0.8	no
23W 2.OG	23W	5.4	48.8	64.3	36.6	49.1	0.3	no	52.5	64.3	0.0	no	55.7	39.5	49.3	0.5	no	52.7	64.3	0.0	no	55.7	43.3	49.9	1.1	no
23W 3.OG	23W	1.5	48.0	63.6	38.3	48.4	0.4	no	51.8	63.6	0.0	no	55.0	41.8	48.9	0.9	no	52.3	63.6	0.0	no	55.0	44.7	49.7	1.7	no
24N 1.OG	24N	6.1	48.0	62.5	42.9	49.2	1.2	no	52.6	62.5	0.0	no	53.9	47.4	50.7	2.7	no	54.1	62.6	0.1	no	54.0	54.3	55.2	7.2	yes
24N 2.OG	24N	1.5	48.0	63.0	47.2	50.6	2.6	no	54.0	63.1	0.1	no	54.5	51.5	53.1	5.1	yes	56.5	63.3	0.3	no	54.7	57.6	58.1	10.1	yes
24N 3.OG	24N	6.1	48.0	62.9	48.1	51.1	3.1	no	54.5	63.0	0.1	no	54.4	51.9	53.4	5.4	yes	56.8	63.2	0.3	no	54.6	58.2	58.6	10.6	yes
24E 1.OG	24E	1.5	50.1	66.1	43.2	50.9	0.8	no	54.3	66.1	0.0	no	57.5	42.8	50.8	0.7	no	54.2	66.1	0.0	no	57.5	51.3	53.8	3.7	no
24E 2.OG	24E	6.1	49.8	65.9	47.6	51.8	2.0	no	55.2	66.0	0.1	no	57.4	47.3	51.7	1.9	no	55.1	66.0	0.1	no	57.4	55.2	56.3	6.5	yes
24E 3.OG	24E	1.5	49.1	65.3	48.7	51.9	2.8	no	55.3	65.4	0.1	no	56.8	49.3	52.2	3.1	no	55.6	65.4	0.1	no	56.8	55.6	56.5	7.4	yes
25S 1.OG	25S	5.3	48.0	63.6	44.7	49.7	1.7	no	53.1	63.7	0.1	no	55.1	37.4	48.4	0.4	no	51.8	63.6	0.0	no	55.0	53.4	54.5	6.5	yes
25S 2.OG	25S	9.1	48.0	63.8	49.4	51.8	3.8	no	55.2	64.0	0.2	no	55.4	39.8	48.6	0.6	no	52.0	63.8	0.0	no	55.2	57.6	58.1	10.1	yes
25E 1.OG	25E	12.9	49.3	65.2	45.3	50.8	1.5	no	54.2	65.2	0.0	no	56.6	43.2	50.3	1.0	no	53.7	65.2	0.0	no	56.6	51.8	53.7	4.4	no
25E 2.OG	25E	16.7	48.9	65.1	50.3	52.7	3.8	no	56.1	65.2	0.1	no	56.6	48.2	51.6	2.7	no	55.0	65.2	0.1	no	56.6	56.3	57.0	8.1	yes
26S 1.OG	26S	20.5	48.0	62.1	36.0	48.3	0.3	no	51.7	62.1	0.0	no	53.5	37.2	48.3	0.3	no	51.7	62.1	0.0	no	53.5	47.9	51.0	3.0	no
26S 2.OG	26S	1.5	48.0	62.6	45.4	49.9	1.9	no	53.3	62.7	0.1	no	54.1	39.0	48.5	0.5	no	51.9	62.6	0.0	no	54.0	52.2	53.6	5.6	yes
26E 1.OG	26E	5.3	49.2	63.2	45.4	50.7	1.5	no	54.1	63.3	0.1	no	54.7	43.0	50.1	0.9	no	53.5	63.2	0.0	no	54.6	50.7	53.0	3.8	no
26E 2.OG	26E	9.1	48.6	63.4	53.4	54.6	6.0	yes	58.0	63.8	0.4	no	55.2	50.5	52.7	4.1	no	56.1	63.6	0.2	no	55.0	57.3	57.8	9.2	yes
26N 1.OG	26N	12.9	48.0	57.3	42.2	49.0	1.0	no	52.4	57.4	0.1	no	48.8	43.1	49.2	1.2	no	52.6	57.5	0.2	no	48.9	46.3	50.2	2.2	no
26N 2.OG	26N	16.7	48.0	58.1	52.1	53.5	5.5	yes	56.9	59.1	1.0	no	50.5	50.4	52.4	4.4	no	55.8	58.8	0.7	no	50.2	55.5	56.2	8.2	yes
27S 1.OG	27S	20.5	57.7	52.0	33.5	57.7	0.0	no	58.3	52.1	0.1	no	54.2	36.1	57.7	0.0	no	58.3	52.1	0.1	no	54.2	39.1	57.8	0.1	no
27S 2.OG	27S	1.5	58.3	52.0	36.5	58.3	0.0	no	58.9	52.1	0.1	no	54.2	38.8	58.3	0.0	no	58.9	52.2	0.2	no	54.3	43.0	58.4	0.1	no
27S 3.OG	27S	5.3	58.2	52.0	42.3	58.3	0.1	no	58.9	52.4	0.4	no	54.5	43.1	58.3	0.1	no	58.9	52.5	0.5	no	54.6	48.5	58.6	0.4	no
27S 4.OG	27S	9.1	57.8	52.0	43.1	57.9	0.1	no	58.5	52.5	0.5	no	54.6	44.3	58.0	0.2	no	58.6	52.7	0.7	no	54.8	49.3	58.4	0.6	no
27S 5.OG	27S	12.9	57.4	52.0	43.8	57.6	0.2	no	58.2	52.6	0.6	no	54.7	45.1	57.6	0.2	no	58.2	52.8	0.8	no	54.9	50.1	58.1	0.7	no
27S 6.OG	27S	16.7	56.9	52.0	44.7	57.2	0.3	no	57.8	52.7	0.7	no	54.8	46.3	57.3	0.4	no	57.9	53.0	1.0	no	55.1	50.7	57.8	0.9	no
27E 1.OG	27E	20.5	55.2	52.0	39.8	55.3	0.1	no	55.9	52.3	0.3	no	54.4	40.9	55.4	0.2	no	56.0	52.3	0.3	no	54.4	44.7	55.6	0.4	no
27E 2.OG	27E	1.5	57.0	52.0	44.0	57.2	0.2	no	57.8	52.6	0.6	no	54.7	45.1	57.3	0.3	no	57.9	52.8	0.8	no	54.9	47.4	57.5	0.5	no
27E 3.OG	27E	5.3	57.7	52.0	46.8	58.0	0.3	no	58.6	53.1	1.1	no	55.2	46.9	58.0	0.3	no	58.6	53.2	1.2	no	55.3	50.6	58.5	0.8	no
27E 4.OG	27E	9.1	58.0	52.0	47.3	58.4	0.4	no	59.0	53.3	1.3	no	55.4	47.4	58.4	0.4	no	59.0	53.3	1.3	no	55.4	52.0	59.0	1.0	no
27E 5.OG	27E	12.9	58.4	52.0	47.6	58.7	0.3	no	59.3	53.3	1.3	no	55.4	48.1	58.8	0.4	no	59.4	53.5	1.5	no	55.6	53.1	59.5	1.1	no
27E 6.OG	27E	16.7	58.6	52.0	48.0	59.0	0.4	no	59.6	53.5	1.5	no	55.6	48.9	59.0	0.4	no	59.6	53.7	1.7	no	55.8	53.6	59.8	1.2	no
27W 1.OG	27W	20.5	51.4	52.0	30.7	51.4	0.0	no	52.0	52.0	0.0	no	54.1	32.9	51.5	0.1	no	52.1	52.1	0.1	no	54.2	35.7	51.5	0.1	no
27W 2.OG	27W	1.5	53.7	52.0	30.9	53.7	0.0	no	54.3	52.0	0.0	no	54.1	33.1	53.7	0.0	no	54.3	52.1	0.1	no	54.2	36.2	53.8	0.1	no
27W 3.OG	27W	6.5	54.8	52.0	31.1	54.8	0.0	no	55.4	52.0	0.0	no	54.1	33.3	54.8	0.0	no	55.4	52.1	0.1	no	54.2	36.4	54.9	0.1	no
27W 4.OG	27W	11.5	55.1	52.0	31.0	55.1	0.0	no	55.7	52.0	0.0	no	54.1	33.1	55.1	0.0	no	55.7	52.1	0.1	no	54.2	36.2	55.2	0.1	no
27W 5.OG	27W	16.5	55.5	52.0	30.9	55.5	0.0	no	56.1	52.0	0.0	no	54.1	33.0	55.5	0.0	no	56.1	52.1	0.1	no	54.2	36.5	55.6	0.1	no
27W 6.OG	27W	21.5	55.6	52.0	32.5	55.6	0.0	no	56.2	52.0	0.0	no	54.1	34.5	55.6	0.0	no	56.2	52.1	0.1	no	54.2	37.6	55.7	0.1	no
27N 1.OG	27N	26.5	62.1	52.0	32.3	62.1	0.0	no	62.7	52.0	0.0	no	54.1	34.2	62.1	0.0	no	62.7	52.1	0.1	no	54.2	37.1	62.1	0.0	no
27N 2.OG	27N	31.5	62.9	52.0	34.3	62.9	0.0	no	63.5	52.1	0.1	no	54.2	36.1	62.9	0.0	no	63.5	52.1	0.1	no	54.2	39.0	62.9	0.0	no
27N 3.OG	27N	36.5	62.7	52.0	37.6	62.7	0.0	no	63.3	52.2	0.2	no	54.3	39.4	62.7	0.0	no	63.3	52.2	0.2	no	54.3	41.7	62.7	0.0	no
27N 4.OG	27N	1.5	62.3	52.0	44.9	62.4	0.1	no	63.0	52.8	0.8	no	54.9	45.1	62.4	0.1	no	63.0	52.8	0.8	no	54.9	47.0	62.4	0.1	no
27N 5.OG	27N	6.5	61.8	52.0	47.1	61.9	0.1	no	62.5	53.2	1.2	no	55.3	46.0	61.9	0.1	no	62.5	53.0	1.0	no	55.1	51.0	62.1	0.3	no
27N 6.OG	27N	11.5	61.4	52.0	47.4	61.6	0.2	no	62.2	53.3	1.3	no	55.4	45.9	61.5	0.1	no	62.1	53.0	1.0	no	55.1	51.5	61.8	0.4	no
28E 1.OG	28E	16.5	48.0	52.0	35.5	48.2	0.2	no	48.8	52.1	0.1	no	54.2	36.8	48.3	0.3	no	48.9	52.1	0.1	no	54.2	44.4	49.6	1.6	no
28E 2.OG	28E	21.5	48.0	52.0	38.1	48.4	0.4	no	49.0	52.2	0.2	no	54.3	39.2	48.5	0.5	no	49.1	52.2	0.2	no	54.3	48.6	51.3	3.3	no
28E 3.OG	28E	26.5	48.4	52.0	35.3	48.6	0.2	no	49.2	52.1	0.1	no	54.2	36.3	48.7	0.3	no	49.3	52.1	0.1	no	54.2	48.3	51.4	3.0	no
28E 4.OG	28E	31.5	49.2	52.0	36.1	49.4	0.2	no	50.0	52.1	0.1	no	54.2	37.8	49.5	0.3	no	50.1	52.2	0.2	no	54.3	48.0	51.7	2.5	no
28E 5.OG	28E	36.5	49.6	52.0	38.1	49.9	0.3	no	50.5	52.2	0.2	no	54.3	39.5	50.0	0.4	no	50.6	52.2	0.2	no	54.3	48.3	52.0	2.4	no
28E 6.OG	28E	1.5	50.1	52.0	44.8	51.2	1.1	no	51.8	52.8	0.8	no	54.9	44.8	51.2	1.1	no	51.8	52.8	0.8	no	54.9	53.2	54.9	4.8	no
28E 7.OG	28E	6.5	50.7	52.0	46.2	52.0	1.3	no	52.6	53.0	1.0	no	55.1	47.2	52.3	1.6	no	52.9	53.2	1.2	no	55.3	56.0	57.1	6.4	yes
28E 8.OG	28E	11.5	51.3	52.0	46.2	52.5	1.2	no	53.1	53.0	1.0	no	55.1	47.3	52.8	1.5	no	53.4	53.3	1.3	no	55.4	56.6	57.7	6.4	yes
28W 1.OG	28W	16.5	62.1	52.0	35.5	62.1	0.0	no	62.7	52.1	0.1	no	54.2	37.9	62.1	0.0	no	62.7	52.2	0.2	no	54.3	42.1	62.1	0.0	no
28W 2.OG	28W	21.5	62.1	52.0	37.6	62.1	0.0	no	62.7	52.2	0.2	no	54.3	38.6	62.1	0.0	no	62.7	52.2	0.2	no	54.3	44.3	62.2	0.1	no
28W 3.OG	28W	26.5	61.3	52.0	36.9	61.3	0.0	no	61.9	52.1	0.1	no	54.2	39.3	61.3	0.0	no	61.9	52.2	0.2	no	54.3	45.2	61.4	0.1	no
28W 4.OG	28W	31.5	60.5	52.0	42.1	60.6	0.1	no	61.2	52.4	0.4	no	54.5	40.0	60.5	0.0	no	61.1	52.3	0.3	no	54.4	45.3	60.6	0.1	no
28W 5.OG	28W	36.5	59.9	52.0	42.9	60.0	0.1	no	60.6	52.5	0.5	no	54.6	40.8	60.0	0.1	no	60.6	52.3	0.3	no	54.4	46.3	60.1	0.2	no
28W 6.OG	28W	1.5	59.1	52.0	43.8	59.2	0.1	no	59.8	52.6	0.6	no	54.7	43.6	59.2	0.1	no	59.8	52.6	0.6	no	54.7	47.7	59.4	0.3	no
28W 7.OG	28W	6.5	58.7	52.0	44.8	58.9	0.2	no	59.5	52.8	0.8	no	54.9	44.1	58.8	0.1	no	59.4	52.7	0.7	no	54.8	48.2	59.1	0.4	no
28W 8.OG	28W	11.5	57.9	52.0	45.7	58.2	0.3	no	58.8	52.9	0.9	no	55.0	44.6	58.1	0.2	no	58.7	52.7	0.7	no	54.8	49.1	58.4	0.5	no
28N 1.OG	28N	16.5	60.8	52.3	31.8	60.8	0.0	no	61.4	52.3	0.0	no	54.4	34.3	60.8	0.0	no	61.4	52.4	0.1	no	54.5	37.1	60.8	0.0	no
28N 2.OG	28N	21.5	59.9	52.0	31.9	59.9	0.0	no	60.5	52.0	0.0	no	54.1	34.5	59.9	0.0	no	60.5	52.1	0.1	no	54.2	37.7	59.9	0.0	no
28N 3.OG	28N	26.5	58.7	52.0	32.0	58.7	0.0	no	59.3	52.0	0.0	no	54.1	34.5	58.7	0.0	no	59.3	52.1	0.1	no	54.2	37.6	58.7	0.0	no
28N 4.OG	28N	31.5	57.7	52.0	32.1	57.7	0.0	no	58.3	52.0	0.0	no	54.1	34.5	57.7	0.0	no	58.3	52.1	0.1	no	54.2	37.5	57.7	0.0	no
28N 5.OG	28N	36.5	56.9	52.0	32.2	56.9	0.0	no	57.5	52.0	0.0	no	54.1	34.6	56.9	0.0	no	57.5	52.1	0.1	no	54.2	37.7	57.0	0.1	no
28N 6.OG	28N	1.5	56.2	52.0	33.0	56.2	0.0	no	56.8	52.1	0.1	no	54.2	35.6	56.2	0.0	no	56.8	52.1	0.1	no	54.2	38.4	56.3	0.1	no
28N 7.OG	28N	4.3	55.7	52.0	35.8	55.7	0.0	no	56.3	52.1	0.1	no	54.2	38.5	55.8	0.1	no	56.4	52.2	0.2	no	54.3	41.1	55.8	0.1	no
28N 8.OG	28N	7.1	55.4	52.0	39.9	55.5	0.1	no	56.1	52.3	0.3	no	54.4	43.0	55.6	0.2	no	56.2	52.5	0.5	no	54.6	44.8	55.8	0.4	no
28S 1.OG	28S	1.5	59.8	52.0	40.5	59.9	0.1	no	60.5	52.3	0.3	no	54.4	43.5	59.9	0.1	no	60.5	52.6	0.6	no	54.7	49.1	60.2	0.4	no
28S 2.OG	28S	4.3	59.3	52.0	45.6	59.5	0.2	no	60.1	52.9	0.9	no	55.0	47.4	59.6	0.3	no	60.2	53.3	1.3	no	55.4	51.8	60.0	0.7	no
28S 3.OG	28S	7.1	58.3	52.0	47.5	58.6	0.3	no	59.2	53.3	1.3	no	55.4	50.6	59.0	0.7	no	59.6	54.4	2.4	no	56.5	54.8	59.9	1.6	no
28S 4.OG	28S	1.5	57.1	52.0	48.6	57.7	0.6	no	58.3	53.6	1.6	no	55.7	51.0	58.1	1.0	no	58.7	54.5	2.5	no	56.6	57.0	60.1	3.0	no
28S 5.OG	28S	4.3	56.4	52.0	50.0	57.3	0.9	no	57.9	54.1	2.1	no	56.2	51.2	57.5	1.1	no	58.1	54.6	2.6	no	56.7	57.6	60.1	3.7	no
28S 6.OG	28S	7.1	48.0	52.0	48.3	51.2	3.2	no	51.8	53.5	1.5	no	55.6	49.8	52.0	4.0	no	52.6	54.0	2.0	no	56.1	53.4	54.5	6.5	yes
28S 7.OG	28S	1.5	48.3	52.0	49.5	52.0	3.7	no	52.6	53.9	1.9	no	56.0	50.2	52.4	4.1	no	53.0	54.2	2.2	no	56.3	57.4	57.9	9.6	yes
28S 8.OG	28S	5.15	49.7	52.0	49.6	52.7	3.0	no	53.3	54.0	2.0	no	56.1	50.3	53.0	3.3	no	53.6	54.2	2.2	no	56.3	57.6	58.3	8.6	yes
29N 1.OG	29N	8.8	61.2	52.0	33.1	61.2	0.0	no	61.8	52.1	0.1	no	54.2	35.9	61.2	0.0	no	61.8	52.1	0.1	no	54.2	38.3	61.2	0.0	no
29N 2.OG	29N	1.5	61.5	52.0	33.2	61.5	0.0	no	62.1	52.1	0.1	no	54.2	36.0	61.5	0.0	no	62.1	52.1	0.1	no	54.2	38.6	61.5	0.0	no
29N 3.OG	29N	5.15	61.2	52.0	34.9	61.2	0.0	no	61.8	52.1	0.1	no	54.2	38.0	61.2	0.0	no	61.8	52.2	0.2	no	54.3	40.4	61.2	0.0	no
29W 1.OG	29W	8.8	62.9	52.0	35.8	62.9	0.0	no	63.5	52.1	0.1	no	54.2	41.7	62.9	0.0	no	63.5	52.4	0.4	no	54.5	42.9	62.9	0.0	no
29W 2.OG	29W	1.5	63.0	52.0	36.3	63.0	0.0	no	63.6	52.1	0.1	no	54.2	44.0	63.1	0.1	no	63.7	52.6	0.6	no	54.7	44.0	63.1	0.1	no
29W 3.OG	29W	5	62.5	52.0	37.6	62.5	0.0	no	63.1	52.2	0.2	no	54.3	44.4	62.6	0.1	no	63.2	52.7	0.7	no	54.8	45.0	62.6	0.1	no
29S 1.OG	29S	8.5	58.0	52.0	34.5	58.0	0.0	no	58.6	52.1	0.1	no	54.2	37.0	58.0	0.0	no	58.6	52.1	0.1	no	54.2	40.2	58.1	0.1	no
29S 2.OG	29S	1.5	58.5	52.0	36.2	58.5	0.0	no	59.1	52.1	0.1	no	54.2	38.9	58.5	0.0	no	59.1	52.2	0.2	no	54.3	42.4	58.6	0.1	no
29S 3.OG	29S	5	58.5	52.0	38.9	58.5	0.0	no	59.1	52.2	0.2	no	54.3	41.7	58.6	0.1	no	59.2	52.4	0.4	no	54.5	45.7	58.7	0.2	no
30S 1.OG	30S	8.5	51.7	54.7	50.6	54.2	2.5	no	57.0	56.1	1.4	no	59.8	52.4	55.1	3.4	no	57.9	56.7	2.0	no	60.4	55.5	57.0	5.3	yes
30S 2.OG	30S	1.5	51.5	54.6	55.6	57.0	5.5	yes	59.8	58.1	3.5	no	61.8	57.2	58.2	6.7	yes	61.0	59.1	4.5	no	62.8	60.2	60.7	9.2	yes
30S 3.OG	30S	5	50.8	53.9	57.1	58.0	7.2	yes	60.8	58.8	4.9	no	62.5	57.8	58.6	7.8	yes	61.4	59.3	5.4	yes	63.0	62.8	63.1	12.3	yes
30N 1.OG	30N	8.5	48.0	52.0	36.5	48.3	0.3	no	51.1	52.1	0.1	no	55.8	39.7	48.6	0.6	no	51.4	52.2	0.2	no	55.9	42.4	49.1	1.1	no
30N 2.OG	30N	1.5	48.0	52.0	36.8	48.3	0.3	no	51.1	52.1	0.1	no	55.8	39.8	48.6	0.6	no	51.4	52.3	0.3	no	56.0	42.8	49.1	1.1	no
30N 3.OG	30N	5	48.0	52.0	39.4	48.6	0.6	no	51.4	52.2	0.2	no	55.9	42.0	49.0	1.0	no	51.8	52.4	0.4	no	56.1	44.9	49.7	1.7	no
31N 1.OG	31N	8.5	50.8	53.9	38.1	51.0	0.2	no	53.8	54.0	0.1	no	57.7	40.9	51.2	0.4	no	54.0	54.1	0.2	no	57.8	44.7	51.8	1.0	no
31N 2.OG	31N	12	50.9	54.0	40.4	51.3	0.4	no	54.1	54.2	0.2	no	57.9	41.7	51.4	0.5	no	54.2	54.2	0.2	no	57.9	45.0	51.9	1.0	no
31N 3.OG	31N	1.5	50.4	53.5	41.5	50.9	0.5	no	53.7	53.8	0.3	no	57.5	43.4	51.2	0.8	no	54.0	53.9	0.4	no	57.6	46.8	52.0	1.6	no
31S 1.OG	31S	5	48.0	52.0	44.9	49.7	1.7	no	52.5	52.8	0.8	no	56.5	45.7	50.0	2.0	no	52.8	52.9	0.9	no	56.6	54.1	55.1	7.1	yes
31S 2.OG	31S	8.5	48.0	52.0	52.0	53.5	5.5	yes	56.3	55.0	3.0	no	58.7	50.9	52.7	4.7	no	55.5	54.5	2.5	no	58.2	57.5	58.0	10.0	yes
31S 3.OG	31S	12	48.0	52.0	54.5	55.4	7.4	yes	58.2	56.4	4.4	no	60.1	53.0	54.2	6.2	yes	57.0	55.5	3.5	no	59.2	60.3	60.5	12.5	yes
31E 1.OG	31E	1.5	48.0	52.0	41.6	48.9	0.9	no	51.7	52.4	0.4	no	56.1	40.6	48.7	0.7	no	51.5	52.3	0.3	no	56.0	44.0	49.5	1.5	no
31E 2.OG	31E	4.15	48.0	52.0	46.8	50.5	2.5	no	53.3	53.1	1.1	no	56.8	44.0	49.5	1.5	no	52.3	52.6	0.6	no	56.3	51.9	53.4	5.4	yes
31E 3.OG	31E	6.8	48.0	52.0	50.0	52.1	4.1	no	54.9	54.1	2.1	no	57.8	49.7	51.9	3.9	no	54.7	54.0	2.0	no	57.7	53.8	54.8	6.8	yes
32N 1.OG	32N	9.45	59.8	69.7	53.6	60.7	0.9	no	66.6	69.8	0.1	no	72.7	55.3	61.1	1.3	no	67.0	69.9	0.2	no	72.8	60.5	63.2	3.4	no
32N 2.OG	32N	12.1	59.8	69.7	53.7	60.8	1.0	no	66.7	69.8	0.1	no	72.7	55.4	61.1	1.3	no	67.0	69.9	0.2	no	72.8	60.6	63.2	3.4	no
32N 3.OG	32N	14.75	59.1	69.0	53.3	60.1	1.0	no	66.0	69.1	0.1	no	72.0	55.2	60.6	1.5	no	66.5	69.2	0.2	no	72.1	60.3	62.8	3.7	no
32N 4.OG	32N	17.4	58.4	68.3	53.8	59.7	1.3	no	65.6	68.5	0.2	no	71.4	55.1	60.1	1.7	no	66.0	68.5	0.2	no	71.4	60.9	62.8	4.4	no
32S 1.OG	32S	20.05	50.2	56.5	42.3	50.9	0.7	no	56.8	56.7	0.2	no	59.6	44.0	51.1	0.9	no	57.0	56.7	0.2	no	59.6	49.2	52.7	2.5	no
32S 2.OG	32S	22.7	53.0	58.7	43.9	53.5	0.5	no	59.4	58.8	0.1	no	61.7	45.6	53.7	0.7	no	59.6	58.9	0.2	no	61.8	50.8	55.0	2.0	no
32S 3.OG	32S	25.35	53.5	59.1	43.7	53.9	0.4	no	59.8	59.2	0.1	no	62.1	45.4	54.1	0.6	no	60.0	59.3	0.2	no	62.2	50.6	55.3	1.8	no
32S 4.OG	32S	28	53.8	59.1	43.3	54.2	0.4	no	60.1	59.2	0.1	no	62.1	45.1	54.3	0.5	no	60.2	59.3	0.2	no	62.2	50.3	55.4	1.6	no
33S 1.OG	33S	30.65	48.0	52.0	48.4	51.2	3.2	no	53.5	53.6	1.6	no	50.4	49.4	51.8	3.8	no	54.1	53.9	1.9	no	50.7	55.1	55.9	7.9	yes
33S 2.OG	33S	33.3	48.0	52.1	52.6	53.9	5.9	yes	56.2	55.4	3.3	no	52.2	52.7	54.0	6.0	yes	56.3	55.4	3.3	no	52.2	56.9	57.4	9.4	yes
33S 3.OG	33S	35.95	48.0	53.0	52.8	54.0	6.0	yes	56.3	55.9	2.9	no	52.7	53.2	54.3	6.3	yes	56.6	56.1	3.1	no	52.9	57.6	58.1	10.1	yes
33S 4.OG	33S	38.6	48.0	53.5	52.9	54.1	6.1	yes	56.4	56.2	2.7	no	53.0	53.5	54.6	6.6	yes	56.9	56.5	3.0	no	53.3	58.1	58.5	10.5	yes
33S 5.OG	33S	41.25	48.0	53.7	52.9	54.1	6.1	yes	56.4	56.3	2.6	no	53.1	53.8	54.8	6.8	yes	57.1	56.8	3.1	no	53.6	58.8	59.1	11.1	yes
33S 6.OG	33S	43.9	48.0	53.8	52.9	54.1	6.1	yes	56.4	56.4	2.6	no	53.2	53.9	54.9	6.9	yes	57.2	56.9	3.1	no	53.7	59.1	59.4	11.4	yes
33S 7.OG	33S	46.55	48.0	53.9	52.9	54.1	6.1	yes	56.4	56.4	2.5	no	53.2	53.9	54.9	6.9	yes	57.2	56.9	3.0	no	53.7	59.6	59.9	11.9	yes
33S 8.OG	33S	49.2	48.0	53.9	53.0	54.2	6.2	yes	56.5	56.5	2.6	no	53.3	53.9	54.9	6.9	yes	57.2	56.9	3.0	no	53.7	60.1	60.4	12.4	yes
33S 9.OG	33S	51.85	48.0	53.9	53.0	54.2	6.2	yes	56.5	56.5	2.6	no	53.3	54.0	55.0	7.0	yes	57.3	57.0	3.1	no	53.8	60.9	61.1	13.1	yes
33S 10.OG	33S	54.5	48.0	53.9	52.9	54.1	6.1	yes	56.4	56.4	2.5	no	53.2	54.0	55.0	7.0	yes	57.3	57.0	3.1	no	53.8	61.0	61.2	13.2	yes

	CP-2														CP-3								
	Excavation and Remediation - 10 months					Sub-Structure - 24 Months									Install equipment and Conveyance Systems - 2 Months Overlap								
	Weekend	Weekday					Weekend				Weekday					Weekend				Weekday			
Receptor Name	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment
22W 3.OG	52.0	52.9	0.2	no	44.3	34.5	48.2	0.2	no	51.6	52.8	0.1	no	44.2	37.3	48.4	0.4	no	51.8	52.8	0.1	no	44.2
22W 4.OG	52.0	53.2	0.2	no	44.6	34.6	48.2	0.2	no	51.6	53.1	0.1	no	44.5	37.3	48.4	0.4	no	51.8	53.1	0.1	no	44.5
22W 5.OG	52.0	53.2	0.2	no	44.6	35.1	48.2	0.2	no	51.6	53.1	0.1	no	44.5	37.4	48.4	0.4	no	51.8	53.1	0.1	no	44.5
22W 6.OG	52.1	53.3	0.2	no	44.7	35.2	48.2	0.2	no	51.6	53.2	0.1	no	44.6	37.5	48.4	0.4	no	51.8	53.2	0.1	no	44.6
22W 7.OG	52.3	53.5	0.3	no	44.9	35.3	48.2	0.2	no	51.6	53.3	0.1	no	44.7	37.6	48.4	0.4	no	51.8	53.3	0.1	no	44.7
22W 8.OG	52.3	53.5	0.3	no	44.9	35.3	48.2	0.2	no	51.6	53.3	0.1	no	44.7	37.9	48.4	0.4	no	51.8	53.3	0.1	no	44.7
22W 9.OG	52.4	53.5	0.3	no	44.9	35.9	48.3	0.3	no	51.7	53.3	0.1	no	44.7	38.2	48.4	0.4	no	51.8	53.3	0.1	no	44.7
23S 1.OG	59.3	67.1	0.3	no	58.5	51.4	53.0	5.0	yes	56.4	66.9	0.1	no	58.3	48.4	51.2	3.2	no	54.6	66.9	0.1	no	58.3
23S 2.OG	63.1	67.4	0.8	no	58.8	55.9	56.6	8.6	yes	60.0	67.0	0.4	no	58.4	52.4	53.7	5.7	yes	57.1	66.8	0.2	no	58.2
23S 3.OG	64.0	66.8	1.1	no	58.2	56.6	57.2	9.2	yes	60.6	66.2	0.5	no	57.6	54.8	55.6	7.6	yes	59.0	66.0	0.3	no	57.4
23E 1.OG	57.6	62.6	0.5	no	54.0	51.9	53.4	5.4	yes	56.8	62.5	0.4	no	53.9	48.9	51.5	3.5	no	54.9	62.3	0.2	no	53.7
23E 2.OG	61.0	63.6	1.1	no	55.0	56.4	57.0	9.0	yes	60.4	63.5	1.0	no	54.9	53.3	54.4	6.4	yes	57.8	63.0	0.5	no	54.4
23E 3.OG	63.6	64.2	2.0	no	55.6	57.8	58.2	10.2	yes	61.6	63.5	1.3	no	54.9	56.1	56.7	8.7	yes	60.1	63.2	1.0	no	54.6
23W 1.OG	53.3	64.6	0.0	no	56.0	37.4	49.4	0.3	no	52.8	64.6	0.0	no	56.0	39.5	49.6	0.5	no	53.0	64.6	0.0	no	56.0
23W 2.OG	53.3	64.3	0.0	no	55.7	39.2	49.3	0.5	no	52.7	64.3	0.0	no	55.7	39.9	49.3	0.5	no	52.7	64.3	0.0	no	55.7
23W 3.OG	53.1	63.7	0.1	no	55.1	40.3	48.7	0.7	no	52.1	63.6	0.0	no	55.0	41.3	48.8	0.8	no	52.2	63.6	0.0	no	55.0
24N 1.OG	58.6	63.1	0.6	no	54.5	50.1	52.2	4.2	no	55.6	62.7	0.2	no	54.1	45.0	49.8	1.8	no	53.2	62.6	0.1	no	54.0
24N 2.OG	61.5	64.1	1.1	no	55.5	51.0	52.8	4.8	no	56.2	63.3	0.3	no	54.7	48.9	51.5	3.5	no	54.9	63.2	0.2	no	54.6
24N 3.OG	62.0	64.2	1.3	no	55.6	53.1	54.3	6.3	yes	57.7	63.3	0.4	no	54.7	49.9	52.1	4.1	no	55.5	63.1	0.2	no	54.5
24E 1.OG	57.2	66.2	0.1	no	57.6	50.1	53.1	3.0	no	56.5	66.2	0.1	no	57.6	43.7	51.0	0.9	no	54.4	66.1	0.0	no	57.5
24E 2.OG	59.7	66.3	0.4	no	57.7	54.8	56.0	6.2	yes	59.4	66.2	0.3	no	57.6	48.1	52.0	2.2	no	55.4	66.0	0.1	no	57.4
24E 3.OG	59.9	65.7	0.4	no	57.1	55.1	56.1	7.0	yes	59.5	65.7	0.4	no	57.1	49.0	52.1	3.0	no	55.5	65.4	0.1	no	56.8
25S 1.OG	57.9	64.0	0.4	no	55.4	35.9	48.3	0.3	no	51.7	63.6	0.0	no	55.0	48.5	51.3	3.3	no	54.7	63.7	0.1	no	55.1
25S 2.OG	61.5	64.7	0.9	no	56.1	38.5	48.5	0.5	no	51.9	63.8	0.0	no	55.2	52.4	53.7	5.7	yes	57.1	64.1	0.3	no	55.5
25E 1.OG	57.1	65.4	0.2	no	56.8	41.3	49.9	0.6	no	53.3	65.2	0.0	no	56.6	45.2	50.7	1.4	no	54.1	65.2	0.0	no	56.6
25E 2.OG	60.4	65.6	0.5	no	57.0	46.2	50.8	1.9	no	54.2	65.2	0.1	no	56.6	51.2	53.2	4.3	no	56.6	65.3	0.2	no	56.7
26S 1.OG	54.4	62.3	0.2	no	53.7	36.0	48.3	0.3	no	51.7	62.1	0.0	no	53.5	39.3	48.5	0.5	no	51.9	62.1	0.0	no	53.5
26S 2.OG	57.0	63.0	0.4	no	54.4	38.4	48.5	0.5	no	51.9	62.6	0.0	no	54.0	45.8	50.0	2.0	no	53.4	62.7	0.1	no	54.1
26E 1.OG	56.4	63.4	0.2	no	54.8	42.1	50.0	0.8	no	53.4	63.2	0.0	no	54.6	45.3	50.7	1.5	no	54.1	63.3	0.1	no	54.7
26E 2.OG	61.2	64.4	1.0	no	55.8	50.5	52.7	4.1	no	56.1	63.6	0.2	no	55.0	53.6	54.8	6.2	yes	58.2	63.8	0.4	no	55.2
26N 1.OG	53.6	57.6	0.3	no	49.0	41.2	48.8	0.8	no	52.2	57.4	0.1	no	48.8	43.9	49.4	1.4	no	52.8	57.5	0.2	no	48.9
26N 2.OG	59.6	60.0	1.9	no	51.4	50.3	52.3	4.3	no	55.7	58.8	0.7	no	50.2	52.9	54.1	6.1	yes	57.5	59.2	1.1	no	50.6
27S 1.OG	58.4	52.2	0.2	no	54.3	33.8	57.7	0.0	no	58.3	52.1	0.1	no	54.2	36.5	57.7	0.0	no	58.3	52.1	0.1	no	54.2
27S 2.OG	59.0	52.5	0.5	no	54.6	39.2	58.4	0.1	no	59.0	52.2	0.2	no	54.3	39.6	58.4	0.1	no	59.0	52.2	0.2	no	54.3
27S 3.OG	59.2	53.6	1.6	no	55.7	45.5	58.4	0.2	no	59.0	52.9	0.9	no	55.0	44.7	58.4	0.2	no	59.0	52.7	0.7	no	54.8
27S 4.OG	59.0	53.9	1.9	no	56.0	46.1	58.1	0.3	no	58.7	53.0	1.0	no	55.1	46.4	58.1	0.3	no	58.7	53.1	1.1	no	55.2
27S 5.OG	58.7	54.2	2.2	no	56.3	46.5	57.7	0.3	no	58.3	53.1	1.1	no	55.2	47.7	57.8	0.4	no	58.4	53.4	1.4	no	55.5
27S 6.OG	58.4	54.4	2.4	no	56.5	46.8	57.3	0.4	no	57.9	53.1	1.1	no	55.2	48.5	57.5	0.6	no	58.1	53.6	1.6	no	55.7
27E 1.OG	56.2	52.7	0.7	no	54.8	37.4	55.3	0.1	no	55.9	52.1	0.1	no	54.2	43.4	55.5	0.3	no	56.1	52.6	0.6	no	54.7
27E 2.OG	58.1	53.3	1.3	no	55.4	41.5	57.1	0.1	no	57.7	52.4	0.4	no	54.5	47.5	57.5	0.5	no	58.1	53.3	1.3	no	55.4
27E 3.OG	59.1	54.4	2.4	no	56.5	46.7	58.0	0.3	no	58.6	53.1	1.1	no	55.2	49.2	58.3	0.6	no	58.9	53.8	1.8	no	55.9
27E 4.OG	59.6	55.0	3.0	no	57.1	49.0	58.5	0.5	no	59.1	53.8	1.8	no	55.9	50.1	58.7	0.7	no	59.3	54.2	2.2	no	56.3
27E 5.OG	60.1	55.6	3.6	no	57.7	49.5	58.9	0.5	no	59.5	53.9	1.9	no	56.0	50.6	59.1	0.7	no	59.7	54.4	2.4	no	56.5
27E 6.OG	60.4	55.9	3.9	no	58.0	48.9	59.0	0.4	no	59.6	53.7	1.7	no	55.8	51.3	59.3	0.7	no	59.9	54.7	2.7	no	56.8
27W 1.OG	52.1	52.1	0.1	no	54.2	28.5	51.4	0.0	no	52.0	52.0	0.0	no	54.1	33.6	51.5	0.1	no	52.1	52.1	0.1	no	54.2
27W 2.OG	54.4	52.1	0.1	no	54.2	29.1	53.7	0.0	no	54.3	52.0	0.0	no	54.1	33.9	53.7	0.0	no	54.3	52.1	0.1	no	54.2
27W 3.OG	55.5	52.1	0.1	no	54.2	29.5	54.8	0.0	no	55.4	52.0	0.0	no	54.1	34.2	54.8	0.0	no	55.4	52.1	0.1	no	54.2
27W 4.OG	55.8	52.1	0.1	no	54.2	29.2	55.1	0.0	no	55.7	52.0	0.0	no	54.1	34.0	55.1	0.0	no	55.7	52.1	0.1	no	54.2
27W 5.OG	56.2	52.1	0.1	no	54.2	29.1	55.5	0.0	no	56.1	52.0	0.0	no	54.1	33.8	55.5	0.0	no	56.1	52.1	0.1	no	54.2
27W 6.OG	56.3	52.2	0.2	no	54.3	30.6	55.6	0.0	no	56.2	52.0	0.0	no	54.1	35.1	55.6	0.0	no	56.2	52.1	0.1	no	54.2
27N 1.OG	62.7	52.1	0.1	no	54.2	30.7	62.1	0.0	no	62.7	52.0	0.0	no	54.1	35.2	62.1	0.0	no	62.7	52.1	0.1	no	54.2
27N 2.OG	63.5	52.2	0.2	no	54.3	32.9	62.9	0.0	no	63.5	52.1	0.1	no	54.2	37.1	62.9	0.0	no	63.5	52.1	0.1	no	54.2
27N 3.OG	63.3	52.4	0.4	no	54.5	36.1	62.7	0.0	no	63.3	52.1	0.1	no	54.2	40.1	62.7	0.0	no	63.3	52.3	0.3	no	54.4
27N 4.OG	63.0	53.2	1.2	no	55.3	42.9	62.3	0.0	no	62.9	52.5	0.5	no	54.6	46.1	62.4	0.1	no	63.0	53.0	1.0	no	55.1
27N 5.OG	62.7	54.5	2.5	no	56.6	46.3	61.9	0.1	no	62.5	53.0	1.0	no	55.1	48.7	62.0	0.2	no	62.6	53.7	1.7	no	55.8
27N 6.OG	62.4	54.8	2.8	no	56.9	45.5	61.5	0.1	no	62.1	52.9	0.9	no	55.0	49.1	61.6	0.2	no	62.2	53.8	1.8	no	55.9
28E 1.OG	50.2	52.7	0.7	no	54.8	36.2	48.3	0.3	no	48.9	52.1	0.1	no	54.2	39.8	48.6	0.6	no	49.2	52.3	0.3	no	54.4
28E 2.OG	51.9	53.6	1.6	no	55.7	40.2	48.7	0.7	no	49.3	52.3	0.3	no	54.4	43.3	49.3	1.3	no	49.9	52.5	0.5	no	54.6
28E 3.OG	52.0	53.5	1.5	no	55.6	43.9	49.7	1.3	no	50.3	52.6	0.6	no	54.7	41.8	49.3	0.9	no	49.9	52.4	0.4	no	54.5
28E 4.OG	52.3	53.5	1.5	no	55.6	43.0	50.1	0.9	no	50.7	52.5	0.5	no	54.6	43.4	50.2	1.0	no	50.8	52.6	0.6	no	54.7
28E 5.OG	52.6	53.5	1.5	no	55.6	44.1	50.7	1.1	no	51.3	52.7	0.7	no	54.8	44.7	50.8	1.2	no	51.4	52.7	0.7	no	54.8
28E 6.OG	55.5	55.7	3.7	no	57.8	49.5	52.8	2.7	no	53.4	53.9	1.9	no	56.0	50.3	53.2	3.1	no	53.8	54.2	2.2	no	56.3
28E 7.OG	57.7	57.5	5.5	yes	59.6	52.5	54.7	4.0	no	55.3	55.3	3.3	no	57.4	51.3	54.0	3.3	no	54.6	54.7	2.7	no	56.8
28E 8.OG	58.3	57.9	5.9	yes	60.0	52.5	55.0	3.7	no	55.6	55.3	3.3	no	57.4	51.5	54.4	3.1	no	55.0	54.8	2.8	no	56.9
28W 1.OG	62.7	52.4	0.4	no	54.5	30.9	62.1	0.0	no	62.7	52.0	0.0	no	54.1	37.8	62.1	0.0	no	62.7	52.2	0.2	no	54.3
28W 2.OG	62.8	52.7	0.7	no	54.8	34.2	62.1	0.0	no	62.7	52.1	0.1	no	54.2	40.3	62.1	0.0	no	62.7	52.3	0.3	no	54.4
28W 3.OG	62.0	52.8	0.8	no	54.9	34.7	61.3	0.0	no	61.9	52.1	0.1	no	54.2	39.9	61.3	0.0	no	61.9	52.3	0.3	no	54.4
28W 4.OG	61.2	52.8	0.8	no	54.9	34.4	60.5	0.0	no	61.1	52.1	0.1	no	54.2	40.0	60.5	0.0	no	61.1	52.3	0.3	no	54.4
28W 5.OG	60.7	53.0	1.0	no	55.1	35.9	59.9	0.0	no	60.5	52.1	0.1	no	54.2	41.3	60.0	0.1	no	60.6	52.4	0.4	no	54.5
28W 6.OG	60.0	53.4	1.4	no	55.5	37.3	59.1	0.0	no	59.7	52.1	0.1	no	54.2	43.3	59.2	0.1	no	59.8	52.5	0.5	no	54.6
28W 7.OG	59.7	53.5	1.5	no	55.6	39.1	58.7	0.0	no	59.3	52.2	0.2	no	54.3	43.5	58.8	0.1	no	59.4	52.6	0.6	no	54.7
28W 8.OG	59.0	53.8	1.8	no	55.9	41.2	58.0	0.1	no	58.6	52.3	0.3	no	54.4	44.3	58.1	0.2	no	58.7	52.7	0.7	no	54.8
28N 1.OG	61.4	52.4	0.1	no	54.5	29.6	60.8	0.0	no	61.4	52.3	0.0	no	54.4	34.7	60.8	0.0	no	61.4	52.4	0.1	no	54.5
28N 2.OG	60.5	52.2	0.2	no	54.3	30.3	59.9	0.0	no	60.5	52.0	0.0	no	54.1	35.0	59.9	0.0	no	60.5	52.1	0.1	no	54.2
28N 3.OG	59.3	52.2	0.2	no	54.3	30.4	58.7	0.0	no	59.3	52.0	0.0	no	54.1	35.0	58.7	0.0	no	59.3	52.1	0.1	no	54.2
28N 4.OG	58.3	52.2	0.2	no	54.3	30.6	57.7	0.0	no	58.3	52.0	0.0	no	54.1	35.2	57.7	0.0	no	58.3	52.1	0.1	no	54.2
28N 5.OG	57.6	52.2	0.2	no	54.3	30.8	56.9	0.0	no	57.5	52.0	0.0	no	54.1	35.3	56.9	0.0	no	57.5	52.1	0.1	no	54.2
28N 6.OG	56.9	52.2	0.2	no	54.3	31.9	56.2	0.0	no	56.8	52.0	0.0	no	54.1	36.1	56.2	0.0	no	56.8	52.1	0.1	no	54.2
28N 7.OG	56.4	52.3	0.3	no	54.4	35.3	55.7	0.0	no	56.3	52.1	0.1	no	54.2	38.8	55.8	0.1	no	56.4	52.2	0.2	no	54.3
28N 8.OG	56.4	52.8	0.8	no	54.9	39.8	55.5	0.1	no	56.1	52.3	0.3	no	54.4	42.4	55.6	0.2	no	56.2	52.5	0.5	no	54.6
28S 1.OG	60.8	53.8	1.8	no	55.9	46.0	60.0	0.2	no	60.6	53.0	1.0	no	55.1	42.1	59.9	0.1	no	60.5	52.4	0.4	no	54.5
28S 2.OG	60.6	54.9	2.9	no	57.0	48.4	59.6	0.3	no	60.2	53.6	1.6	no	55.7	46.1	59.5	0.2	no	60.1	53.0	1.0	no	55.1
28S 3.OG	60.5	56.6	4.6	no	58.7	50.4	59.0	0.7	no	59.6	54.3	2.3	no	56.4	49.5	58.8	0.5	no	59.4	53.9	1.9	no	56.0
28S 4.OG	60.7	58.2	6.2	yes	60.3	52.7	58.4	1.3	no	59.0	55.4	3.4	no	57.5	50.6	58.0	0.9	no	58.6	54.4	2.4	no	56.5
28S 5.OG	60.7	58.7	6.7	yes	60.8	53.3	58.1	1.7	no	58.7	55.7	3.7	no	57.8	51.0	57.5	1.1	no	58.1	54.5	2.5	no	56.6
28S 6.OG	55.1	55.8	3.8	no	57.9	47.9	51.0	3.0	no	51.6	53.4	1.4	no	55.5	49.1	51.6	3.6	no	52.2	53.8	1.8	no	55.9
28S 7.OG	58.5	58.5	6.5	yes	60.6	52.5	53.9	5.6	yes	54.5	55.3	3.3	no	57.4	50.8	52.7	4.4	no	53.3	54.5	2.5	no	56.6
28S 8.OG	58.9	58.7	6.7	yes	60.8	52.5	54.3	4.6	no	54.9	55.3	3.3	no	57.4	51.0	53.4	3.7	no	54.0	54.5	2.5	no	56.6
29N 1.OG	61.8	52.2	0.2	no	54.3	30.7	61.2	0.0	no	61.8	52.0	0.0	no	54.1	35.4	61.2	0.0	no	61.8	52.1	0.1	no	54.2
29N 2.OG	62.1	52.2	0.2	no	54.3	31.1	61.5	0.0	no	62.1	52.0	0.0	no	54.1	35.6	61.5	0.0	no	62.1	52.1	0.1	no	54.2
29N 3.OG	61.8	52.3	0.3	no	54.4	33.5	61.2	0.0	no	61.8	52.1	0.1	no	54.2	37.4	61.2	0.0	no	61.8	52.1	0.1	no	54.2
29W 1.OG	63.5	52.5	0.5	no	54.6	30.7	62.9	0.0	no	63.5	52.0	0.0	no	54.1	38.5	62.9	0.0	no	63.5	52.2	0.2	no	54.3
29W 2.OG	63.7	52.6	0.6	no	54.7	30.7	63.0	0.0	no	63.6	52.0	0.0	no	54.1	41.6	63.0	0.0	no	63.6	52.4	0.4	no	54.5
29W 3.OG	63.2	52.8	0.8	no	54.9	33.9	62.5	0.0	no	63.1	52.1	0.1	no	54.2	42.3	62.5	0.0	no	63.1	52.4	0.4	no	54.5
29S 1.OG	58.7	52.3	0.3	no	54.4	32.1	58.0	0.0	no	58.6	52.0	0.0	no	54.1	36.8	58.0	0.0	no	58.6	52.1	0.1	no	54.2
29S 2.OG	59.2	52.5	0.5	no	54.6	34.5	58.5	0.0	no	59.1	52.1	0.1	no	54.2	38.5	58.5	0.0	no	59.1	52.2	0.2	no	54.3
29S 3.OG	59.3	52.9	0.9	no	55.0	38.6	58.5	0.0	no	59.1	52.2	0.2	no	54.3	41.5	58.6	0.1	no	59.2	52.4	0.4	no	54.5
30S 1.OG	59.8	58.1	3.4	no	61.8	54.2	56.1	4.4	no	58.9	57.5	2.8	no	61.2	54.6	56.4	4.7	no	59.2	57.7	3.0	no	61.4
30S 2.OG	63.5	61.3	6.7	yes	65.0	59.0	59.7	8.2	yes	62.5	60.3	5.7	yes	64.0	58.5	59.3	7.8	yes	62.1	60.0	5.4	yes	63.7
30S 3.OG	65.9	63.3	9.4	yes	67.0	60.2	60.7	9.9	yes	63.5	61.1	7.2	yes	64.8	59.8	60.3	9.5	yes	63.1	60.8	6.9	yes	64.5
30N 1.OG	51.9	52.5	0.5	no	56.2	37.7	48.4	0.4	no	51.2	52.2	0.2	no	55.9	42.0	49.0	1.0	no	51.8	52.4	0.4	no	56.1
30N 2.OG	51.9	52.5	0.5	no	56.2	38.4	48.5	0.5	no	51.3	52.2	0.2	no	55.9	42.1	49.0	1.0	no	51.8	52.4	0.4	no	56.1
30N 3.OG	52.5	52.8	0.8	no	56.5	40.5	48.7	0.7	no	51.5	52.3	0.3	no	56.0	43.2	49.2	1.2	no	52.0	52.5	0.5	no	56.2
31N 1.OG	54.6	54.4	0.5	no	58.1	40.3	51.2	0.4	no	54.0	54.1	0.2	no	57.8	51.1	54.0	3.2	no	56.8	55.7	1.8	no	59.4
31N 2.OG	54.7	54.5	0.5	no	58.2	41.4	51.4	0.5	no	54.2	54.2	0.2	no	57.9	54.1	55.8	4.9	no	58.6	57.1	3.1	no	60.8
31N 3.OG	54.8	54.3	0.8	no	58.0	43.4	51.2	0.8	no	54.0	53.9	0.4	no	57.6	54.2	55.7	5.3	yes	58.5	56.9	3.4	no	60.6
31S 1.OG	57.9	56.2	4.2	no	59.9	51.2	52.9	4.9	no	55.7	54.6	2.6	no	58.3	47.4	50.7	2.7	no	53.5	53.3	1.3	no	57.0
31S 2.OG	60.8	58.6	6.6	yes	62.3	55.1	55.9	7.9	yes	58.7	56.8	4.8	no	60.5	52.0	53.5	5.5	yes	56.3	55.0	3.0	no	58.7
31S 3.OG	63.3	60.9	8.9	yes	64.6	58.1	58.5	10.5	yes	61.3	59.1	7.1	yes	62.8	53.4	54.5	6.5	yes	57.3	55.8	3.8	no	59.5
31E 1.OG	52.3	52.6	0.6	no	56.3	39.4	48.6	0.6	no	51.4	52.2	0.2	no	55.9	43.0	49.2	1.2	no	52.0	52.5	0.5	no	56.2
31E 2.OG	56.2	55.0	3.0	no	58.7	46.6	50.4	2.4	no	53.2	53.1	1.1	no	56.8	47.4	50.7	2.7	no	53.5	53.3	1.3	no	57.0
31E 3.OG	57.6	56.0	4.0	no	59.7	49.5	51.8	3.8	no	54.6	53.9	1.9	no	57.6	51.3	53.0	5.0	yes	55.8	54.7	2.7	no	58.4
32N 1.OG	69.1	70.2	0.5	no	73.1	55.3	61.1	1.3	no	67.0	69.9	0.2	no	72.8	58.3	62.1	2.3	no	68.0	70.0	0.3	no	72.9
32N 2.OG	69.1	70.2	0.5	no	73.1	55.5	61.2	1.4	no	67.1	69.9	0.2	no	72.8	58.4	62.2	2.4	no	68.1	70.0	0.3	no	72.9
32N 3.OG	68.7	69.5	0.5	no	72.4	55.3	60.6	1.5	no	66.5	69.2	0.2	no	72.1	58.1	61.6	2.5	no	67.5	69.3	0.3	no	72.2
32N 4.OG	68.7	69.0	0.7	no	71.9	55.9	60.3	1.9	no	66.2	68.5	0.2	no	71.4	58.4	61.4	3.0	no	67.3	68.7	0.4	no	71.6
32S 1.OG	58.6	57.2	0.7	no	60.1	44.0	51.1	0.9	no	57.0	56.7	0.2	no	59.6	47.1	51.9	1.7	no	57.8	57.0	0.5	no	59.9
32S 2.OG	60.9	59.4	0.7	no	62.3	45.6	53.7	0.7	no	59.6	58.9	0.2	no	61.8	48.7	54.4	1.4	no	60.3	59.1	0.4	no	62.0
32S 3.OG	61.2	59.7	0.6	no	62.6	45.4	54.1	0.6	no	60.0	59.3	0.2	no	62.2	48.5	54.7	1.2	no	60.6	59.5	0.4	no	62.4
32S 4.OG	61.3	59.6	0.5	no	62.5	45.2	54.4	0.6	no	60.3	59.3	0.2	no	62.2	48.1	54.8	1.0	no	60.7	59.4	0.3	no	62.3
33S 1.OG	58.2	56.8	4.8	no	53.6	48.5	51.3	3.3	no	53.6	53.6	1.6	no	50.4	51.8	53.3	5.3	yes	55.6	54.9	2.9	no	51.7
33S 2.OG	59.7	58.1	6.0	yes	54.9	51.8	53.3	5.3	yes	55.6	55.0	2.9	no	51.8	54.4	55.3	7.3	yes	57.6	56.4	4.3	no	53.2
33S 3.OG	60.4	58.9	5.9	yes	55.7	52.3	53.7	5.7	yes	56.0	55.7	2.7	no	52.5	55.2	56.0	8.0	yes	58.3	57.2	4.2	no	54.0
33S 4.OG	60.8	59.4	5.9	yes	56.2	52.4	53.7	5.7	yes	56.0	56.0	2.5	no	52.8	56.0	56.6	8.6	yes	58.9	57.9	4.4	no	54.7
33S 5.OG	61.4	60.0	6.3	yes	56.8	52.5	53.8	5.8	yes	56.1	56.2	2.5	no	53.0	56.3	56.9	8.9	yes	59.2	58.2	4.5	no	55.0
33S 6.OG	61.7	60.2	6.4	yes	57.0	52.6	53.9	5.9	yes	56.2	56.3	2.5	no	53.1	56.4	57.0	9.0	yes	59.3	58.3	4.5	no	55.1
33S 7.OG	62.2	60.6	6.7	yes	57.4	52.7	54.0	6.0	yes	56.3	56.4	2.5	no	53.2	56.5	57.1	9.1	yes	59.4	58.4	4.5	no	55.2
33S 8.OG	62.7	61.0	7.1	yes	57.8	53.1	54.3	6.3	yes	56.6	56.5	2.6	no	53.3	56.6	57.2	9.2	yes	59.5	58.5	4.6	no	55.3
33S 9.OG	63.4	61.7	7.8	yes	58.5	53.2	54.3	6.3	yes	56.6	56.6	2.7	no	53.4	56.6	57.2	9.2	yes	59.5	58.5	4.6	no	55.3
33S 10.OG	63.5	61.8	7.9	yes	58.6	53.4	54.5	6.5	yes	56.8	56.7	2.8	no	53.5	56.7	57.2	9.2	yes	59.5	58.5	4.6	no	55.3

					CP-1																	
					Demolition - 6 Month									SOE - 13 Months								
						Weekend				Weekday					Weekend				Weekday			
Receptor Name	ID	Height	Existing weekend Leq adjusted	Existing weekday Leq adjusted	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment
		(m)																				
33S 11.OG	33S	1.5	48.0	53.9	52.9	54.1	6.1	yes	56.4	56.4	2.5	no	53.2	54.0	55.0	7.0	yes	57.3	57.0	3.1	no	53.8
33S 12.OG	33S	4.15	48.0	53.8	52.9	54.1	6.1	yes	56.4	56.4	2.6	no	53.2	54.0	55.0	7.0	yes	57.3	56.9	3.1	no	53.7
33S 13.OG	33S	6.8	48.0	53.8	52.9	54.1	6.1	yes	56.4	56.4	2.6	no	53.2	54.0	55.0	7.0	yes	57.3	56.9	3.1	no	53.7
33S 14.OG	33S	9.45	48.0	53.7	52.9	54.1	6.1	yes	56.4	56.3	2.6	no	53.1	54.0	55.0	7.0	yes	57.3	56.9	3.2	no	53.7
33S 15.OG	33S	12.1	48.0	53.7	52.9	54.1	6.1	yes	56.4	56.3	2.6	no	53.1	54.0	55.0	7.0	yes	57.3	56.9	3.2	no	53.7
33S 16.OG	33S	14.75	48.0	53.6	52.9	54.1	6.1	yes	56.4	56.3	2.7	no	53.1	54.0	55.0	7.0	yes	57.3	56.8	3.2	no	53.6
33S 17.OG	33S	17.4	48.0	53.5	52.8	54.0	6.0	yes	56.3	56.2	2.7	no	53.0	54.0	55.0	7.0	yes	57.3	56.8	3.3	no	53.6
33S 18.OG	33S	20.05	48.0	53.3	52.8	54.0	6.0	yes	56.3	56.1	2.8	no	52.9	54.0	55.0	7.0	yes	57.3	56.7	3.4	no	53.5
33S 19.OG	33S	22.7	48.0	53.2	52.8	54.0	6.0	yes	56.3	56.0	2.8	no	52.8	53.9	54.9	6.9	yes	57.2	56.6	3.4	no	53.4
33S 20.OG	33S	25.35	48.0	53.2	52.7	54.0	6.0	yes	56.3	56.0	2.8	no	52.8	53.9	54.9	6.9	yes	57.2	56.6	3.4	no	53.4
33S 21.OG	33S	28	48.0	53.1	52.7	54.0	6.0	yes	56.3	55.9	2.8	no	52.7	53.9	54.9	6.9	yes	57.2	56.5	3.4	no	53.3
33W 1.OG	33W	30.65	48.0	55.7	49.9	52.1	4.1	no	54.4	56.7	1.0	no	53.5	52.3	53.7	5.7	yes	56.0	57.3	1.6	no	54.1
33W 2.OG	33W	33.3	48.0	56.4	51.2	52.9	4.9	no	55.2	57.5	1.1	no	54.3	54.0	55.0	7.0	yes	57.3	58.4	2.0	no	55.2
33W 3.OG	33W	35.95	48.0	56.5	51.2	52.9	4.9	no	55.2	57.6	1.1	no	54.4	54.1	55.1	7.1	yes	57.4	58.5	2.0	no	55.3
33W 4.OG	33W	38.6	48.0	56.3	51.0	52.8	4.8	no	55.1	57.4	1.1	no	54.2	54.2	55.1	7.1	yes	57.4	58.4	2.1	no	55.2
33W 5.OG	33W	41.25	48.0	55.9	50.7	52.6	4.6	no	54.9	57.0	1.1	no	53.8	54.0	55.0	7.0	yes	57.3	58.1	2.2	no	54.9
33W 6.OG	33W	43.9	48.0	55.5	50.5	52.4	4.4	no	54.7	56.7	1.2	no	53.5	53.8	54.8	6.8	yes	57.1	57.7	2.2	no	54.5
33W 7.OG	33W	46.55	48.0	55.1	50.3	52.3	4.3	no	54.6	56.3	1.2	no	53.1	53.6	54.7	6.7	yes	57.0	57.4	2.3	no	54.2
33W 8.OG	33W	49.2	48.0	54.8	50.7	52.6	4.6	no	54.9	56.2	1.4	no	53.0	53.7	54.7	6.7	yes	57.0	57.3	2.5	no	54.1
33W 9.OG	33W	51.85	48.0	54.5	50.9	52.7	4.7	no	55.0	56.1	1.6	no	52.9	53.7	54.7	6.7	yes	57.0	57.1	2.6	no	53.9
33W 10.OG	33W	54.5	48.0	54.1	51.0	52.8	4.8	no	55.1	55.8	1.7	no	52.6	53.6	54.7	6.7	yes	57.0	56.9	2.8	no	53.7
33W 11.OG	33W	1.5	48.0	53.8	51.3	53.0	5.0	yes	55.3	55.7	1.9	no	52.5	53.7	54.7	6.7	yes	57.0	56.8	3.0	no	53.6
33W 12.OG	33W	4.15	48.0	53.6	51.6	53.2	5.2	yes	55.5	55.7	2.1	no	52.5	53.9	54.9	6.9	yes	57.2	56.8	3.2	no	53.6
33W 13.OG	33W	6.8	48.0	53.4	51.7	53.2	5.2	yes	55.5	55.6	2.2	no	52.4	53.8	54.8	6.8	yes	57.1	56.6	3.2	no	53.4
33W 14.OG	33W	9.45	48.0	53.2	51.7	53.2	5.2	yes	55.5	55.5	2.3	no	52.3	53.7	54.7	6.7	yes	57.0	56.5	3.3	no	53.3
33W 15.OG	33W	12.1	48.0	52.9	51.7	53.2	5.2	yes	55.5	55.4	2.5	no	52.2	53.7	54.7	6.7	yes	57.0	56.3	3.4	no	53.1
33W 16.OG	33W	14.75	48.0	52.6	51.6	53.2	5.2	yes	55.5	55.1	2.5	no	51.9	53.7	54.7	6.7	yes	57.0	56.2	3.6	no	53.0
33W 17.OG	33W	17.4	48.0	52.4	51.5	53.1	5.1	yes	55.4	55.0	2.6	no	51.8	53.7	54.7	6.7	yes	57.0	56.1	3.7	no	52.9
33W 18.OG	33W	20.05	48.0	52.2	51.5	53.1	5.1	yes	55.4	54.9	2.7	no	51.7	53.7	54.7	6.7	yes	57.0	56.0	3.8	no	52.8
33W 19.OG	33W	22.7	48.0	52.0	51.6	53.2	5.2	yes	55.5	54.8	2.8	no	51.6	53.7	54.7	6.7	yes	57.0	55.9	3.9	no	52.7
33W 20.OG	33W	25.35	48.0	52.0	51.6	53.2	5.2	yes	55.5	54.8	2.8	no	51.6	53.6	54.7	6.7	yes	57.0	55.9	3.9	no	52.7
33W 21.OG	33W	28	48.0	52.0	51.6	53.2	5.2	yes	55.5	54.8	2.8	no	51.6	53.5	54.6	6.6	yes	56.9	55.8	3.8	no	52.6
33E 1.OG	33E	30.65	48.0	52.0	35.1	48.2	0.2	no	50.5	52.1	0.1	no	48.9	37.3	48.4	0.4	no	50.7	52.1	0.1	no	48.9
33E 2.OG	33E	33.3	48.0	52.0	38.1	48.4	0.4	no	50.7	52.2	0.2	no	49.0	39.7	48.6	0.6	no	50.9	52.2	0.2	no	49.0
33E 3.OG	33E	35.95	48.0	52.0	39.3	48.5	0.5	no	50.8	52.2	0.2	no	49.0	41.1	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33E 4.OG	33E	38.6	48.0	52.0	39.5	48.6	0.6	no	50.9	52.2	0.2	no	49.0	41.4	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33E 5.OG	33E	41.25	48.0	52.0	39.6	48.6	0.6	no	50.9	52.2	0.2	no	49.0	41.7	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33E 6.OG	33E	43.9	48.0	52.0	39.7	48.6	0.6	no	50.9	52.2	0.2	no	49.0	41.7	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33E 7.OG	33E	46.55	48.0	52.0	40.3	48.7	0.7	no	51.0	52.3	0.3	no	49.1	41.8	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33E 8.OG	33E	49.2	48.0	52.0	40.8	48.8	0.8	no	51.1	52.3	0.3	no	49.1	41.9	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33E 9.OG	33E	51.85	48.0	52.0	40.9	48.8	0.8	no	51.1	52.3	0.3	no	49.1	42.0	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33E 10.OG	33E	54.5	48.0	52.0	41.0	48.8	0.8	no	51.1	52.3	0.3	no	49.1	42.1	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33E 11.OG	33E	1.5	48.0	52.0	41.1	48.8	0.8	no	51.1	52.3	0.3	no	49.1	42.5	49.1	1.1	no	51.4	52.5	0.5	no	49.3
33E 12.OG	33E	4.15	48.0	52.0	41.2	48.8	0.8	no	51.1	52.3	0.3	no	49.1	42.6	49.1	1.1	no	51.4	52.5	0.5	no	49.3
33E 13.OG	33E	6.8	48.0	52.0	41.3	48.8	0.8	no	51.1	52.4	0.4	no	49.2	42.9	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33E 14.OG	33E	9.45	48.0	52.0	41.4	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.0	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33E 15.OG	33E	12.1	48.0	52.0	41.5	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.1	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33E 16.OG	33E	14.75	48.0	52.0	41.5	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.2	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33E 17.OG	33E	17.4	48.0	52.0	41.6	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.2	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33E 18.OG	33E	20.05	48.0	52.0	41.7	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.3	49.3	1.3	no	51.6	52.5	0.5	no	49.3
33E 19.OG	33E	22.7	48.0	52.0	41.7	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.3	49.3	1.3	no	51.6	52.5	0.5	no	49.3
33E 20.OG	33E	25.35	48.0	52.0	41.8	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.4	49.3	1.3	no	51.6	52.6	0.6	no	49.4
33E 21.OG	33E	28	48.0	52.0	42.4	49.1	1.1	no	51.4	52.5	0.5	no	49.3	44.3	49.5	1.5	no	51.8	52.7	0.7	no	49.5
33N 1.OG	33N	30.65	48.0	52.0	36.0	48.3	0.3	no	50.6	52.1	0.1	no	48.9	38.6	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 2.OG	33N	33.3	48.0	52.0	37.0	48.3	0.3	no	50.6	52.1	0.1	no	48.9	39.4	48.6	0.6	no	50.9	52.2	0.2	no	49.0
33N 3.OG	33N	35.95	48.0	52.0	38.0	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.3	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33N 4.OG	33N	38.6	48.0	52.0	38.2	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.5	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33N 5.OG	33N	41.25	48.0	52.0	38.2	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.4	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33N 6.OG	33N	43.9	48.0	52.0	38.1	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.4	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33N 7.OG	33N	46.55	48.0	52.0	37.9	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.2	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33N 8.OG	33N	49.2	48.0	52.0	37.8	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.1	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33N 9.OG	33N	51.85	48.0	52.0	37.6	48.4	0.4	no	50.7	52.2	0.2	no	49.0	39.9	48.6	0.6	no	50.9	52.3	0.3	no	49.1
33N 10.OG	33N	54.5	48.0	52.0	37.5	48.4	0.4	no	50.7	52.2	0.2	no	49.0	39.8	48.6	0.6	no	50.9	52.3	0.3	no	49.1
33N 11.OG	33N	1.5	48.0	52.0	37.3	48.4	0.4	no	50.7	52.1	0.1	no	48.9	39.6	48.6	0.6	no	50.9	52.2	0.2	no	49.0
33N 12.OG	33N	4.3	48.0	52.0	37.1	48.3	0.3	no	50.6	52.1	0.1	no	48.9	39.5	48.6	0.6	no	50.9	52.2	0.2	no	49.0
33N 13.OG	33N	7.1	48.0	52.0	36.9	48.3	0.3	no	50.6	52.1	0.1	no	48.9	39.3	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 14.OG	33N	9.9	48.0	52.0	36.7	48.3	0.3	no	50.6	52.1	0.1	no	48.9	39.2	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 15.OG	33N	12.7	48.0	52.0	36.6	48.3	0.3	no	50.6	52.1	0.1	no	48.9	39.0	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 16.OG	33N	15.5	48.0	52.0	36.4	48.3	0.3	no	50.6	52.1	0.1	no	48.9	38.9	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 17.OG	33N	18.3	48.0	52.0	36.2	48.3	0.3	no	50.6	52.1	0.1	no	48.9	38.7	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 18.OG	33N	1.5	48.0	52.0	36.1	48.3	0.3	no	50.6	52.1	0.1	no	48.9	38.6	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 19.OG	33N	4.3	48.0	52.0	35.9	48.3	0.3	no	50.6	52.1	0.1	no	48.9	38.4	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33N 20.OG	33N	7.1	48.0	52.0	35.8	48.3	0.3	no	50.6	52.1	0.1	no	48.9	38.3	48.4	0.4	no	50.7	52.2	0.2	no	49.0
33N 21.OG	33N	9.9	48.0	52.0	36.5	48.3	0.3	no	50.6	52.1	0.1	no	48.9	39.0	48.5	0.5	no	50.8	52.2	0.2	no	49.0
34N 1.OG	34N	12.7	48.0	52.0	38.3	48.4	0.4	no	50.7	52.2	0.2	no	49.0	41.2	48.8	0.8	no	51.1	52.3	0.3	no	49.1
34N 2.OG	34N	15.5	48.0	52.0	39.5	48.6	0.6	no	50.9	52.2	0.2	no	49.0	41.6	48.9	0.9	no	51.2	52.4	0.4	no	49.2
34N 3.OG	34N	18.3	48.0	52.0	40.2	48.7	0.7	no	51.0	52.3	0.3	no	49.1	42.5	49.1	1.1	no	51.4	52.5	0.5	no	49.3
34N 4.OG	34N	1.5	48.0	52.0	41.0	48.8	0.8	no	51.1	52.3	0.3	no	49.1	43.1	49.2	1.2	no	51.5	52.5	0.5	no	49.3
34N 5.OG	34N	1.5	48.0	52.0	39.9	48.6	0.6	no	50.9	52.3	0.3	no	49.1	42.1	49.0	1.0	no	51.3	52.4	0.4	no	49.2
34N 6.OG	34N	1.5	48.0	52.0	40.2	48.7	0.7	no	51.0	52.3	0.3	no	49.1	42.4	49.1	1.1	no	51.4	52.5	0.5	no	49.3
34N 7.OG	34N	1.5	48.0	52.0	41.8	48.9	0.9	no	51.2	52.4	0.4	no	49.2	44.2	49.5	1.5	no	51.8	52.7	0.7	no	49.5
34S 1.OG	34S	1.5	48.0	57.5	51.1	52.8	4.8	no	55.1	58.4	0.9	no	55.2	52.6	53.9	5.9	yes	56.2	58.7	1.2	no	55.5
34S 2.OG	34S	4.75	48.0	58.3	52.7	54.0	6.0	yes	56.3	59.4	1.1	no	56.2	53.6	54.7	6.7	yes	57.0	59.6	1.3	no	56.4
34S 3.OG	34S	8	48.0	58.5	53.6	54.7	6.7	yes	57.0	59.7	1.2	no	56.5	54.3	55.2	7.2	yes	57.5	59.9	1.4	no	56.7
34S 4.OG	34S	1.5	48.0	58.3	55.1	55.9	7.9	yes	58.2	60.0	1.7	no	56.8	55.6	56.3	8.3	yes	58.6	60.2	1.9	no	57.0
34S 5.OG	34S	4.75	48.0	58.0	55.4	56.1	8.1	yes	58.4	59.9	1.9	no	56.7	56.5	57.1	9.1	yes	59.4	60.3	2.3	no	57.1
34S 6.OG	34S	8	48.0	57.5	55.6	56.3	8.3	yes	58.6	59.7	2.2	no	56.5	56.7	57.2	9.2	yes	59.5	60.1	2.6	no	56.9
34S 7.OG	34S	1.5	48.0	57.3	55.7	56.4	8.4	yes	58.7	59.6	2.3	no	56.4	57.0	57.5	9.5	yes	59.8	60.2	2.9	no	57.0
35W	35W	5.1	53.7	58.5	62.2	62.8	9.1	yes	66.0	63.7	5.2	yes	65.9	68.2	68.4	14.7	yes	71.6	68.6	10.1	yes	70.8
35N	35N	8.7	49.8	56.2	47.5	51.8	2.0	no	55.0	56.7	0.5	no	58.9	51.8	53.9	4.1	no	57.1	57.5	1.3	no	59.7
35E	35E	12.3	58.3	66.1	52.0	59.2	0.9	no	62.4	66.3	0.2	no	68.5	53.6	59.6	1.3	no	62.8	66.3	0.2	no	68.5
35S	35S	1.5	50.3	57.2	52.1	54.3	4.0	no	57.5	58.4	1.2	no	60.6	53.7	55.3	5.0	yes	58.5	58.8	1.6	no	61.0
35P	35P	1	66.1	66.1	52.1	66.3	0.2	no	68.8	66.3	0.2	no	68.8	54.5	66.4	0.3	no	68.9	66.4	0.3	no	68.9
36N 1.OG	36N	5.1	48.0	52.0	58.3	58.7	10.7	yes	61.8	59.2	7.2	yes	59.3	54.8	55.6	7.6	yes	58.7	56.6	4.6	no	56.7
36N 2.OG	36N	8.7	48.0	52.7	60.7	60.9	12.9	yes	64.0	61.3	8.6	yes	61.4	55.9	56.6	8.6	yes	59.7	57.6	4.9	no	57.7
36N 3.OG	36N	12.3	48.0	52.8	61.6	61.8	13.8	yes	64.9	62.1	9.3	yes	62.2	57.3	57.8	9.8	yes	60.9	58.6	5.8	yes	58.7
36W 1.OG	36W	1.5	49.7	55.1	60.1	60.5	10.8	yes	63.6	61.3	6.2	yes	61.4	57.2	57.9	8.2	yes	61.0	59.3	4.2	no	59.4
36W 2.OG	36W	5.1	49.7	55.2	62.5	62.7	13.0	yes	65.8	63.2	8.0	yes	63.3	58.6	59.1	9.4	yes	62.2	60.2	5.0	yes	60.3
36W 3.OG	36W	8.7	49.2	54.8	62.8	63.0	13.8	yes	66.1	63.4	8.6	yes	63.5	58.3	58.8	9.6	yes	61.9	59.9	5.1	yes	60.0
37E 1.OG	37E	12.3	49.4	55.0	54.0	55.3	5.9	yes	58.4	57.5	2.5	no	57.6	55.7	56.6	7.2	yes	59.7	58.4	3.4	no	58.5
37E 2.OG	37E	8.7	49.4	55.0	55.2	56.2	6.8	yes	59.3	58.1	3.1	no	58.2	55.9	56.8	7.4	yes	59.9	58.5	3.5	no	58.6
37E 3.OG	37E	12.3	48.9	54.7	54.7	55.7	6.8	yes	58.8	57.7	3.0	no	57.8	55.4	56.3	7.4	yes	59.4	58.1	3.4	no	58.2
37E 4.OG	37E	1.5	48.5	54.5	54.2	55.2	6.7	yes	58.3	57.4	2.9	no	57.5	55.0	55.9	7.4	yes	59.0	57.8	3.3	no	57.9
37N 1.OG	37N	4.8	48.0	52.0	62.9	63.0	15.0	yes	66.1	63.2	11.2	yes	63.3	52.6	53.9	5.9	yes	57.0	55.3	3.3	no	55.4
37N 2.OG	37N	8.1	48.0	52.0	66.1	66.2	18.2	yes	69.3	66.3	14.3	yes	66.4	56.5	57.1	9.1	yes	60.2	57.8	5.8	yes	57.9
37N 3.OG	37N	11.4	48.0	52.0	66.0	66.1	18.1	yes	69.2	66.2	14.2	yes	66.3	56.8	57.3	9.3	yes	60.4	58.0	6.0	yes	58.1
37N 4.OG	37N	1.5	48.0	52.0	65.8	65.9	17.9	yes	69.0	66.0	14.0	yes	66.1	57.2	57.7	9.7	yes	60.8	58.3	6.3	yes	58.4
37S 1.OG	37S	4.8	48.0	52.0	41.4	48.9	0.9	no	52.0	52.4	0.4	no	52.5	40.8	48.8	0.8	no	51.9	52.3	0.3	no	52.4
37S 2.OG	37S	8.1	48.0	52.0	42.5	49.1	1.1	no	52.2	52.5	0.5	no	52.6	42.3	49.0	1.0	no	52.1	52.4	0.4	no	52.5
37S 3.OG	37S	11.4	48.0	52.0	42.6	49.1	1.1	no	52.2	52.5	0.5	no	52.6	42.6	49.1	1.1	no	52.2	52.5	0.5	no	52.6
37S 4.OG	37S	1.5	48.0	52.0	43.3	49.3	1.3	no	52.4	52.5	0.5	no	52.6	43.5	49.3	1.3	no	52.4	52.6	0.6	no	52.7
37W 3.OG	37W	1.5	48.0	52.0	53.4	54.5	6.5	yes	57.6	55.8	3.8	no	55.9	49.1	51.6	3.6	no	54.7	53.8	1.8	no	53.9
37W 4.OG	37W	1.5	48.0	52.0	58.5	58.9	10.9	yes	62.0	59.4	7.4	yes	59.5	51.9	53.4	5.4	yes	56.5	55.0	3.0	no	55.1
38S 1.OG	38S	4.6	48.0	58.6	39.0	48.5	0.5	no	50.0	58.6	0.0	no	62.1	40.6	48.7	0.7	no	50.2	58.6	0.1	no	62.2
38S 2.OG	38S	7.7	48.0	59.0	41.3	48.8	0.8	no	50.3	59.0	0.1	no	62.6	42.9	49.2	1.2	no	50.7	59.1	0.1	no	62.6
38S 3.OG	38S	10.8	48.0	58.8	42.0	49.0	1.0	no	50.5	58.8	0.1	no	62.4	43.6	49.3	1.3	no	50.8	58.9	0.1	no	62.4
38S 4.OG	38S	13.9	48.0	58.3	43.3	49.3	1.3	no	50.8	58.4	0.1	no	61.9	44.8	49.7	1.7	no	51.2	58.4	0.2	no	62.0
38N 1.OG	38N	17	48.0	52.0	38.3	48.4	0.4	no	49.9	52.2	0.2	no	55.7	38.5	48.5	0.5	no	50.0	52.2	0.2	no	55.7
38N 2.OG	38N	20.1	48.0	52.0	41.6	48.9	0.9	no	50.4	52.4	0.4	no	55.9	41.7	48.9	0.9	no	50.4	52.4	0.4	no	55.9
38N 3.OG	38N	23.2	48.0	52.0	46.2	50.2	2.2	no	51.7	53.0	1.0	no	56.5	46.7	50.4	2.4	no	51.9	53.1	1.1	no	56.6
38N 4.OG	38N	26.3	48.0	52.0	53.5	54.6	6.6	yes	56.1	55.8	3.8	no	59.3	52.2	53.6	5.6	yes	55.1	55.1	3.1	no	58.6
39W	39W	29.4	55.2	56.5	51.0	56.6	1.4	no	59.8	57.6	1.1	no	59.8	52.6	57.1	1.9	no	60.3	58.0	1.5	no	60.2
39S	39S	1.5	53.3	53.4	45.4	54.0	0.7	no	57.2	54.0	0.6	no	56.2	48.2	54.5	1.2	no	57.7	54.5	1.1	no	56.7
40E 3.OG	40E	7.7	48.0	52.0	37.1	48.3	0.3	no	48.8	52.1	0.1	no	53.6	39.2	48.5	0.5	no	49.0	52.2	0.2	no	53.7
40E 4.OG	40E	10.8	48.0	52.0	41.9	49.0	1.0	no	49.5	52.4	0.4	no	53.9	43.8	49.4	1.4	no	49.9	52.6	0.6	no	54.1
40E 5.OG	40E	13.9	48.0	52.1	43.8	49.4	1.4	no	49.9	52.7	0.6	no	54.2	45.7	50.0	2.0	no	50.5	53.0	0.9	no	54.5
40E 6.OG	40E	17	48.0	53.0	44.4	49.6	1.6	no	50.1	53.6	0.6	no	55.1	46.2	50.2	2.2	no	50.7	53.8	0.8	no	55.3
40E 7.OG	40E	20.1	48.0	54.2	45.3	49.9	1.9	no	50.4	54.7	0.5	no	56.2	47.1	50.6	2.6	no	51.1	55.0	0.8	no	56.5
40E 8.OG	40E	23.2	48.0	52.5	44.5	49.6	1.6	no	50.1	53.1	0.6	no	54.6	46.3	50.2	2.2	no	50.7	53.4	0.9	no	54.9
40E 9.OG	40E	26.3	48.0	52.8	44.2	49.5	1.5	no	50.0	53.4	0.6	no	54.9	46.0	50.1	2.1	no	50.6	53.6	0.8	no	55.1

	CP-2																		CP-3								
	Excavation and Remediation - 10 months									Sub-Structure - 24 Months									Install equipment and Conveyance Systems - 2 Months Overlap								
		Weekend				Weekday					Weekend				Weekday					Weekend				Weekday			
Receptor Name	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment
33S 11.OG	61.1	61.3	13.3	yes	63.6	61.9	8.0	yes	58.7	53.4	54.5	6.5	yes	56.8	56.7	2.8	no	53.5	56.8	57.3	9.3	yes	59.6	58.6	4.7	no	55.4
33S 12.OG	61.3	61.5	13.5	yes	63.8	62.0	8.2	yes	58.8	53.6	54.7	6.7	yes	57.0	56.7	2.9	no	53.5	56.8	57.3	9.3	yes	59.6	58.6	4.8	no	55.4
33S 13.OG	61.3	61.5	13.5	yes	63.8	62.0	8.2	yes	58.8	53.9	54.9	6.9	yes	57.2	56.9	3.1	no	53.7	56.8	57.3	9.3	yes	59.6	58.6	4.8	no	55.4
33S 14.OG	61.4	61.6	13.6	yes	63.9	62.1	8.4	yes	58.9	54.1	55.1	7.1	yes	57.4	56.9	3.2	no	53.7	56.8	57.3	9.3	yes	59.6	58.5	4.8	no	55.3
33S 15.OG	61.3	61.5	13.5	yes	63.8	62.0	8.3	yes	58.8	54.1	55.1	7.1	yes	57.4	56.9	3.2	no	53.7	56.7	57.2	9.2	yes	59.5	58.5	4.8	no	55.3
33S 16.OG	61.4	61.6	13.6	yes	63.9	62.1	8.5	yes	58.9	54.4	55.3	7.3	yes	57.6	57.0	3.4	no	53.8	56.7	57.2	9.2	yes	59.5	58.4	4.8	no	55.2
33S 17.OG	61.5	61.7	13.7	yes	64.0	62.1	8.6	yes	58.9	55.0	55.8	7.8	yes	58.1	57.3	3.8	no	54.1	56.7	57.2	9.2	yes	59.5	58.4	4.9	no	55.2
33S 18.OG	61.7	61.9	13.9	yes	64.2	62.3	9.0	yes	59.1	55.5	56.2	8.2	yes	58.5	57.5	4.2	no	54.3	56.6	57.2	9.2	yes	59.5	58.3	5.0	yes	55.1
33S 19.OG	61.8	62.0	14.0	yes	64.3	62.4	9.2	yes	59.2	55.7	56.4	8.4	yes	58.7	57.6	4.4	no	54.4	56.6	57.2	9.2	yes	59.5	58.2	5.0	yes	55.0
33S 20.OG	62.0	62.2	14.2	yes	64.5	62.5	9.3	yes	59.3	55.5	56.2	8.2	yes	58.5	57.5	4.3	no	54.3	56.6	57.2	9.2	yes	59.5	58.2	5.0	yes	55.0
33S 21.OG	61.9	62.1	14.1	yes	64.4	62.4	9.3	yes	59.2	55.5	56.2	8.2	yes	58.5	57.5	4.4	no	54.3	56.6	57.2	9.2	yes	59.5	58.2	5.1	yes	55.0
33W 1.OG	57.4	57.9	9.9	yes	60.2	59.6	3.9	no	56.4	51.5	53.1	5.1	yes	55.4	57.1	1.4	no	53.9	55.6	56.3	8.3	yes	58.6	58.7	3.0	no	55.5
33W 2.OG	58.5	58.9	10.9	yes	61.2	60.6	4.2	no	57.4	52.3	53.7	5.7	yes	56.0	57.8	1.4	no	54.6	57.6	58.1	10.1	yes	60.4	60.1	3.7	no	56.9
33W 3.OG	59.1	59.4	11.4	yes	61.7	61.0	4.5	no	57.8	52.2	53.6	5.6	yes	55.9	57.9	1.4	no	54.7	57.6	58.1	10.1	yes	60.4	60.1	3.6	no	56.9
33W 4.OG	59.0	59.3	11.3	yes	61.6	60.9	4.6	no	57.7	52.0	53.5	5.5	yes	55.8	57.7	1.4	no	54.5	57.5	58.0	10.0	yes	60.3	60.0	3.7	no	56.8
33W 5.OG	58.8	59.1	11.1	yes	61.4	60.6	4.7	no	57.4	51.6	53.2	5.2	yes	55.5	57.3	1.4	no	54.1	57.3	57.8	9.8	yes	60.1	59.7	3.8	no	56.5
33W 6.OG	58.9	59.2	11.2	yes	61.5	60.5	5.0	yes	57.3	51.3	53.0	5.0	yes	55.3	56.9	1.4	no	53.7	57.1	57.6	9.6	yes	59.9	59.4	3.9	no	56.2
33W 7.OG	58.7	59.1	11.1	yes	61.4	60.3	5.2	yes	57.1	50.9	52.7	4.7	no	55.0	56.5	1.4	no	53.3	56.9	57.4	9.4	yes	59.7	59.1	4.0	no	55.9
33W 8.OG	58.8	59.1	11.1	yes	61.4	60.3	5.5	yes	57.1	51.3	53.0	5.0	yes	55.3	56.4	1.6	no	53.2	56.8	57.3	9.3	yes	59.6	58.9	4.1	no	55.7
33W 9.OG	58.7	59.1	11.1	yes	61.4	60.1	5.6	yes	56.9	51.4	53.0	5.0	yes	55.3	56.2	1.7	no	53.0	56.7	57.2	9.2	yes	59.5	58.7	4.2	no	55.5
33W 10.OG	58.7	59.1	11.1	yes	61.4	60.0	5.9	yes	56.8	51.7	53.2	5.2	yes	55.5	56.1	2.0	no	52.9	56.6	57.2	9.2	yes	59.5	58.5	4.4	no	55.3
33W 11.OG	58.7	59.1	11.1	yes	61.4	59.9	6.1	yes	56.7	51.8	53.3	5.3	yes	55.6	55.9	2.1	no	52.7	56.6	57.2	9.2	yes	59.5	58.4	4.6	no	55.2
33W 12.OG	58.8	59.1	11.1	yes	61.4	59.9	6.3	yes	56.7	52.0	53.5	5.5	yes	55.8	55.9	2.3	no	52.7	56.5	57.1	9.1	yes	59.4	58.3	4.7	no	55.1
33W 13.OG	58.9	59.2	11.2	yes	61.5	60.0	6.6	yes	56.8	52.1	53.5	5.5	yes	55.8	55.8	2.4	no	52.6	56.5	57.1	9.1	yes	59.4	58.2	4.8	no	55.0
33W 14.OG	59.0	59.3	11.3	yes	61.6	60.0	6.8	yes	56.8	52.1	53.5	5.5	yes	55.8	55.7	2.5	no	52.5	56.4	57.0	9.0	yes	59.3	58.1	4.9	no	54.9
33W 15.OG	59.1	59.4	11.4	yes	61.7	60.0	7.1	yes	56.8	52.4	53.7	5.7	yes	56.0	55.7	2.8	no	52.5	56.4	57.0	9.0	yes	59.3	58.0	5.1	yes	54.8
33W 16.OG	59.0	59.3	11.3	yes	61.6	59.9	7.3	yes	56.7	53.1	54.3	6.3	yes	56.6	55.9	3.3	no	52.7	56.3	56.9	8.9	yes	59.2	57.8	5.2	yes	54.6
33W 17.OG	59.3	59.6	11.6	yes	61.9	60.1	7.7	yes	56.9	54.0	55.0	7.0	yes	57.3	56.3	3.9	no	53.1	56.2	56.8	8.8	yes	59.1	57.7	5.3	yes	54.5
33W 18.OG	59.9	60.2	12.2	yes	62.5	60.6	8.4	yes	57.4	54.4	55.3	7.3	yes	57.6	56.4	4.2	no	53.2	56.1	56.7	8.7	yes	59.0	57.6	5.4	yes	54.4
33W 19.OG	60.3	60.5	12.5	yes	62.8	60.9	8.9	yes	57.7	54.9	55.7	7.7	yes	58.0	56.7	4.7	no	53.5	56.1	56.7	8.7	yes	59.0	57.5	5.5	yes	54.3
33W 20.OG	60.5	60.7	12.7	yes	63.0	61.1	9.1	yes	57.9	54.9	55.7	7.7	yes	58.0	56.7	4.7	no	53.5	56.0	56.6	8.6	yes	58.9	57.5	5.5	yes	54.3
33W 21.OG	60.8	61.0	13.0	yes	63.3	61.3	9.3	yes	58.1	54.8	55.6	7.6	yes	57.9	56.6	4.6	no	53.4	56.0	56.6	8.6	yes	58.9	57.5	5.5	yes	54.3
33E 1.OG	41.5	48.9	0.9	no	51.2	52.4	0.4	no	49.2	37.4	48.4	0.4	no	50.7	52.1	0.1	no	48.9	39.3	48.5	0.5	no	50.8	52.2	0.2	no	49.0
33E 2.OG	43.5	49.3	1.3	no	51.6	52.6	0.6	no	49.4	40.5	48.7	0.7	no	51.0	52.3	0.3	no	49.1	39.7	48.6	0.6	no	50.9	52.2	0.2	no	49.0
33E 3.OG	43.7	49.4	1.4	no	51.7	52.6	0.6	no	49.4	40.6	48.7	0.7	no	51.0	52.3	0.3	no	49.1	40.0	48.6	0.6	no	50.9	52.3	0.3	no	49.1
33E 4.OG	44.7	49.7	1.7	no	52.0	52.7	0.7	no	49.5	40.8	48.8	0.8	no	51.1	52.3	0.3	no	49.1	40.3	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33E 5.OG	45.2	49.8	1.8	no	52.1	52.8	0.8	no	49.6	40.9	48.8	0.8	no	51.1	52.3	0.3	no	49.1	40.6	48.7	0.7	no	51.0	52.3	0.3	no	49.1
33E 6.OG	46.7	50.4	2.4	no	52.7	53.1	1.1	no	49.9	41.0	48.8	0.8	no	51.1	52.3	0.3	no	49.1	40.9	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33E 7.OG	48.6	51.3	3.3	no	53.6	53.6	1.6	no	50.4	41.2	48.8	0.8	no	51.1	52.3	0.3	no	49.1	41.3	48.8	0.8	no	51.1	52.4	0.4	no	49.2
33E 8.OG	48.7	51.4	3.4	no	53.7	53.7	1.7	no	50.5	41.3	48.8	0.8	no	51.1	52.4	0.4	no	49.2	42.1	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33E 9.OG	48.9	51.5	3.5	no	53.8	53.7	1.7	no	50.5	41.4	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.0	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33E 10.OG	49.3	51.7	3.7	no	54.0	53.9	1.9	no	50.7	41.5	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.4	49.3	1.3	no	51.6	52.6	0.6	no	49.4
33E 11.OG	49.8	52.0	4.0	no	54.3	54.0	2.0	no	50.8	41.7	48.9	0.9	no	51.2	52.4	0.4	no	49.2	44.1	49.5	1.5	no	51.8	52.7	0.7	no	49.5
33E 12.OG	49.9	52.1	4.1	no	54.4	54.1	2.1	no	50.9	41.8	48.9	0.9	no	51.2	52.4	0.4	no	49.2	44.2	49.5	1.5	no	51.8	52.7	0.7	no	49.5
33E 13.OG	50.1	52.2	4.2	no	54.5	54.2	2.2	no	51.0	41.9	49.0	1.0	no	51.3	52.4	0.4	no	49.2	44.4	49.6	1.6	no	51.9	52.7	0.7	no	49.5
33E 14.OG	50.3	52.3	4.3	no	54.6	54.2	2.2	no	51.0	42.0	49.0	1.0	no	51.3	52.4	0.4	no	49.2	44.5	49.6	1.6	no	51.9	52.7	0.7	no	49.5
33E 15.OG	50.3	52.3	4.3	no	54.6	54.2	2.2	no	51.0	42.1	49.0	1.0	no	51.3	52.4	0.4	no	49.2	45.2	49.8	1.8	no	52.1	52.8	0.8	no	49.6
33E 16.OG	50.4	52.4	4.4	no	54.7	54.3	2.3	no	51.1	42.5	49.1	1.1	no	51.4	52.5	0.5	no	49.3	45.3	49.9	1.9	no	52.2	52.8	0.8	no	49.6
33E 17.OG	50.4	52.4	4.4	no	54.7	54.3	2.3	no	51.1	42.9	49.2	1.2	no	51.5	52.5	0.5	no	49.3	45.4	49.9	1.9	no	52.2	52.9	0.9	no	49.7
33E 18.OG	50.5	52.4	4.4	no	54.7	54.3	2.3	no	51.1	43.0	49.2	1.2	no	51.5	52.5	0.5	no	49.3	45.5	49.9	1.9	no	52.2	52.9	0.9	no	49.7
33E 19.OG	50.6	52.5	4.5	no	54.8	54.4	2.4	no	51.2	43.0	49.2	1.2	no	51.5	52.5	0.5	no	49.3	45.9	50.1	2.1	no	52.4	53.0	1.0	no	49.8
33E 20.OG	50.6	52.5	4.5	no	54.8	54.4	2.4	no	51.2	43.1	49.2	1.2	no	51.5	52.5	0.5	no	49.3	45.9	50.1	2.1	no	52.4	53.0	1.0	no	49.8
33E 21.OG	50.9	52.7	4.7	no	55.0	54.5	2.5	no	51.3	43.5	49.3	1.3	no	51.6	52.6	0.6	no	49.4	46.5	50.3	2.3	no	52.6	53.1	1.1	no	49.9
33N 1.OG	42.4	49.1	1.1	no	51.4	52.5	0.5	no	49.3	37.0	48.3	0.3	no	50.6	52.1	0.1	no	48.9	41.1	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33N 2.OG	43.6	49.3	1.3	no	51.6	52.6	0.6	no	49.4	38.2	48.4	0.4	no	50.7	52.2	0.2	no	49.0	42.0	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33N 3.OG	44.6	49.6	1.6	no	51.9	52.7	0.7	no	49.5	39.3	48.5	0.5	no	50.8	52.2	0.2	no	49.0	42.9	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33N 4.OG	44.9	49.7	1.7	no	52.0	52.8	0.8	no	49.6	39.5	48.6	0.6	no	50.9	52.2	0.2	no	49.0	43.2	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33N 5.OG	44.9	49.7	1.7	no	52.0	52.8	0.8	no	49.6	39.5	48.6	0.6	no	50.9	52.2	0.2	no	49.0	43.1	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33N 6.OG	44.8	49.7	1.7	no	52.0	52.8	0.8	no	49.6	39.4	48.6	0.6	no	50.9	52.2	0.2	no	49.0	43.0	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33N 7.OG	44.6	49.6	1.6	no	51.9	52.7	0.7	no	49.5	39.3	48.5	0.5	no	50.8	52.2	0.2	no	49.0	42.9	49.2	1.2	no	51.5	52.5	0.5	no	49.3
33N 8.OG	44.5	49.6	1.6	no	51.9	52.7	0.7	no	49.5	39.1	48.5	0.5	no	50.8	52.2	0.2	no	49.0	42.8	49.1	1.1	no	51.4	52.5	0.5	no	49.3
33N 9.OG	44.3	49.5	1.5	no	51.8	52.7	0.7	no	49.5	38.9	48.5	0.5	no	50.8	52.2	0.2	no	49.0	42.6	49.1	1.1	no	51.4	52.5	0.5	no	49.3
33N 10.OG	44.1	49.5	1.5	no	51.8	52.7	0.7	no	49.5	38.7	48.5	0.5	no	50.8	52.2	0.2	no	49.0	42.4	49.1	1.1	no	51.4	52.5	0.5	no	49.3
33N 11.OG	43.9	49.4	1.4	no	51.7	52.6	0.6	no	49.4	38.5	48.5	0.5	no	50.8	52.2	0.2	no	49.0	42.3	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33N 12.OG	43.7	49.4	1.4	no	51.7	52.6	0.6	no	49.4	38.3	48.4	0.4	no	50.7	52.2	0.2	no	49.0	42.1	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33N 13.OG	43.5	49.3	1.3	no	51.6	52.6	0.6	no	49.4	38.1	48.4	0.4	no	50.7	52.2	0.2	no	49.0	41.9	49.0	1.0	no	51.3	52.4	0.4	no	49.2
33N 14.OG	43.4	49.3	1.3	no	51.6	52.6	0.6	no	49.4	37.9	48.4	0.4	no	50.7	52.2	0.2	no	49.0	41.7	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33N 15.OG	43.2	49.2	1.2	no	51.5	52.5	0.5	no	49.3	37.7	48.4	0.4	no	50.7	52.2	0.2	no	49.0	41.6	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33N 16.OG	43.0	49.2	1.2	no	51.5	52.5	0.5	no	49.3	37.5	48.4	0.4	no	50.7	52.2	0.2	no	49.0	41.4	48.9	0.9	no	51.2	52.4	0.4	no	49.2
33N 17.OG	42.8	49.1	1.1	no	51.4	52.5	0.5	no	49.3	37.3	48.4	0.4	no	50.7	52.1	0.1	no	48.9	41.2	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33N 18.OG	42.6	49.1	1.1	no	51.4	52.5	0.5	no	49.3	37.2	48.3	0.3	no	50.6	52.1	0.1	no	48.9	41.1	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33N 19.OG	42.5	49.1	1.1	no	51.4	52.5	0.5	no	49.3	37.0	48.3	0.3	no	50.6	52.1	0.1	no	48.9	40.9	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33N 20.OG	42.3	49.0	1.0	no	51.3	52.4	0.4	no	49.2	36.8	48.3	0.3	no	50.6	52.1	0.1	no	48.9	40.8	48.8	0.8	no	51.1	52.3	0.3	no	49.1
33N 21.OG	42.6	49.1	1.1	no	51.4	52.5	0.5	no	49.3	37.3	48.4	0.4	no	50.7	52.1	0.1	no	48.9	41.1	48.8	0.8	no	51.1	52.3	0.3	no	49.1
34N 1.OG	44.8	49.7	1.7	no	52.0	52.8	0.8	no	49.6	39.9	48.6	0.6	no	50.9	52.3	0.3	no	49.1	43.4	49.3	1.3	no	51.6	52.6	0.6	no	49.4
34N 2.OG	45.5	49.9	1.9	no	52.2	52.9	0.9	no	49.7	41.6	48.9	0.9	no	51.2	52.4	0.4	no	49.2	43.9	49.4	1.4	no	51.7	52.6	0.6	no	49.4
34N 3.OG	46.2	50.2	2.2	no	52.5	53.0	1.0	no	49.8	42.1	49.0	1.0	no	51.3	52.4	0.4	no	49.2	44.5	49.6	1.6	no	51.9	52.7	0.7	no	49.5
34N 4.OG	47.2	50.6	2.6	no	52.9	53.2	1.2	no	50.0	42.8	49.1	1.1	no	51.4	52.5	0.5	no	49.3	45.3	49.9	1.9	no	52.2	52.8	0.8	no	49.6
34N 5.OG	46.1	50.2	2.2	no	52.5	53.0	1.0	no	49.8	41.8	48.9	0.9	no	51.2	52.4	0.4	no	49.2	44.1	49.5	1.5	no	51.8	52.7	0.7	no	49.5
34N 6.OG	47.0	50.5	2.5	no	52.8	53.2	1.2	no	50.0	42.3	49.0	1.0	no	51.3	52.4	0.4	no	49.2	44.9	49.7	1.7	no	52.0	52.8	0.8	no	49.6
34N 7.OG	48.5	51.3	3.3	no	53.6	53.6	1.6	no	50.4	44.0	49.5	1.5	no	51.8	52.6	0.6	no	49.4	46.1	50.2	2.2	no	52.5	53.0	1.0	no	49.8
34S 1.OG	57.5	58.0	10.0	yes	60.3	60.5	3.0	no	57.3	53.1	54.3	6.3	yes	56.6	58.8	1.3	no	55.6	56.2	56.8	8.8	yes	59.1	59.9	2.4	no	56.7
34S 2.OG	58.6	59.0	11.0	yes	61.3	61.5	3.2	no	58.3	55.2	56.0	8.0	yes	58.3	60.0	1.7	no	56.8	57.8	58.2	10.2	yes	60.5	61.1	2.8	no	57.9
34S 3.OG	59.4	59.7	11.7	yes	62.0	62.0	3.5	no	58.8	55.7	56.4	8.4	yes	58.7	60.3	1.8	no	57.1	58.2	58.6	10.6	yes	60.9	61.4	2.9	no	58.2
34S 4.OG	60.6	60.8	12.8	yes	63.1	62.6	4.3	no	59.4	56.7	57.2	9.2	yes	59.5	60.6	2.3	no	57.4	58.9	59.2	11.2	yes	61.5	61.6	3.3	no	58.4
34S 5.OG	61.0	61.2	13.2	yes	63.5	62.8	4.8	no	59.6	56.7	57.2	9.2	yes	59.5	60.4	2.4	no	57.2	59.1	59.4	11.4	yes	61.7	61.6	3.6	no	58.4
34S 6.OG	61.3	61.5	13.5	yes	63.8	62.8	5.3	yes	59.6	56.5	57.1	9.1	yes	59.4	60.0	2.5	no	56.8	59.1	59.4	11.4	yes	61.7	61.4	3.9	no	58.2
34S 7.OG	61.8	62.0	14.0	yes	64.3	63.1	5.8	yes	59.9	56.8	57.3	9.3	yes	59.6	60.1	2.8	no	56.9	59.1	59.4	11.4	yes	61.7	61.3	4.0	no	58.1
35W	68.5	68.6	14.9	yes	71.8	68.9	10.4	yes	71.1	62.2	62.8	9.1	yes	66.0	63.7	5.2	yes	65.9	68.5	68.6	14.9	yes	71.8	68.9	10.4	yes	71.1
35N	56.0	56.9	7.1	yes	60.1	59.1	2.9	no	61.3	52.0	54.0	4.2	no	57.2	57.6	1.4	no	59.8	51.2	53.6	3.8	no	56.8	57.4	1.2	no	59.6
35E	58.9	61.6	3.3	no	64.8	66.9	0.8	no	69.1	54.4	59.8	1.5	no	63.0	66.4	0.3	no	68.6	56.2	60.4	2.1	no	63.6	66.5	0.4	no	68.7
35S	59.2	59.7	9.4	yes	62.9	61.3	4.1	no	63.5	54.8	56.1	5.8	yes	59.3	59.2	2.0	no	61.4	55.2	56.4	6.1	yes	59.6	59.3	2.1	no	61.5
35P	60.7	67.2	1.1	no	69.7	67.2	1.1	no	69.7	53.7	66.3	0.2	no	68.8	66.3	0.2	no	68.8	57.4	66.6	0.5	no	69.1	66.6	0.5	no	69.1
36N 1.OG	67.1	67.2	19.2	yes	70.3	67.2	15.2	yes	67.3	56.1	56.7	8.7	yes	59.8	57.5	5.5	yes	57.6	59.2	59.5	11.5	yes	62.6	60.0	8.0	yes	60.1
36N 2.OG	70.0	70.0	22.0	yes	73.1	70.1	17.4	yes	70.2	58.0	58.4	10.4	yes	61.5	59.1	6.4	yes	59.2	61.2	61.4	13.4	yes	64.5	61.8	9.1	yes	61.9
36N 3.OG	70.1	70.1	22.1	yes	73.2	70.2	17.4	yes	70.3	58.9	59.2	11.2	yes	62.3	59.9	7.1	yes	60.0	61.6	61.8	13.8	yes	64.9	62.1	9.3	yes	62.2
36W 1.OG	68.0	68.1	18.4	yes	71.2	68.2	13.1	yes	68.3	58.1	58.7	9.0	yes	61.8	59.9	4.8	no	60.0	62.6	62.8	13.1	yes	65.9	63.3	8.2	yes	63.4
36W 2.OG	71.1	71.1	21.4	yes	74.2	71.2	16.0	yes	71.3	59.5	59.9	10.2	yes	63.0	60.9	5.7	yes	61.0	64.8	64.9	15.2	yes	68.0	65.3	10.1	yes	65.4
36W 3.OG	71.1	71.1	21.9	yes	74.2	71.2	16.4	yes	71.3	60.4	60.7	11.5	yes	63.8	61.5	6.7	yes	61.6	64.8	64.9	15.7	yes	68.0	65.2	10.4	yes	65.3
37E 1.OG	62.5	62.7	13.3	yes	65.8	63.2	8.2	yes	63.3	55.6	56.5	7.1	yes	59.6	58.3	3.3	no	58.4	60.4	60.7	11.3	yes	63.8	61.5	6.5	yes	61.6
37E 2.OG	63.7	63.9	14.5	yes	67.0	64.2	9.2	yes	64.3	55.7	56.6	7.2	yes	59.7	58.4	3.4	no	58.5	61.8	62.0	12.6	yes	65.1	62.6	7.6	yes	62.7
37E 3.OG	63.3	63.5	14.6	yes	66.6	63.9	9.2	yes	64.0	55.0	56.0	7.1	yes	59.1	57.9	3.2	no	58.0	61.7	61.9	13.0	yes	65.0	62.5	7.8	yes	62.6
37E 4.OG	63.1	63.2	14.7	yes	66.3	63.7	9.2	yes	63.8	54.3	55.3	6.8	yes	58.4	57.4	2.9	no	57.5	61.5	61.7	13.2	yes	64.8	62.3	7.8	yes	62.4
37N 1.OG	67.0	67.1	19.1	yes	70.2	67.1	15.1	yes	67.2	55.1	55.9	7.9	yes	59.0	56.8	4.8	no	56.9	61.8	62.0	14.0	yes	65.1	62.2	10.2	yes	62.3
37N 2.OG	71.7	71.7	23.7	yes	74.8	71.7	19.7	yes	71.8	59.1	59.4	11.4	yes	62.5	59.9	7.9	yes	60.0	65.4	65.5	17.5	yes	68.6	65.6	13.6	yes	65.7
37N 3.OG	71.8	71.8	23.8	yes	74.9	71.8	19.8	yes	71.9	60.0	60.3	12.3	yes	63.4	60.6	8.6	yes	60.7	65.5	65.6	17.6	yes	68.7	65.7	13.7	yes	65.8
37N 4.OG	71.8	71.8	23.8	yes	74.9	71.8	19.8	yes	71.9	60.1	60.4	12.4	yes	63.5	60.7	8.7	yes	60.8	65.6	65.7	17.7	yes	68.8	65.8	13.8	yes	65.9
37S 1.OG	46.7	50.4	2.4	no	53.5	53.1	1.1	no	53.2	39.4	48.6	0.6	no	51.7	52.2	0.2	no	52.3	44.6	49.6	1.6	no	52.7	52.7	0.7	no	52.8
37S 2.OG	48.1	51.1	3.1	no	54.2	53.5	1.5	no	53.6	41.4	48.9	0.9	no	52.0	52.4	0.4	no	52.5	46.0	50.1	2.1	no	53.2	53.0	1.0	no	53.1
37S 3.OG	48.4	51.2	3.2	no	54.3	53.6	1.6	no	53.7	41.8	48.9	0.9	no	52.0	52.4	0.4	no	52.5	46.2	50.2	2.2	no	53.3	53.0	1.0	no	53.1
37S 4.OG	49.2	51.7	3.7	no	54.8	53.8	1.8	no	53.9	42.7	49.1	1.1	no	52.2	52.5	0.5	no	52.6	46.9	50.5	2.5	no	53.6	53.2	1.2	no	53.3
37W 3.OG	55.9	56.6	8.6	yes	59.7	57.4	5.4	yes	57.5	54.3	55.2	7.2	yes	58.3	56.3	4.3	no	56.4	53.4	54.5	6.5	yes	57.6	55.8	3.8	no	55.9
37W 4.OG	62.1	62.3	14.3	yes	65.4	62.5	10.5	yes	62.6	59.1	59.4	11.4	yes	62.5	59.9	7.9	yes	60.0	58.0	58.4	10.4	yes	61.5	59.0	7.0	yes	59.1
38S 1.OG	45.2	49.8	1.8	no	51.3	58.7	0.2	no	62.3	39.7	48.6	0.6	no	50.1	58.6	0.1	no	62.2	43.2	49.2	1.2	no	50.7	58.7	0.1	no	62.2
38S 2.OG	47.7	50.9	2.9	no	52.4	59.3	0.3	no	62.8	43.3	49.3	1.3	no	50.8	59.1	0.1	no	62.6	45.3	49.9	1.9	no	51.4	59.1	0.2	no	62.7
38S 3.OG	48.3	51.2	3.2	no	52.7	59.1	0.4	no	62.7	43.8	49.4	1.4	no	50.9	58.9	0.1	no	62.4	45.9	50.1	2.1	no	51.6	59.0	0.2	no	62.5
38S 4.OG	49.8	52.0	4.0	no	53.5	58.8	0.6	no	62.4	45.2	49.8	1.8	no	51.3	58.5	0.2	no	62.0	47.0	50.5	2.5	no	52.0	58.6	0.3	no	62.1
38N 1.OG	43.1	49.2	1.2	no	50.7	52.5	0.5	no	56.0	35.1	48.2	0.2	no	49.7	52.1	0.1	no	55.6	40.9	48.8	0.8	no	50.3	52.3	0.3	no	55.8
38N 2.OG	46.2	50.2	2.2	no	51.7	53.0	1.0	no	56.5	38.9	48.5	0.5	no	50.0	52.2	0.2	no	55.7	43.5	49.3	1.3	no	50.8	52.6	0.6	no	56.1
38N 3.OG	51.0	52.8	4.8	no	54.3	54.5	2.5	no	58.0	45.0	49.8	1.8	no	51.3	52.8	0.8	no	56.3	47.4	50.7	2.7	no	52.2	53.3	1.3	no	56.8
38N 4.OG	57.3	57.8	9.8	yes	59.3	58.4	6.4	yes	61.9	51.3	53.0	5.0	yes	54.5	54.7	2.7	no	58.2	54.1	55.1	7.1	yes	56.6	56.2	4.2	no	59.7
39W	60.1	61.3	6.1	yes	64.5	61.7	5.2	yes	63.9	49.0	56.1	0.9	no	59.3	57.2	0.7	no	59.4	48.8	56.1	0.9	no	59.3	57.2	0.7	no	59.4
39S	50.5	55.1	1.8	no	58.3	55.2	1.8	no	57.4	46.4	54.1	0.8	no	57.3	54.2	0.8	no	56.4	46.6	54.1	0.8	no	57.3	54.2	0.8	no	56.4
40E 3.OG	43.8	49.4	1.4	no	49.9	52.6	0.6	no	54.1	38.3	48.4	0.4	no	48.9	52.2	0.2	no	53.7	41.8	48.9	0.9	no	49.4	52.4	0.4	no	53.9
40E 4.OG	48.8	51.4	3.4	no	51.9	53.7	1.7	no	55.2	43.5	49.3	1.3	no	49.8	52.6	0.6	no	54.1	46.6	50.4	2.4	no	50.9	53.1	1.1	no	54.6
40E 5.OG	50.7	52.6	4.6	no	53.1	54.5	2.4	no	56.0	45.5	49.9	1.9	no	50.4	53.0	0.9	no	54.5	48.6	51.3	3.3	no	51.8	53.7	1.6	no	55.2
40E 6.OG	51.3	53.0	5.0	yes	53.5	55.2	2.2	no	56.7	46.1	50.2	2.2	no	50.7	53.8	0.8	no	55.3	49.1	51.6	3.6	no	52.1	54.5	1.5	no	56.0
40E 7.OG	52.3	53.7	5.7	yes	54.2	56.4	2.2	no	57.9	47.0	50.5	2.5	no	51.0	55.0	0.8	no	56.5	50.1	52.2	4.2	no	52.7	55.6	1.4	no	57.1
40E 8.OG	51.5	53.1	5.1	yes	53.6	55.0	2.5	no	56.5	46.2	50.2	2.2	no	50.7	53.4	0.9	no	54.9	49.2	51.7	3.7	no	52.2	54.2	1.7	no	55.7
40E 9.OG	51.1	52.8	4.8	no	53.3	55.0	2.2	no	56.5	45.9	50.1	2.1	no	50.6	53.6	0.8	no	55.1	48.9	51.5	3.5	no	52.0	54.3	1.5	no	55.8

Receptor Name	ID	Height	Existing weekend Leq adjusted	Existing weekday Leq adjusted	CP-1									CP-2																											CP-3								
					Demolition - 6 Month									SOE - 13 Months									Excavation and Remediation - 10 months									Sub-Structure - 24 Months									Install equipment and Conveyance Systems - 2 Months Overlap								
						Weekend				Weekday					Weekend				Weekday					Weekend				Weekday					Weekend				Weekday					Weekend				Weekday			
Receptor Name	ID	Height	Existing weekend Leq adjusted	Existing weekday Leq adjusted	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Construction Leq	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment	Total Leq	Noise Level increment	Impact?	L10 = Existing L10+Noise level increment
		(m)																																															
40E 10.OG	40E	29.4	48.0	53.1	44.4	49.6	1.6	no	50.1	53.6	0.5	no	55.1	46.2	50.2	2.2	no	50.7	53.9	0.8	no	55.4	51.3	53.0	5.0	yes	53.5	55.3	2.2	no	56.8	46.1	50.2	2.2	no	50.7	53.9	0.8	no	55.4	49.1	51.6	3.6	no	52.1	54.6	1.5	no	56.1
40S 1.OG	40S	1.5	48.0	57.0	44.4	49.6	1.6	no	50.1	57.2	0.2	no	58.7	46.1	50.2	2.2	no	50.7	57.3	0.3	no	58.8	51.2	52.9	4.9	no	53.4	58.0	1.0	no	59.5	46.3	50.2	2.2	no	50.7	57.4	0.4	no	58.9	48.8	51.4	3.4	no	51.9	57.6	0.6	no	59.1
40S 2.OG	40S	4.6	49.7	58.7	46.3	51.3	1.6	no	51.8	58.9	0.2	no	60.4	47.9	51.9	2.2	no	52.4	59.0	0.3	no	60.5	53.0	54.7	5.0	yes	55.2	59.7	1.0	no	61.2	48.4	52.1	2.4	no	52.6	59.1	0.4	no	60.6	50.5	53.1	3.4	no	53.6	59.3	0.6	no	60.8
40S 3.OG	40S	7.7	50.4	59.3	47.4	52.2	1.8	no	52.7	59.6	0.3	no	61.1	48.9	52.7	2.3	no	53.2	59.7	0.4	no	61.2	54.0	55.6	5.2	yes	56.1	60.4	1.1	no	61.9	49.5	53.0	2.6	no	53.5	59.7	0.4	no	61.2	51.4	53.9	3.5	no	54.4	60.0	0.7	no	61.5
40S 4.OG	40S	10.8	50.6	59.5	48.5	52.7	2.1	no	53.2	59.8	0.3	no	61.3	49.6	53.1	2.5	no	53.6	59.9	0.4	no	61.4	54.9	56.3	5.7	yes	56.8	60.8	1.3	no	62.3	50.3	53.5	2.9	no	54.0	60.0	0.5	no	61.5	52.3	54.5	3.9	no	55.0	60.3	0.8	no	61.8
40S 5.OG	40S	13.9	50.6	59.5	50.9	53.8	3.2	no	54.3	60.1	0.6	no	61.6	50.7	53.7	3.1	no	54.2	60.0	0.5	no	61.5	56.0	57.1	6.5	yes	57.6	61.1	1.6	no	62.6	51.4	54.0	3.4	no	54.5	60.1	0.6	no	61.6	53.7	55.4	4.8	no	55.9	60.5	1.0	no	62.0
40S 6.OG	40S	17	50.3	59.2	51.5	54.0	3.7	no	54.5	59.9	0.7	no	61.4	50.8	53.6	3.3	no	54.1	59.8	0.6	no	61.3	56.4	57.4	7.1	yes	57.9	61.0	1.8	no	62.5	51.5	54.0	3.7	no	54.5	59.9	0.7	no	61.4	54.3	55.8	5.5	yes	56.3	60.4	1.2	no	61.9
40S 7.OG	40S	20.1	49.8	58.7	51.5	53.7	3.9	no	54.2	59.5	0.8	no	61.0	51.7	53.9	4.1	no	54.4	59.5	0.8	no	61.0	57.2	57.9	8.1	yes	58.4	61.0	2.3	no	62.5	51.3	53.6	3.8	no	54.1	59.4	0.7	no	60.9	54.3	55.6	5.8	yes	56.1	60.0	1.3	no	61.5
40S 8.OG	40S	23.2	49.6	58.5	51.5	53.7	4.1	no	54.2	59.3	0.8	no	60.8	51.7	53.8	4.2	no	54.3	59.3	0.8	no	60.8	57.6	58.2	8.6	yes	58.7	61.1	2.6	no	62.6	52.0	54.0	4.4	no	54.5	59.4	0.9	no	60.9	54.4	55.6	6.0	yes	56.1	59.9	1.4	no	61.4
40S 9.OG	40S	26.3	49.5	58.4	51.5	53.6	4.1	no	54.1	59.2	0.8	no	60.7	52.1	54.0	4.5	no	54.5	59.3	0.9	no	60.8	58.4	58.9	9.4	yes	59.4	61.4	3.0	no	62.9	54.0	55.3	5.8	yes	55.8	59.7	1.3	no	61.2	54.4	55.6	6.1	yes	56.1	59.9	1.5	no	61.4
40S 10.OG	40S	29.4	49.1	57.9	51.5	53.5	4.4	no	54.0	58.8	0.9	no	60.3	52.2	53.9	4.8	no	54.4	58.9	1.0	no	60.4	58.6	59.1	10.0	yes	59.6	61.3	3.4	no	62.8	54.1	55.3	6.2	yes	55.8	59.4	1.5	no	60.9	54.4	55.5	6.4	yes	56.0	59.5	1.6	no	61.0
40W 1.OG	40W	7.7	56.8	65.7	52.6	58.2	1.4	no	58.7	65.9	0.2	no	67.4	54.4	58.8	2.0	no	59.3	66.0	0.3	no	67.5	59.6	61.4	4.6	no	61.9	66.7	1.0	no	68.2	54.4	58.8	2.0	no	59.3	66.0	0.3	no	67.5	57.4	60.1	3.3	no	60.6	66.3	0.6	no	67.8
40W 2.OG	40W	10.8	56.9	65.7	52.8	58.3	1.4	no	58.8	65.9	0.2	no	67.4	54.6	58.9	2.0	no	59.4	66.0	0.3	no	67.5	59.8	61.6	4.7	no	62.1	66.7	1.0	no	68.2	54.7	58.9	2.0	no	59.4	66.0	0.3	no	67.5	57.7	60.3	3.4	no	60.8	66.3	0.6	no	67.8
40W 3.OG	40W	13.9	56.4	65.2	52.7	57.9	1.5	no	58.4	65.4	0.2	no	66.9	54.4	58.5	2.1	no	59.0	65.5	0.3	no	67.0	59.6	61.3	4.9	no	61.8	66.3	1.1	no	67.8	54.6	58.6	2.2	no	59.1	65.6	0.4	no	67.1	57.4	59.9	3.5	no	60.4	65.9	0.7	no	67.4
40W 4.OG	40W	17	55.8	64.5	52.5	57.5	1.7	no	58.0	64.8	0.3	no	66.3	54.1	58.0	2.2	no	58.5	64.9	0.4	no	66.4	59.2	60.8	5.0	yes	61.3	65.6	1.1	no	67.1	54.4	58.2	2.4	no	58.7	64.9	0.4	no	66.4	57.1	59.5	3.7	no	60.0	65.2	0.7	no	66.7
40W 5.OG	40W	20.1	55.3	63.9	53.5	57.5	2.2	no	58.0	64.3	0.4	no	65.8	54.2	57.8	2.5	no	58.3	64.3	0.4	no	65.8	59.4	60.8	5.5	yes	61.3	65.2	1.3	no	66.7	54.6	58.0	2.7	no	58.5	64.4	0.5	no	65.9	57.4	59.5	4.2	no	60.0	64.8	0.9	no	66.3
40W 6.OG	40W	23.2	54.8	63.5	53.7	57.3	2.5	no	57.8	63.9	0.4	no	65.4	54.2	57.5	2.7	no	58.0	64.0	0.5	no	65.5	59.4	60.7	5.9	yes	61.2	64.9	1.4	no	66.4	54.5	57.7	2.9	no	58.2	64.0	0.5	no	65.5	57.4	59.3	4.5	no	59.8	64.5	1.0	no	66.0
40W 7.OG	40W	26.3	54.3	62.9	53.5	56.9	2.6	no	57.4	63.4	0.5	no	64.9	54.4	57.4	3.1	no	57.9	63.5	0.6	no	65.0	59.3	60.5	6.2	yes	61.0	64.5	1.6	no	66.0	54.2	57.3	3.0	no	57.8	63.4	0.5	no	64.9	57.4	59.1	4.8	no	59.6	64.0	1.1	no	65.5
40W 8.OG	40W	29.4	53.9	62.4	53.4	56.7	2.8	no	57.2	62.9	0.5	no	64.4	54.4	57.2	3.3	no	57.7	63.0	0.6	no	64.5	60.0	61.0	7.1	yes	61.5	64.4	2.0	no	65.9	54.9	57.4	3.5	no	57.9	63.1	0.7	no	64.6	57.2	58.9	5.0	yes	59.4	63.5	1.1	no	65.0
40W 9.OG	40W	1.5	53.4	62.0	53.3	56.4	3.0	no	56.9	62.5	0.5	no	64.0	54.4	56.9	3.5	no	57.4	62.7	0.7	no	64.2	60.0	60.9	7.5	yes	61.4	64.1	2.1	no	65.6	55.5	57.6	4.2	no	58.1	62.9	0.9	no	64.4	57.1	58.6	5.2	yes	59.1	63.2	1.2	no	64.7
40W 10.OG	40W	3.4	53.0	61.5	53.2	56.1	3.1	no	56.6	62.1	0.6	no	63.6	54.3	56.7	3.7	no	57.2	62.3	0.8	no	63.8	60.1	60.9	7.9	yes	61.4	63.9	2.4	no	65.4	55.6	57.5	4.5	no	58.0	62.5	1.0	no	64.0	56.9	58.4	5.4	yes	58.9	62.8	1.3	no	64.3
40N 1.OG	40N	5.3	51.3	58.5	50.1	53.8	2.5	no	54.3	59.1	0.6	no	60.6	51.8	54.6	3.3	no	55.1	59.3	0.8	no	60.8	57.0	58.0	6.7	yes	58.5	60.8	2.3	no	62.3	51.8	54.6	3.3	no	55.1	59.3	0.8	no	60.8	55.0	56.5	5.2	yes	57.0	60.1	1.6	no	61.6
40N 2.OG	40N	7.2	52.6	60.0	51.3	55.0	2.4	no	55.5	60.5	0.5	no	62.0	53.0	55.8	3.2	no	56.3	60.8	0.8	no	62.3	58.2	59.3	6.7	yes	59.8	62.2	2.2	no	63.7	53.0	55.8	3.2	no	56.3	60.8	0.8	no	62.3	56.4	57.9	5.3	yes	58.4	61.6	1.6	no	63.1
40N 3.OG	40N	1.5	53.1	60.6	51.6	55.4	2.3	no	55.9	61.1	0.5	no	62.6	53.2	56.2	3.1	no	56.7	61.3	0.7	no	62.8	58.4	59.5	6.4	yes	60.0	62.6	2.0	no	64.1	53.2	56.2	3.1	no	56.7	61.3	0.7	no	62.8	56.7	58.3	5.2	yes	58.8	62.1	1.5	no	63.6
40N 4.OG	40N	3.4	52.9	60.3	51.3	55.2	2.3	no	55.7	60.8	0.5	no	62.3	52.9	55.9	3.0	no	56.4	61.0	0.7	no	62.5	58.1	59.2	6.3	yes	59.7	62.3	2.0	no	63.8	52.9	55.9	3.0	no	56.4	61.0	0.7	no	62.5	56.4	58.0	5.1	yes	58.5	61.8	1.5	no	63.3
40N 5.OG	40N	5.3	52.9	60.4	51.1	55.1	2.2	no	55.6	60.9	0.5	no	62.4	52.7	55.8	2.9	no	56.3	61.1	0.7	no	62.6	57.9	59.1	6.2	yes	59.6	62.3	1.9	no	63.8	52.7	55.8	2.9	no	56.3	61.1	0.7	no	62.6	56.2	57.9	5.0	yes	58.4	61.8	1.4	no	63.3
40N 6.OG	40N	7.2	52.7	60.2	50.8	54.9	2.2	no	55.4	60.7	0.5	no	62.2	52.4	55.6	2.9	no	56.1	60.9	0.7	no	62.4	57.6	58.8	6.1	yes	59.3	62.1	1.9	no	63.6	52.3	55.5	2.8	no	56.0	60.9	0.7	no	62.4	55.9	57.6	4.9	no	58.1	61.6	1.4	no	63.1
40N 7.OG	40N	1.5	52.5	60.1	50.6	54.7	2.2	no	55.2	60.6	0.5	no	62.1	52.1	55.3	2.8	no	55.8	60.7	0.6	no	62.2	57.3	58.5	6.0	yes	59.0	61.9	1.8	no	63.4	52.0	55.3	2.8	no	55.8	60.7	0.6	no	62.2	55.6	57.3	4.8	no	57.8	61.4	1.3	no	62.9
40N 8.OG	40N	4.7	52.3	59.9	50.3	54.4	2.1	no	54.9	60.4	0.5	no	61.9	51.7	55.0	2.7	no	55.5	60.5	0.6	no	62.0	57.0	58.3	6.0	yes	58.8	61.7	1.8	no	63.2	52.1	55.2	2.9	no	55.7	60.6	0.7	no	62.1	55.3	57.1	4.8	no	57.6	61.2	1.3	no	62.7
40N 9.OG	40N	7.9	51.7	59.4	49.6	53.8	2.1	no	54.3	59.8	0.4	no	61.3	50.9	54.3	2.6	no	54.8	60.0	0.6	no	61.5	56.3	57.6	5.9	yes	58.1	61.1	1.7	no	62.6	51.7	54.7	3.0	no	55.2	60.1	0.7	no	61.6	54.6	56.4	4.7	no	56.9	60.6	1.2	no	62.1
40N 10.OG	40N	11.1	51.2	58.8	49.2	53.3	2.1	no	53.8	59.3	0.5	no	60.8	50.5	53.9	2.7	no	54.4	59.4	0.6	no	60.9	55.9	57.2	6.0	yes	57.7	60.6	1.8	no	62.1	51.3	54.3	3.1	no	54.8	59.5	0.7	no	61.0	54.3	56.0	4.8	no	56.5	60.1	1.3	no	61.6
41S 1.OG	41S	14.3	49.9	57.9	37.8	50.2	0.3	no	50.7	57.9	0.0	no	59.4	38.3	50.2	0.3	no	50.7	57.9	0.0	no	59.4	45.0	51.1	1.2	no	51.6	58.1	0.2	no	59.6	37.8	50.2	0.3	no	50.7	57.9	0.0	no	59.4	42.8	50.7	0.8	no	51.2	58.0	0.1	no	59.5
41S 2.OG	41S	17.5	50.3	58.3	38.5	50.6	0.3	no	51.1	58.3	0.0	no	59.8	39.3	50.6	0.3	no	51.1	58.4	0.1	no	59.9	45.9	51.6	1.3	no	52.1	58.5	0.2	no	60.0	39.3	50.6	0.3	no	51.1	58.4	0.1	no	59.9	43.3	51.1	0.8	no	51.6	58.4	0.1	no	59.9
41S 3.OG	41S	20.7	50.3	58.3	39.9	50.7	0.4	no	51.2	58.4	0.1	no	59.9	40.0	50.7	0.4	no	51.2	58.4	0.1	no	59.9	46.6	51.8	1.5	no	52.3	58.6	0.3	no	60.1	39.9	50.7	0.4	no	51.2	58.4	0.1	no	59.9	43.9	51.2	0.9	no	51.7	58.5	0.2	no	60.0
41S 4.OG	41S	23.9	50.2	58.2	41.3	50.7	0.5	no	51.2	58.3	0.1	no	59.8	41.4	50.7	0.5	no	51.2	58.3	0.1	no	59.8	48.1	52.3	2.1	no	52.8	58.6	0.4	no	60.1	40.7	50.7	0.5	no	51.2	58.3	0.1	no	59.8	45.3	51.4	1.2	no	51.9	58.4	0.2	no	59.9
41N 1.OG	41N	1.5	48.0	52.0	30.8	48.1	0.1	no	48.6	52.0	0.0	no	53.5	33.3	48.1	0.1	no	48.6	52.1	0.1	no	53.6	36.6	48.3	0.3	no	48.8	52.1	0.1	no	53.6	30.3	48.1	0.1	no	48.6	52.0	0.0	no	53.5	35.3	48.2	0.2	no	48.7	52.1	0.1	no	53.6
41N 2.OG	41N	4.7	48.0	52.0	31.3	48.1	0.1	no	48.6	52.0	0.0	no	53.5	33.7	48.2	0.2	no	48.7	52.1	0.1	no	53.6	37.2	48.3	0.3	no	48.8	52.1	0.1	no	53.6	31.1	48.1	0.1	no	48.6	52.0	0.0	no	53.5	35.8	48.3	0.3	no	48.8	52.1	0.1	no	53.6
41N 3.OG	41N	7.9	48.0	52.0	32.7	48.1	0.1	no	48.6	52.1	0.1	no	53.6	35.0	48.2	0.2	no	48.7	52.1	0.1	no	53.6	38.5	48.5	0.5	no	49.0	52.2	0.2	no	53.7	33.0	48.1	0.1	no	48.6	52.1	0.1	no	53.6	36.9	48.3	0.3	no	48.8	52.1	0.1	no	53.6
41N 4.OG	41N	11.1	48.0	52.0	35.2	48.2	0.2	no	48.7	52.1	0.1	no	53.6	37.5	48.4	0.4	no	48.9	52.2	0.2	no	53.7	41.0	48.8	0.8	no	49.3	52.3	0.3	no	53.8	35.5	48.2	0.2	no	48.7	52.1	0.1	no	53.6	39.0	48.5	0.5	no	49.0	52.2	0.2	no	53.7
42S 1.OG	42S	14.3	48.0	56.5	36.1	48.3	0.3	no	49.8	56.5	0.0	no	60.0	38.1	48.4	0.4	no	49.9	56.5	0.1	no	60.1	42.7	49.1	1.1	no	50.6	56.6	0.2	no	60.2	37.1	48.3	0.3	no	49.8	56.5	0.1	no	60.1	40.6	48.7	0.7	no	50.2	56.6	0.1	no	60.1
42S 2.OG	42S	17.5	48.0	57.9	37.0	48.3	0.3	no	49.8	57.9	0.0	no	61.4	38.9	48.5	0.5	no	50.0	57.9	0.1	no	61.5	43.6	49.3	1.3	no	50.8	58.0	0.2	no	61.6	38.0	48.4	0.4	no	49.9	57.9	0.0	no	61.4	41.4	48.9	0.9	no	50.4	57.9	0.1	no	61.5
42S 3.OG	42S	20.7	48.0	58.2	37.7	48.4	0.4	no	49.9	58.2	0.0	no	61.7	39.7	48.6	0.6	no	50.1	58.2	0.1	no	61.8	44.2	49.5	1.5	no	51.0	58.3	0.2	no	61.9	38.5	48.5	0.5	no	50.0	58.2	0.0	no	61.7	41.9	49.0	1.0	no	50.5	58.3	0.1	no	61.8
42S 4.OG	42S	23.9	48.0	58.2	38.8	48.5	0.5	no	50.0	58.2	0.1	no	61.8	40.6	48.7	0.7	no	50.2	58.2	0.1	no	61.8	45.0	49.8	1.8	no	51.3	58.4	0.2	no	61.9	39.2	48.5	0.5	no	50.0	58.2	0.1	no	61.8	42.4	49.1	1.1	no	50.6	58.3	0.1	no	61.8
42S 5.OG	42S	1.5	48.0	58.0	40.9	48.8	0.8	no	50.3	58.0	0.1	no	61.6	42.5	49.1	1.1	no	50.6	58.1	0.1	no	61.6	46.6	50.4	2.4	no	51.9	58.3	0.3	no	61.8	41.1	48.8	0.8	no	50.3	58.0	0.1	no	61.6	43.8	49.4	1.4	no	50.9	58.1	0.2	no	61.7
42S 6.OG	42S	4.7	48.0	57.7	41.8	48.9	0.9	no	50.4	57.8	0.1	no	61.3	43.2	49.2	1.2	no	50.7	57.8	0.2	no	61.4	47.4	50.7	2.7	no	52.2	58.0	0.4	no	61.6	42.0	49.0	1.0	no	50.5	57.8	0.1	no	61.3	44.4	49.6	1.6	no	51.1	57.9	0.2	no	61.4
42S 7.OG	42S	7.9	48.0	57.5	42.4	49.1	1.1	no	50.6	57.6	0.1	no	61.1	43.8	49.4	1.4	no	50.9	57.6	0.2	no	61.2	48.2	51.1	3.1	no	52.6	57.9	0.5	no	61.5	43.0	49.2	1.2	no	50.7	57.6	0.2	no	61.2	45.2	49.8	1.8	no	51.3	57.7	0.3	no	61.3
42S 8.OG	42S	11.1	48.0	57.3	43.0	49.2	1.2	no	50.7	57.4	0.2	no	61.0	44.5	49.6	1.6	no	51.1	57.5	0.2	no	61.0	48.9	51.5	3.5	no	53.0	57.8	0.6	no	61.4	43.6	49.3	1.3	no	50.8	57.4	0.2	no	61.0	45.8	50.0	2.0	no	51.5	57.6	0.3	no	61.1
42N 1.OG	42N	1.5	48.0	52.0	42.9	49.2	1.2	no	50.7	52.5	0.5	no	56.0	45.2	49.8	1.8	no	51.3	52.8	0.8	no	56.3	49.7	51.9	3.9	no	53.4	54.0	2.0	no	57.5	45.0	49.8	1.8	no	51.3	52.8	0.8	no	56.3	47.4	50.7	2.7	no	52.2	53.3	1.3	no	56.8
42N 2.OG	42N	4.7	48.0	52.0	45.2	49.8	1.8	no	51.3	52.8	0.8	no	56.3	48.1	51.1	3.1	no	52.6	53.5	1.5	no	57.0	52.0	53.5	5.5	yes	55.0	55.0	3.0	no	58.5	47.5	50.8	2.8	no	52.3	53.3	1.3	no	56.8	49.6	51.9	3.9	no	53.4	54.0	2.0	no	57.5
42N 3.OG	42N	7.9	48.0	52.0	46.7	50.4	2.4	no	51.9	53.1	1.1	no	56.6	49.0	51.5	3.5	no	53.0	53.8	1.8	no	57.3	53.3	54.4	6.4	yes	55.9	55.7	3.7	no	59.2	48.8	51.4	3.4	no	52.9	53.7	1.7	no	57.2	50.9	52.7	4.7	no	54.2	54.5	2.5	no	58.0
42N 4.OG	42N	11.1	48.0	52.0	48.4	51.2	3.2	no	52.7	53.6	1.6	no	57.1	49.7	51.9	3.9	no	53.4	54.0	2.0	no	57.5	54.7	55.5	7.5	yes	57.0	56.6	4.6	no	60.1	50.0	52.1	4.1	no	53.6	54.1	2.1	no	57.6	52.2	53.6	5.6	yes	55.1	55.1	3.1	no	58.6
42N 5.OG	42N	1.5	48.0	52.0	49.4	51.8	3.8	no	53.3	53.9	1.9	no	57.4	50.4	52.4	4.4	no	53.9	54.3	2.3	no	57.8	55.4	56.1	8.1	yes	57.6	57.0	5.0	yes	60.5	51.0	52.8	4.8	no	54.3	54.5	2.5	no	58.0	52.7	54.0	6.0	yes	55.5	55.4	3.4	no	58.9
42N 6.OG	42N	4.7	48.0	52.0	50.2	52.2	4.2	no	53.7	54.2	2.2	no	57.7	50.7	52.6	4.6	no	54.1	54.4	2.4	no	57.9	55.8	56.5	8.5	yes	58.0	57.3	5.3	yes	60.8	51.1	52.8	4.8	no	54.3	54.6	2.6	no	58.1	53.1	54.3	6.3	yes	55.8	55.6	3.6	no	59.1
42N 7.OG	42N	1.5	48.0	52.0	50.4	52.4	4.4	no	53.9	54.3	2.3	no	57.8	50.8	52.6	4.6	no	54.1	54.5	2.5	no	58.0	56.1	56.7	8.7	yes	58.2	57.5	5.5	yes	61.0	51.4	53.0	5.0	yes	54.5	54.7	2.7	no	58.2	53.2	54.3	6.3	yes	55.8	55.7	3.7	no	59.2
42N 8.OG	42N	4.7	48.0	60.2	44.1	49.5	1.5	no	51.0	60.3	0.1	no	63.8	45.9	50.1	2.1	no	51.6	60.3	0.2	no	63.9	50.4	52.4	4.4	no	53.9	60.6	0.4	no	64.1	45.2	49.8	1.8	no	51.3	60.3	0.1	no	63.8	48.1	51.1	3.1	no	52.6	60.4	0.3	no	64.0
43N 1.OG	43N	1.5	48.0	60.2	44.1	49.5	1.5	no	51.0	60.3	0.1	no	63.8	45.9	50.1	2.1	no	51.6	60.3	0.2	no	63.9	50.4	52.4	4.4	no	53.9	60.6	0.4	no	64.1	45.2	49.8	1.8	no	51.3	60.3	0.1	no	63.8	48.1	51.1	3.1	no	52.6	60.4	0.3	no	64.0
43N 2.OG	43N	5	48.7	61.1	46.4	50.7	2.0	no	52.2	61.2	0.1	no	64.7	48.4	51.6	2.9	no	53.1	61.3	0.2	no	64.8	52.5	54.0	5.3	yes	55.5	61.6	0.6	no	65.2	47.6	51.2	2.5	no	52.7	61.2	0.2	no	64.8	50.1	52.5	3.8	no	54.0	61.4	0.3	no	64.9
43N 3.OG	43N	8.5	48.7	61.0	48.2	51.5	2.8	no	53.0	61.2	0.2	no	64.7	50.1	52.5	3.8	no	54.0	61.3	0.3	no	64.8	54.0	55.1	6.4	yes	56.6	61.7	0.8	no	65.3	49.4	52.1	3.4	no	53.6	61.2	0.3	no	64.8	51.2	53.1	4.4	no	54.6	61.4	0.4	no	64.9
43N 4.OG	43N	12	48.4	60.7	49.0	51.7	3.3	no	53.2	60.9	0.3	no	64.5	50.4	52.5	4.1	no	54.0	61.0	0.4	no	64.6	54.9	55.8	7.4	yes	57.3	61.7	1.0	no	65.2	50.4	52.5	4.1	no	54.0	61.0	0.4	no	64.6	51.8	53.4	5.0	yes	54.9	61.2	0.5	no	64.7
43W 1.OG	43W	1.5	51.7	64.2	52.3	55.0	3.3	no	56.5	64.4	0.3	no	68.0	54.1	56.1	4.4	no	57.6	64.6	0.4	no	68.1	59.3	60.0	8.3	yes	61.5	65.4	1.2	no	68.9	54.0	56.0	4.3	no	57.5	64.6	0.4	no	68.1	57.0	58.1	6.4	yes	59.6	64.9	0.8	no	68.5
43W 2.OG	43W	5	51.7	64.3	52.5	55.1	3.4	no	56.6	64.5	0.3	no	68.1	54.3	56.2	4.5	no	57.7	64.7	0.4	no	68.2	59.3	60.0	8.3	yes	61.5	65.5	1.2	no	69.0	54.1	56.1	4.4	no	57.6	64.7	0.4	no	68.2	57.0	58.1	6.4	yes	59.6	65.0	0.7	no	68.5
43W 3.OG	43W	8.5	50.6	63.2	52.5	54.7	4.1	no	56.2	63.5	0.4	no	67.1	54.1	55.7	5.1	yes	57.2	63.7	0.5	no	67.2	58.8	59.4	8.8	yes	60.9	64.5	1.4	no	68.1	53.8	55.5	4.9	no	57.0	63.6	0.5	no	67.2	56.3	57.3	6.7	yes	58.8	64.0	0.8	no	67.5
43W 4.OG	43W	12	50.6	63.2	52.5	54.7	4.1	no	56.2	63.5	0.4	no	67.1	54.1	55.7	5.1	yes	57.2	63.7	0.5	no	67.2	58.8	59.4	8.8	yes	60.9	64.5	1.4	no	68.1	53.8	55.5	4.9	no	57.0	63.6	0.5	no	67.2	56.3	57.3	6.7	yes	58.8	64.0	0.8	no	67.5
44N 1.OG	44N	1.5	48.0	56.5	44.4	49.6	1.6	no	51.1	56.7	0.3	no	60.3	45.7	50.0	2.0	no	51.5	56.8	0.4	no	60.4	51.6	53.2	5.2	yes	54.7	57.7	1.2	no	61.2	46.6	50.4	2.4	no	51.9	56.9	0.4	no	60.4	50.0	52.1	4.1	no	53.6	57.3	0.9	no	60.9
44N 2.OG	44N	5	48.0	57.9	47.4	50.7	2.7	no	52.2	58.2	0.4	no	61.8	48.5	51.3	3.3	no	52.8	58.3	0.5	no	61.9	54.5	55.4	7.4	yes	56.9	59.5	1.7	no	63.1	49.4	51.8	3.8	no	53.3	58.4	0.6	no	62.0	53.0	54.2	6.2	yes	55.7	59.1	1.2	no	62.6
44E 1.OG	44E	8.5	49.2	65.7	51.8	53.7	4.5	no	55.2	65.8	0.2	no	69.4	53.6	54.9	5.7	yes	56.4	65.9	0.3	no	69.5	58.8	59.3	10.1	yes	60.8	66.5	0.8	no	70.0	53.6	54.9	5.7	yes	56.4	65.9	0.3	no	69.5	56.7	57.4	8.2	yes	58.9	66.2	0.5	no	69.7
44E 2.OG	44E	12	49.2	65.7	51.8	53.7	4.5	no	55.2	65.8	0.2	no	69.4	53.6	54.9	5.7	yes	56.4	65.9	0.3	no	69.5	58.8	59.3	10.1	yes	60.8	66.5	0.8	no	70.0	53.6	54.9	5.7	yes	56.4	65.9	0.3	no	69.5	56.7	57.4	8.2	yes	58.9	66.2	0.5	no	69.7
45W 1.OG	45W	1.5	51.9	53.6	32.4	51.9	0.0	no	57.8	53.6	0.0	no	56.5	34.3	52.0	0.1	no	57.9	53.7	0.1	no	56.6	38.0	52.1	0.2	no	58.0	53.7	0.1	no	56.6	32.9	52.0	0.1	no	57.9	53.6	0.0	no	56.5	42.5	52.4	0.5	no	58.3	53.9	0.3	no	56.8
45W 2.OG	45W	4.75	53.0	54.8	35.5	53.1	0.1	no	59.0	54.9	0.1	no	57.8	37.8	53.1	0.1	no	59.0	54.9	0.1	no	57.8	41.0	53.3	0.3	no	59.2	55.0	0.2	no	57.9	36.0	53.1	0.1	no	59.0	54.9	0.1	no	57.8	43.3	53.4	0.4	no	59.3	55.1	0.3	no	58.0
45W 3.OG	45W	8	52.9	54.7	41.1	53.2	0.3	no	59.1	54.9	0.2	no	57.8	43.8	53.4	0.5	no	59.3	55.0	0.3	no	57.9	45.7	53.7	0.8	no	59.6	55.2	0.5	no	58.1	40.3	53.1	0.2	no	59.0	54.9	0.2	no	57.8	45.2	53.6	0.7	no	59.5	55.2	0.5	no	58.1
45W 4.OG	45W	11.25	52.7	54.8	45.6	53.5	0.8	no	59.4	55.3	0.5	no	58.2	47.5	53.8	1.1	no	59.7	55.5	0.7	no	58.4	49.8	54.5	1.8	no	60.4	56.0	1.2	no	58.9	44.6	53.3	0.6	no	59.2	55.2	0.4	no	58.1	48.6	54.1	1.4	no	60.0	55.7	0.9	no	58.6
45S 1.OG	45S	1.5	57.4	61.8	38.4	57.5	0.1	no	63.4	61.8	0.0	no	64.7	40.2	57.5	0.1	no	63.4	61.8	0.0	no	64.7	45.2	57.7	0.3	no	63.6	61.9	0.1	no	64.8	40.0	57.5	0.1	no	63.4	61.8	0.0	no	64.7	45.1	57.6	0.2	no	63.5	61.9	0.1	no	64.8
45S 2.OG	45S	4.75	57.7	63.2	40.3	57.8	0.1	no	63.7	63.2	0.0	no	66.1	42.1	57.8	0.1	no	63.7	63.2	0.0	no	66.1	47.2	58.1	0.4	no	64.0	63.3	0.1	no	66.2	42.0	57.8	0.1	no	63.7	63.2	0.0	no	66.1	46.4	58.0	0.3	no	63.9	63.3	0.1	no	66.2
45S 3.OG	45S	8	57.3	63.5	40.9	57.4	0.1	no	63.3	63.5	0.0	no	66.4	42.7	57.4	0.1	no	63.3	63.5	0.0	no	66.4	47.8	57.8	0.5	no	63.7	63.6	0.1	no	66.5	42.6	57.4	0.1	no	63.3	63.5	0.0	no	66.4	46.9	57.7	0.4	no	63.6	63.6	0.1	no	66.5
45S 4.OG	45S	11.25	56.8	63.4	41.3	56.9	0.1	no	62.8	63.4	0.0	no	66.3	43.1	57.0	0.2	no	62.9	63.4	0.0	no	66.3	48.1	57.3	0.5	no	63.2	63.5	0.1	no	66.4	42.9	57.0	0.2	no	62.9	63.4	0.0	no	66.3	47.1	57.2	0.4	no	63.1	63.5	0.1	no	66.4
45E 1.OG	45E	1.5	61.1	71.8	43.6	61.2	0.1	no	67.1	71.8	0.0	no	74.7	45.4	61.2	0.1	no	67.1	71.8	0.0	no	74.7	50.6	61.5	0.4	no	67.4	71.8	0.0	no	74.7	45.3	61.2	0.1	no	67.1	71.8	0.0	no	74.7	49.1	61.4	0.3	no	67.3	71.8	0.0	no	74.7
45E 2.OG	45E	4.75	61.0	71.6	44.9	61.1	0.1	no	67.0	71.6	0.0	no	74.5	46.7	61.2	0.2	no	67.1	71.6	0.0	no	74.5	51.9	61.5	0.5	no	67.4	71.6	0.0	no	74.5	46.6	61.2	0.2	no	67.1	71.6	0.0	no	74.5	50.2	61.3	0.3	no	67.2	71.6	0.0	no	74.5
45E 3.OG	45E	8	60.4	70.9	45.3	60.5	0.1	no	66.4	70.9	0.0	no	73.8	47.1	60.6	0.2	no	66.5	70.9	0.0	no	73.8	52.2	61.0	0.6	no	66.9	71.0	0.1	no	73.9	47.0	60.6	0.2	no	66.5	70.9	0.0	no	73.8	50.6	60.8	0.4	no	66.7	70.9	0.0	no	73.8
45E 4.OG	45E	11.25	59.7	70.1	45.4	59.9	0.2	no	65.8	70.1	0.0	no	73.0	47.2	59.9	0.2	no	65.8	70.1	0.0	no	73.0	52.4	60.4	0.7	no	66.3	70.2	0.1	no	73.1	47.2	59.9	0.2	no	65.8	70.1	0.0	no	73.0	50.9	60.2	0.5	no	66.1	70.2	0.1	no	73.1
46N 1.OG	35N	1.5	58.4	65.2	41.7	58.5	0.1	no	64.4	65.2	0.0	no	68.1	43.8	58.5	0.1	no	64.4	65.2	0.0	no	68.1	48.4	58.8	0.4	no	64.7	65.3	0.1	no	68.2	43.1	58.5	0.1	no	64.4	65.2	0.0	no	68.1	46.7	58.7	0.3	no	64.6	65.3	0.1	no	68.2
46N 2.OG	35N	5.5	58.7	66.0	42.7	58.8	0.1	no	64.7	66.0	0.0	no	68.9	45.2	58.9	0.2	no	64.8	66.0	0.0	no	68.9	49.4	59.2	0.5	no	65.1	66.1	0.1	no	69.0	44.1	58.8	0.1	no	64.7	66.0	0.0	no	68.9	47.5	59.0	0.3	no	64.9	66.1	0.1	no	69.0
46N 3.OG	35N	9.5	58.3	65.9	43.6	58.4	0.1	no	64.3	65.9	0.0	no	68.8	46.6	58.6	0.3	no	64.5	66.0	0.1	no	68.9	49.9	58.9	0.6	no	64.8	66.0	0.1	no	68.9	44.4	58.5	0.2	no	64.4	65.9	0.0	no	68.8	47.9	58.7	0.4	no	64.6	66.0	0.1	no	68.9
46N 4.OG	35N	1.5	57.8	65.7	45.1	58.0	0.2	no	63.9	65.7	0.0	no	68.6	47.6	58.2	0.4	no	64.1	65.8	0.1	no	68.7	50.9	58.6	0.8	no	64.5	65.8	0.1	no	68.7	45.3	58.0	0.2	no	63.9	65.7	0.0	no	68.6	49.2	58.4	0.6	no	64.3	65.8	0.1	no	68.7
46W 1.OG	35W	5.5	61.5	71.9	52.1	62.0	0.5	no	67.9	71.9	0.0	no	74.8	53.9	62.2	0.7	no	68.1	72.0	0.1	no	74.9	59.1	63.5	2.0	no	69.4	72.1	0.2	no	75.0	53.8	62.2	0.7	no	68.1	72.0	0.1	no	74.9	56.9	62.8	1.3	no	68.7	72.0	0.1	no	74.9
46W 2.OG	35W	9.5	61.4	71.7	51.7	61.8	0.4	no	67.7	71.7	0.0	no	74.6	53.5	62.1	0.7	no	68.0	71.8	0.1	no	74.7	58.6	63.2	1.8	no	69.1	71.9	0.2	no	74.8	53.4	62.0	0.6	no	67.9	71.8	0.1	no	74.7	56.5	62.6	1.2	no	68.5	71.8	0.1	no	74.7
46W 3.OG	35W	1.5	60.7	71.0	50.9	61.1	0.4	no	67.0	71.0	0.0	no	73.9	52.7	61.3	0.6	no	67.2	71.1	0.1	no	74.0	57.8	62.5	1.8	no	68.4	71.2	0.2	no	74.1	52.6	61.3	0.6	no	67.2	71.1	0.1	no	74.0	55.7	61.9	1.2	no	67.8	71.1	0.1	no	74.0
46W 4.OG	35W	5.1	60.1	70.3	50.5	60.6	0.5	no	66.5	70.3	0.0	no	73.2	52.4	60.8	0.7	no	66.7	70.4	0.1	no	73.3	57.2	61.9	1.8	no	67.8	70.5	0.2	no	73.4	52.0	60.7	0.6	no	66.6	70.4	0.1	no	73.3	55.2	61.3	1.2	no	67.2	70.4	0.1	no	73.3
46E 1.OG	46E	8.7	52.6	56.9	32.2	52.6	0.0	no	58.5	56.9	0.0	no	59.8	34.2	52.7	0.1	no	58.6	56.9	0.0	no	59.8	38.7	52.8	0.2	no	58.7	57.0	0.1	no	59.9	33.4	52.7	0.1	no	58.6	56.9	0.0	no	59.8	39.7	52.8	0.2	no	58.7	57.0	0.1	no	59.9
46E 2.OG	46E	12.3	53.3	58.0	34.4	53.4	0.1	no	59.3	58.0	0.0	no	60.9	36.2	53.4	0.1	no	59.3	58.0	0.0	no	60.9	41.1	53.6	0.3	no	59.5	58.1	0.1	no	61.0	35.8	53.4	0.1	no	59.3	58.0	0.0	no	60.9	41.0	53.5	0.2	no	59.4	58.1	0.1	no	61.0
46E 3.OG	46E	1.5	53.3	58.2	35.4	53.4	0.1	no	59.3	58.2	0.0	no	61.1	37.3	53.4	0.1	no	59.3	58.2	0.0	no	61.1	42.2	53.6	0.3	no	59.5	58.3	0.1	no	61.2	37.0	53.4	0.1	no	59.3	58.2	0.0	no	61.1	41.7	53.6	0.3	no	59.5	58.3	0.1	no	61.2
46E 4.OG	46E	5.1	53.2	58.5	37.0	53.3	0.1	no	59.2	58.5	0.0	no	61.4	38.9	53.4	0.2	no	59.3	58.5	0.0	no	61.4	43.7	53.7	0.5	no	59.6	58.6	0.1	no	61.5	38.5	53.3	0.1	no	59.2	58.5	0.0	no	61.4	42.7	53.6	0.4	no	59.5	58.6	0.1	no	61.5
47S 1.OG	47S	8.7	60.2	70.2	53.4	61.0	0.8	no	66.9	70.3	0.1	no	73.2	55.2	61.4	1.2	no	67.3	70.3	0.1	no	73.2	60.4	63.3	3.1	no	69.2	70.6	0.4	no	73.5	55.2	61.4	1.2	no	67.3	70.3	0.1	no	73.2	58.2	62.3	2.1	no	68.2	70.5	0.3	no	73.4
47S 2.OG	47S	12.3	60.4	70.4	53.4	61.2	0.8	no	67.1	70.5	0.1	no	73.4	55.2	61.5	1.1	no	67.4	70.5	0.1	no	73.4	60.4	63.4	3.0	no	69.3	70.8	0.4	no	73.7	55.2	61.5	1.1	no	67.4	70.5	0.1	no	73.4	58.2	62.4	2.0	no	68.3	70.7	0.3	no	73.6
47S 3.OG	47S	1.5	59.8	69.8	52.7	60.6	0.8	no	66.5	69.9	0.1	no	72.8	54.4	60.9	1.1	no	66.8	69.9	0.1	no	72.8	59.7	62.8	3.0	no	68.7	70.2	0.4	no	73.1	54.4	60.9	1.1	no	66.8	69.9	0.1	no	72.8	57.5	61.8	2.0	no	67.7	70.0	0.2	no	72.9
47E 1.OG	47E	1.5	61.8	72.4	53.6	62.4	0.6	no	68.3	72.5	0.1	no	75.4	55.3	62.7	0.9	no	68.6	72.5	0.1	no	75.4	60.6	64.3	2.5	no	70.2	72.7	0.3	no	75.6	55.3	62.7	0.9	no	68.6	72.5	0.1	no	75.4	58.4	63.4	1.6	no	69.3	72.6	0.2	no	75.5
47E 2.OG	47E	1.5	61.4	71.9	53.2	62.0	0.6	no	67.9	72.0	0.1	no	74.9	54.9	62.3	0.9	no	68.2	72.0	0.1	no	74.9	60.2	63.9	2.5	no	69.8	72.2	0.3	no	75.1	54.9	62.3	0.9	no	68.2	72.0	0.1	no	74.9	58.0	63.0	1.6	no	68.9	72.1	0.2	no	75.0
47E 3.OG	47E	1.5	60.5	70.9	52.2	61.1	0.6	no	67.0	71.0	0.1	no	73.9	54.0	61.4	0.9	no	67.3	71.0	0.1	no	73.9	59.2	62.9	2.4	no	68.8	71.2	0.3	no	74.1	54.0	61.4	0.9	no	67.3	71.0	0.1	no	73.9	57.0	62.1	1.6	no	68.0	71.1	0.2	no	74.0
48S 1.OG	48S	1.5	56.6	60.9	33.6	56.6	0.0	no	62.5	60.9	0.0	no	63.8	35.5	56.6	0.0	no	62.5	60.9	0.0	no	63.8	40.2	56.7	0.1	no	62.6	60.9	0.0	no	63.8	35.0	56.6	0.0	no	62.5	60.9	0.0	no	63.8	40.0	56.7	0.1	no	62.6	60.9	0.0	no	63.8
48S 2.OG	48S	1.5	56.8	61.2	34.7	56.8	0.0	no	62.7	61.2	0.0	no	64.1	36.6	56.8	0.0	no	62.7	61.2	0.0	no	64.1	41.5	56.9	0.1	no	62.8	61.2	0.0	no	64.1	36.2	56.8	0.0	no	62.7	61.2	0.0	no	64.1	40.8	56.9	0.1	no	62.8	61.2	0.0	no	64.1
48S 3.OG	48S	1.5	56.3	61.0	36.0	56.3	0.0	no	62.2	61.0	0.0	no	63.9	37.9	56.4	0.1	no	62.3	61.0	0.0	no	63.9	42.9	56.5	0.2	no	62.4	61.1	0.1	no	64.0	37.6	56.4	0.1	no	62.3	61.0	0.0	no	63.9	41.8	56.5	0.2	no	62.4	61.1	0.1	no	64.0
48S 4.OG	48S	1.5	55.8	61.0	38.0	55.9	0.1	no	61.8	61.0	0.0	no	63.9	39.9	55.9	0.1	no	61.8	61.0	0.0	no	63.9	44.8	56.1	0.3	no	62.0	61.1	0.1	no	64.0	39.5	55.9	0.1	no	61.8	61.0	0.0	no	63.9	43.3	56.0	0.2	no	61.9	61.1	0.1	no	64.0
48N 1.OG	48N	1.5	48.0	52.0	33.5	48.2	0.2	no	54.1	52.1	0.1	no	55.0	36.1	48.3	0.3	no	54.2	52.1	0.1	no	55.0	38.2	48.4	0.4	no	54.3	52.2	0.2	no	55.1	32.6	48.1	0.1	no	54.0	52.0	0.0	no	54.9	39.5	48.6	0.6	no	54.5	52.2	0.2	no	55.1
48N 2.OG	48N	1.5	48.0	52.0	36.2	48.3	0.3	no	54.2	52.1	0.1	no	55.0	39.2	48.5	0.5	no	54.4	52.2	0.2	no	55.1	40.8	48.8	0.8	no	54.7	52.3	0.3	no	55.2	35.2	48.2	0.2	no	54.1	52.1	0.1	no	55.0	41.1	48.8	0.8	no	54.7	52.3	0.3	no	55.2
48N 3.OG	48N	1.5	48.0	52.0	39.7	48.6	0.6	no	54.5	52.2	0.2	no	55.1	43.2	49.2	1.2	no	55.1	52.5	0.5	no	55.4	44.0	49.5	1.5	no	55.4	52.6	0.6	no	55.5	38.4	48.5	0.5	no	54.4	52.2	0.2	no	55.1	43.2	49.2	1.2	no	55.1	52.5	0.5	no	55.4
48N 4.OG	48N	1.5	48.0	52.0	43.7	49.4	1.4	no	55.3	52.6	0.6	no	55.5	45.5	49.9	1.9	no	55.8	52.9	0.9	no	55.8	48.1	51.1	3.1	no	57.0	53.5	1.5	no	56.4	42.3	49.0	1.0	no	54.9	52.4	0.4	no	55.3	45.8	50.0	2.0	no	55.9	52.9	0.9	no	55.8
49S 1.OG	49S	4.5	48.0	58.5	44.4	49.6	1.6	no	51.9	58.7	0.2	no	55.5	46.4	50.3	2.3	no	52.6	58.8	0.3	no	55.6	51.2	52.9	4.9	no	55.2	59.2	0.7	no	56.0	46.0	50.1	2.1	no	52.4	58.7	0.2	no	55.5	49.4	51.8	3.8	no	54.1	59.0	0.5	no	55.8
49S 2.OG	49S	7.5	48.0	58.6	45.7	50.0	2.0	no	52.3	58.8	0.2	no	55.6	47.7	50.9	2.9	no	53.2	58.9	0.3	no	55.7	52.6	53.9	5.9	yes	56.2	59.6	1.0	no	56.4	47.3	50.7	2.7	no	53.0	58.9	0.3	no	55.7	50.6	52.5	4.5	no	54.8	59.2	0.6	no	56.0
49S 3.OG	49S	1.5	48.0	58.1	45.8	50.0	2.0	no	52.3	58.3	0.2	no	55.1	47.7	50.9	2.9	no	53.2	58.5	0.4	no	55.3	52.6	53.9	5.9	yes	56.2	59.2	1.1	no	56.0	47.4	50.7	2.7	no	53.0	58.5	0.4	no	55.3	50.8	52.6	4.6	no	54.9	58.8	0.7	no	55.6
49E 1.OG	49E	4.5	48.0	59.3	53.7	54.7	6.7	yes	57.0	60.4	1.1	no	57.2	55.5	56.2	8.2	yes	58.5	60.8	1.5	no	57.6	60.7	60.9	12.9	yes	63.2	63.1	3.8	no	59.9	55.4	56.1	8.1	yes	58.4	60.8	1.5	no	57.6	59.0	59.3	11.3	yes	61.6	62.2	2.9	no	59.0
49E 2.OG	49E	7.5	48.0	58.9	53.0	54.2	6.2	yes	56.5	59.9	1.0	no	56.7	55.0	55.8	7.8	yes	58.1	60.4	1.5	no	57.2	60.2	60.5	12.5	yes	62.8	62.6	3.7	no	59.4	54.7	55.5	7.5	yes	57.8	60.3	1.4	no	57.1	59.5	59.8	11.8	yes	62.1	62.2	3.3	no	59.0
49E 3.OG	49E	7.5	48.0	58.0	52.0	53.5	5.5	yes	55.8	59.0	1.0	no	55.8	54.0	55.0	7.0	yes	57.3	59.5	1.5	no	56.3	59.2	59.5	11.5	yes	61.8	61.7	3.7	no	58.5	53.7	54.7	6.7	yes	57.0	59.4	1.4	no	56.2	58.8	59.1	11.1	yes	61.4	61.4	3.4	no	58.2
49W 3.OG	49W	1.5	48.0	52.0	35.3	48.2	0.2	no	50.5	52.1	0.1	no	48.9	38.2	48.4	0.4	no	50.7	52.2	0.2	no	49.0	40.8	48.8	0.8	no	51.1	52.3	0.3	no	49.1	35.4	48.2	0.2	no	50.5	52.1	0.1	no	48.9	40.9	48.8	0.8	no	51.1	52.3	0.3	no	49.1
49N 1.OG	49N	4.5	48.0	52.0	43.9	49.4	1.4	no	51.7	52.6	0.6	no	49.4	45.9	50.1	2.1	no	52.4	53.0	1.0	no	49.8	50.8	52.6	4.6	no	54.9	54.5	2.5	no	51.3	45.5	49.9	1.9	no	52.2	52.9	0.9	no	49.7	48.8	51.4	3.4	no	53.7	53.7	1.7	no	50.5
49N 2.OG	49N	7.5	48.0	52.0	45.4	49.9	1.9	no	52.2	52.9	0.9	no	49.7	47.3	50.7	2.7	no	53.0	53.3	1.3	no	50.1	52.3	53.7	5.7	yes	56.0	55.2	3.2	no	52.0	47.1	50.6	2.6	no	52.9	53.2	1.2	no	50.0	50.3	52.3	4.3	no	54.6	54.2	2.2	no	51.0
49N 3.OG	49N	1.5	48.0	52.0	45.5	49.9	1.9	no	52.2	52.9	0.9	no	49.7	47.4	50.7	2.7	no	53.0	53.3	1.3	no	50.1	52.4	53.7	5.7	yes	56.0	55.2	3.2	no	52.0	47.2	50.6	2.6	no	52.9	53.2	1.2	no	50.0	50.4	52.4	4.4	no	54.7	54.3	2.3	no	51.1
50S 1.OG	50S	4.5	48.3	60.0	60.9	61.1	12.8	yes	63.4	63.5	3.5	no	60.3	62.8	63.0	14.7	yes	65.3	64.6	4.6	no	61.4	65.1	65.2	16.9	yes	67.5	66.3	6.3	yes	63.1	62.1	62.3	14.0	yes	64.6	64.2	4.2	no	61.0	66.9	67.0	18.7	yes	69.3	67.7	7.7	yes	64.5
50S 2.OG	50S	7.5	48.4	60.2	64.7	64.8	16.4	yes	67.1	66.0	5.8	yes	62.8	65.8	65.9	17.5	yes	68.2	66.9	6.7	yes	63.7	69.5	69.5	21.1	yes	71.8	70.0	9.8	yes	66.8	66.4	66.5	18.1	yes	68.8	67.3	7.1	yes	64.1	70.5	70.5	22.1	yes	72.8	70.9	10.7	yes	67.7
50S 3.OG	50S	10.5	48.0	59.8	65.2	65.3	17.3	yes	67.6	66.3	6.5	yes	63.1	65.7	65.8	17.8	yes	68.1	66.7	6.9	yes	63.5	71.7	71.7	23.7	yes	74.0	72.0	12.2	yes	68.8	66.5	66.6	18.6	yes	68.9	67.3	7.5	yes	64.1	72.0	72.0	24.0	yes	74.3	72.3	12.5	yes	69.1
50S 4.OG	50S	13.5	48.0	59.2	65.0	65.1	17.1	yes	67.4	66.0	6.8	yes	62.8	65.6	65.7	17.7	yes	68.0	66.5	7.3	yes	63.3	71.7	71.7	23.7	yes	74.0	71.9	12.7	yes	68.7	66.7	66.8	18.8	yes	69.1	67.4	8.2	yes	64.2	73.1	73.1	25.1	yes	75.4	73.3	14.1	yes	70.1
50S 5.OG	50S	16.5	48.0	58.7	64.8	64.9	16.9	yes	67.2	65.8	7.1	yes	62.6	65.5	65.6	17.6	yes	67.9	66.3	7.6	yes	63.1	71.9	71.9	23.9	yes	74.2	72.1	13.4	yes	68.9	66.6	66.7	18.7	yes	69.0	67.3	8.6	yes	64.1	72.8	72.8	24.8	yes	75.1	73.0	14.3	yes	69.8
50S 6.OG	50S	19.5	48.0	58.2	64.6	64.7	16.7	yes	67.0	65.5	7.3	yes	62.3	65.3	65.4	17.4	yes	67.7	66.1	7.9	yes	62.9	71.7	71.7	23.7	yes	74.0	71.9	13.7	yes	68.7	66.5	66.6	18.6	yes	68.9	67.1	8.9	yes	63.9	72.6	72.6	24.6	yes	74.9	72.8	14.6	yes	69.6
50S 7.OG	50S	1.5	48.0	57.8	64.3	64.4	16.4	yes	66.7	65.2	7.4	yes	62.0	65.1	65.2	17.2	yes	67.5	65.8	8.0	yes	62.6	71.6	71.6	23.6	yes	73.9	71.8	14.0	yes	68.6	66.4	66.5	18.5	yes	68.8	67.0	9.2	yes	63.8	71.7	71.7	23.7	yes	74.0	71.9	14.1	yes	68.7
50E 1.OG	50E	4.5	48.0	56.3	53.4	54.5	6.5	yes	56.8	58.1	1.8	no	54.9	55.3	56.0	8.0	yes	58.3	58.8	2.5	no	55.6	60.5	60.7	12.7	yes	63.0	61.9	5.6	yes	58.7	55.2	56.0	8.0	yes	58.3	58.8	2.5	no	55.6	60.6	60.8	12.8	yes	63.1	62.0	5.7	yes	58.8
50E 2.OG	50E	7.5	48.0	56.3	53.5	54.6	6.6	yes	56.9	58.1	1.8	no	54.9	56.0	56.6	8.6	yes	58.9	59.2	2.9	no	56.0	60.7	60.9	12.9	yes	63.2	62.0	5.7	yes	58.8	55.0	55.8	7.8	yes	58.1	58.7	2.4	no	55.5	62.0	62.2	14.2	yes	64.5	63.0	6.7	yes	59.8
50E 3.OG	50E	10.5	48.0	56.0	52.8	54.0	6.0	yes	56.3	57.7	1.7	no	54.5	55.4	56.1	8.1	yes	58.4	58.7	2.7	no	55.5	60.2	60.5	12.5	yes	62.8	61.6	5.6	yes	58.4	54.3	55.2	7.2	yes	57.5	58.2	2.2	no	55.0	62.3	62.5	14.5	yes	64.8	63.2	7.2	yes	60.0
50E 4.OG	50E	13.5	48.0	55.8	52.2	53.6	5.6	yes	55.9	57.4	1.6	no	54.2	54.9	55.7	7.7	yes	58.0	58.4	2.6	no	55.2	59.7	60.0	12.0	yes	62.3	61.2	5.4	yes	58.0	53.6	54.7	6.7	yes	57.0	57.8	2.0	no	54.6	62.0	62.2	14.2	yes	64.5	62.9	7.1	yes	59.7
50E 5.OG	50E	16.5	48.0	55.5	51.6	53.2	5.2	yes	55.5	57.0	1.5	no	53.8	54.4	55.3	7.3	yes	57.6	58.0	2.5	no	54.8	59.2	59.5	11.5	yes	61.8	60.7	5.2	yes	57.5	53.1	54.3	6.3	yes	56.6	57.5	2.0	no	54.3	61.8	62.0	14.0	yes	64.3	62.7	7.2	yes	59.5
50E 6.OG	50E	19.5	48.0	55.2	51.2	52.9	4.9	no	55.2	56.7	1.5	no	53.5	54.0	55.0	7.0	yes	57.3	57.7	2.5	no	54.5	58.8	59.1	11.1	yes	61.4	60.4	5.2	yes	57.2	52.6	53.9	5.9	yes	56.2	57.1	1.9	no	53.9	61.7	61.9	13.9	yes	64.2	62.6	7.4	yes	59.4
50E 7.OG	50E	1.5	48.0	55.0	50.9	52.7	4.7	no	55.0	56.4	1.4	no	53.2	53.9	54.9	6.9	yes	57.2	57.5	2.5	no	54.3	58.6	59.0	11.0	yes	61.3	60.2	5.2	yes	57.0	52.3	53.7	5.7	yes	56.0	56.9	1.9	no	53.7	61.5	61.7	13.7	yes	64.0	62.4	7.4	yes	59.2
50N 1.OG	50N	4.5	48.0	57.5	40.3	48.7	0.7	no	51.0	57.6	0.1	no	54.4	42.9	49.2	1.2	no	51.5	57.6	0.1	no	54.4	46.7	50.4	2.4	no	52.7	57.8	0.3	no	54.6	41.4	48.9	0.9	no	51.2	57.6	0.1	no	54.4	46.0	50.1	2.1	no	52.4	57.8	0.3	no	54.6

CP-1

Demolition - 6 Month

Receptor Name	ID	Height	Existing weekend Leq adjusted	Existing weekday Leq adjusted	Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
		(m)											
50N 2.OG	50N	7.5	48.0	57.9	41.5	48.9	0.9	no	51.2	58.0	0.1	no	54.8
50N 3.OG	50N	10.5	48.0	57.6	42.3	49.0	1.0	no	51.3	57.7	0.1	no	54.5
50N 4.OG	50N	13.5	48.0	57.1	42.5	49.1	1.1	no	51.4	57.2	0.1	no	54.0
50N 5.OG	50N	16.5	48.0	56.6	42.4	49.1	1.1	no	51.4	56.8	0.2	no	53.6
50N 6.OG	50N	19.5	48.0	56.1	42.3	49.0	1.0	no	51.3	56.3	0.2	no	53.1
50N 7.OG	50N	10.5	48.0	55.4	42.2	49.0	1.0	no	51.3	55.6	0.2	no	52.4
50W 4.OG	50W	13.5	48.0	52.0	42.9	49.2	1.2	no	51.5	52.5	0.5	no	49.3
50W 5.OG	50W	16.5	48.0	52.0	47.0	50.5	2.5	no	52.8	53.2	1.2	no	50.0
50W 6.OG	50W	19.5	48.0	52.0	47.2	50.6	2.6	no	52.9	53.2	1.2	no	50.0
50W 7.OG	50W	1.5	48.0	52.0	47.7	50.9	2.9	no	53.2	53.4	1.4	no	50.2
51N 1.OG	51N	4.5	51.0	54.1	37.7	51.2	0.2	no	54.0	54.2	0.1	no	57.9
51N 2.OG	51N	7.5	51.1	54.2	39.8	51.4	0.3	no	54.2	54.4	0.2	no	58.1
51N 3.OG	51N	1.5	50.6	53.7	40.7	51.0	0.4	no	53.8	53.9	0.2	no	57.6
52N 1.OG	52N	4.5	51.6	52.0	43.4	52.2	0.6	no	55.4	52.6	0.6	no	54.8
52N 2.OG	52N	7.5	52.1	52.0	46.1	53.1	1.0	no	56.3	53.0	1.0	no	55.2
52N 3.OG	52N	1.5	52.5	52.4	51.4	55.0	2.5	no	58.2	54.9	2.5	no	57.1
52W 1.OG	52W	4.5	48.9	52.0	46.6	50.9	2.0	no	54.1	53.1	1.1	no	55.3
52W 2.OG	52W	7.5	50.0	52.0	51.4	53.8	3.8	no	57.0	54.7	2.7	no	56.9
52W 3.OG	52W	1.5	51.1	52.0	55.1	56.6	5.5	yes	59.8	56.8	4.8	no	59.0
52S 1.OG	52S	4.5	59.5	57.3	48.8	59.9	0.4	no	63.1	57.9	0.6	no	60.1
52S 2.OG	52S	7.5	59.8	57.5	52.9	60.6	0.8	no	63.8	58.8	1.3	no	61.0
52S 3.OG	52S	1.5	59.6	57.2	53.0	60.5	0.9	no	63.7	58.6	1.4	no	60.8
53N 1.OG	53N	4.5	55.1	55.2	36.3	55.2	0.1	no	56.6	55.3	0.1	no	55.8
53N 2.OG	53N	7.5	55.3	55.3	36.4	55.4	0.1	no	56.8	55.4	0.1	no	55.9
53N 3.OG	53N	1.5	55.0	54.8	37.6	55.1	0.1	no	56.5	54.9	0.1	no	55.4
53W 1.OG	53W	4.5	58.8	57.1	47.6	59.1	0.3	no	60.5	57.6	0.5	no	58.1
53W 2.OG	53W	7.5	58.8	57.1	52.1	59.6	0.8	no	61.0	58.3	1.2	no	58.8
53W 3.OG	53W	7.5	58.2	56.5	52.1	59.2	1.0	no	60.6	57.8	1.3	no	58.3
53S 3.OG	53S	9	48.0	52.0	49.1	51.6	3.6	no	53.0	53.8	1.8	no	54.3
53E 3.OG	53E	1.5	48.0	52.0	49.2	51.7	3.7	no	53.1	53.8	1.8	no	54.3
54W 1.OG	54W	4.5	55.8	58.7	34.0	55.8	0.0	no	57.2	58.7	0.0	no	59.2
54W 2.OG	54W	7.5	56.0	58.8	34.6	56.0	0.0	no	57.4	58.8	0.0	no	59.3
54W 3.OG	54W	1.5	55.6	58.3	37.2	55.7	0.1	no	57.1	58.3	0.0	no	58.8
54N 1.OG	54N	4.5	55.7	55.8	34.2	55.7	0.0	no	57.1	55.8	0.0	no	56.3
54N 2.OG	54N	7.5	56.0	56.2	34.6	56.0	0.0	no	57.4	56.2	0.0	no	56.7
54N 3.OG	54N	1.5	55.7	55.8	38.8	55.8	0.1	no	57.2	55.9	0.1	no	56.4
55E 1.OG	55E	4.5	50.2	52.0	52.4	54.4	4.2	no	57.6	55.2	3.2	no	57.4
55E 2.OG	55E	7.5	51.6	52.2	56.2	57.5	5.9	yes	60.7	57.7	5.5	yes	59.9
55E 3.OG	55E	1.5	52.7	53.5	56.4	57.9	5.2	yes	61.1	58.2	4.7	no	60.4
55N 1.OG	55N	4.5	63.5	65.6	36.6	63.5	0.0	no	66.7	65.6	0.0	no	67.8
55N 2.OG	55N	7.5	48.0	53.6	36.9	48.3	0.3	no	51.1	53.7	0.1	no	57.4
55N 3.OG	55N	7.5	62.8	64.9	39.0	62.8	0.0	no	66.0	64.9	0.0	no	67.1
55W 3.OG	55W	1.5	48.0	52.0	46.7	50.4	2.4	no	53.6	53.1	1.1	no	55.3
55S 1.OG	55S	4.5	48.0	52.0	58.2	58.6	10.6	yes	61.8	59.1	7.1	yes	61.3
55S 2.OG	55S	7.5	48.5	52.0	61.3	61.5	13.0	yes	64.7	61.8	9.8	yes	64.0
55S 3.OG	55S	1.5	49.9	52.0	62.0	62.3	12.4	yes	65.5	62.4	10.4	yes	64.6
56E 1.OG	56E	4.5	48.0	52.0	47.1	50.6	2.6	no	52.0	53.2	1.2	no	53.7
56E 2.OG	56E	7.5	48.0	52.0	51.8	53.3	5.3	yes	54.7	54.9	2.9	no	55.4
56E 3.OG	56E	10.5	48.0	52.0	51.9	53.4	5.4	yes	54.8	55.0	3.0	no	55.5
56E 4.OG	56E	13.5	48.0	52.0	51.9	53.4	5.4	yes	54.8	55.0	3.0	no	55.5
56E 5.OG	56E	16.5	48.0	52.0	51.9	53.4	5.4	yes	54.8	55.0	3.0	no	55.5
56E 6.OG	56E	19.5	48.0	52.0	51.9	53.4	5.4	yes	54.8	55.0	3.0	no	55.5
56E 7.OG	56E	22.5	48.0	52.0	51.9	53.4	5.4	yes	54.8	55.0	3.0	no	55.5
56E 8.OG	56E	1	48.0	52.0	51.9	53.4	5.4	yes	54.8	55.0	3.0	no	55.5
56E Canal Par	56E Canal Pa	1.5	48.0	52.0	45.4	49.9	1.9	no	51.3	52.9	0.9	no	53.4
57W 1.OG	57W	4.5	48.0	56.0	62.2	62.4	14.4	yes	64.7	63.1	7.1	yes	59.9
57W 2.OG	57W	7.5	48.0	56.3	65.9	66.0	18.0	yes	68.3	66.4	10.1	yes	63.2
57W 3.OG	57W	1.5	48.0	55.9	65.7	65.8	17.8	yes	68.1	66.1	10.2	yes	62.9
57N 1.OG	57N	4.5	48.0	59.6	52.7	54.0	6.0	yes	56.3	60.4	0.8	no	57.2
57N 2.OG	57N	7.5	48.0	59.6	53.5	54.6	6.6	yes	56.9	60.6	1.0	no	57.4
57N 3.OG	57N	1.5	48.0	59.1	53.1	54.3	6.3	yes	56.6	60.1	1.0	no	56.9
57S 1.OG	57S	4.5	49.6	54.6	56.6	57.4	7.8	yes	60.6	58.7	4.1	no	60.9
57S 2.OG	57S	7.5	50.4	55.6	60.6	61.0	10.6	yes	64.2	61.8	6.2	yes	64.0
57S 3.OG	57S	1.5	50.4	55.9	60.6	61.0	10.6	yes	64.2	61.9	6.0	yes	64.1
57E 1.OG	57E	4.5	48.8	54.1	43.4	49.9	1.1	no	53.1	54.5	0.4	no	56.7
57E 2.OG	57E	7.5	50.9	56.1	45.1	51.9	1.0	no	55.1	56.4	0.3	no	58.6
57E 3.OG	57E	1.5	51.7	57.0	46.7	52.9	1.2	no	56.1	57.4	0.4	no	59.6
58E 1.OG	58E	4.5	48.0	52.0	59.9	60.2	12.2	yes	63.4	60.6	8.6	yes	62.8
58E 2.OG	58E	7.5	48.0	52.0	63.1	63.2	15.2	yes	66.4	63.4	11.4	yes	65.6
58E 3.OG	58E	1.5	48.0	52.0	63.6	63.7	15.7	yes	66.9	63.9	11.9	yes	66.1
58N 1.OG	58N	4.5	54.0	65.3	50.4	55.6	1.6	no	58.8	65.4	0.1	no	67.6
58N 2.OG	58N	7.5	54.0	65.2	55.8	58.0	4.0	no	61.2	65.7	0.5	no	67.9
58N 3.OG	58N	4.5	53.5	64.7	56.0	57.9	4.4	no	61.1	65.2	0.5	no	67.4
58W 2.OG	58W	7.5	48.0	53.2	41.9	49.0	1.0	no	52.2	53.5	0.3	no	55.7
58W 3.OG	58W	1.5	48.0	57.4	45.2	49.8	1.8	no	53.0	57.7	0.3	no	59.9
58S 1.OG	58S	4.5	56.1	67.6	50.3	57.1	1.0	no	60.3	67.7	0.1	no	69.9
58S 2.OG	58S	7.5	55.7	67.1	54.6	58.2	2.5	no	61.4	67.3	0.2	no	69.5
58S 3.OG	58S	1.5	54.9	66.2	55.0	58.0	3.1	no	61.2	66.5	0.3	no	68.7
59W 1.OG	59W	4.5	56.8	60.6	63.3	64.2	7.4	yes	67.4	65.2	4.6	yes	67.4
59W 2.OG	59W	7.5	56.7	60.6	66.1	66.6	9.9	yes	69.8	67.2	6.6	yes	69.4
59W 3.OG	59W	1.5	56.0	60.1	67.0	67.3	11.3	yes	70.5	67.8	7.7	yes	70.0
59N 1.OG	59N	4.5	50.6	57.0	55.6	56.8	6.2	yes	60.0	59.4	2.4	no	61.6
59N 2.OG	59N	7.5	50.9	57.2	59.8	60.3	9.4	yes	63.5	61.7	4.5	no	63.9
59N 3.OG	59N	1.5	50.7	57.0	59.8	60.3	9.6	yes	63.5	61.6	4.6	no	63.8
59E 1.OG	59E	4.5	48.0	52.0	43.0	49.2	1.2	no	52.4	52.5	0.5	no	54.7
59E 2.OG	59E	7.5	48.0	52.0	44.4	49.6	1.6	no	52.8	52.7	0.7	no	54.9
59E 3.OG	59E	1.5	48.0	54.0	56.0	56.6	8.6	yes	59.8	58.1	4.1	no	60.3
59S 1.OG	59S	4.5	50.5	55.3	53.4	55.2	4.7	no	58.4	57.5	2.2	no	59.7
59S 2.OG	59S	7.5	50.7	55.5	53.8	55.5	4.8	no	58.7	57.7	2.2	no	59.9
59S 3.OG	59S	1.5	50.6	55.6	53.7	55.4	4.8	no	58.6	57.8	2.2	no	60.0
60N 1.OG	60N	4.5	55.2	55.1	37.8	55.3	0.1	no	56.7	55.2	0.1	no	55.7
60N 2.OG	60N	7.5	55.3	55.2	38.3	55.4	0.1	no	56.8	55.3	0.1	no	55.8
60N 3.OG	60N	7.5	54.9	54.8	42.0	55.1	0.2	no	56.5	55.0	0.2	no	55.5
60N 3.OG	60N	1.5	54.9	54.8	42.0	55.1	0.2	no	56.5	55.0	0.2	no	55.5
60S 1.OG	60S	4.5	48.0	52.0	54.4	55.3	7.3	yes	56.7	56.4	4.4	no	56.9
60S 2.OG	60S	7.5	48.0	52.0	58.4	58.8	10.8	yes	60.2	59.3	7.3	yes	59.8
60S 3.OG	60S	10.5	48.0	52.0	58.8	59.1	11.1	yes	60.5	59.6	7.6	yes	60.1
61	61	1	48.0	56.3	59.2	59.5	11.5	yes	62.7	61.0	4.7	no	63.2
62	62	1	48.0	52.0	57.7	58.1	10.1	yes	61.3	58.7	6.7	yes	60.9

SOE - 13 Months

Receptor Name	Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
50N 2.OG	43.8	49.4	1.4	no	51.7	58.1	0.2	no	54.9
50N 3.OG	44.6	49.6	1.6	no	51.9	57.8	0.2	no	54.6
50N 4.OG	44.7	49.7	1.7	no	52.0	57.3	0.2	no	54.1
50N 5.OG	44.6	49.6	1.6	no	51.9	56.9	0.3	no	53.7
50N 6.OG	44.6	49.6	1.6	no	51.9	56.4	0.3	no	53.2
50N 7.OG	44.7	49.7	1.7	no	52.0	55.8	0.4	no	52.6
50W 4.OG	43.5	49.3	1.3	no	51.6	52.6	0.6	no	49.4
50W 5.OG	47.4	50.7	2.7	no	53.0	53.3	1.3	no	50.1
50W 6.OG	47.4	50.7	2.7	no	53.0	53.3	1.3	no	50.1
50W 7.OG	48.4	51.2	3.2	no	53.5	53.6	1.6	no	50.4
51N 1.OG	40.4	51.4	0.4	no	54.2	54.3	0.2	no	58.0
51N 2.OG	41.1	51.5	0.4	no	54.3	54.4	0.2	no	58.1
51N 3.OG	42.1	51.2	0.6	no	54.0	54.0	0.3	no	57.7
52N 1.OG	48.2	53.2	1.6	no	56.4	53.5	1.5	no	55.7
52N 2.OG	51.4	54.8	2.7	no	58.0	54.7	2.7	no	56.9
52N 3.OG	54.2	56.4	3.9	no	59.6	56.4	4.0	no	58.6
52W 1.OG	50.0	52.5	3.6	no	55.7	54.1	2.1	no	56.3
52W 2.OG	54.4	55.7	5.7	yes	58.9	56.4	4.4	no	58.6
52W 3.OG	57.2	58.2	7.1	yes	61.4	58.3	6.3	yes	60.5
52S 1.OG	39.8	59.5	0.0	no	62.7	57.4	0.1	no	59.6
52S 2.OG	40.1	59.8	0.0	no	63.0	57.6	0.1	no	59.8
52S 3.OG	42.2	59.7	0.1	no	62.9	57.3	0.1	no	59.5
53N 1.OG	39.6	55.2	0.1	no	56.6	55.3	0.1	no	55.8
53N 2.OG	39.8	55.4	0.1	no	56.8	55.4	0.1	no	55.9
53N 3.OG	41.4	55.2	0.2	no	56.6	55.0	0.2	no	55.5
53W 1.OG	46.3	59.0	0.2	no	60.4	57.4	0.3	no	57.9
53W 2.OG	48.5	59.2	0.4	no	60.6	57.7	0.6	no	58.2
53W 3.OG	48.8	58.7	0.5	no	60.1	57.2	0.7	no	57.7
53S 3.OG	51.6	53.2	5.2	yes	54.6	54.8	2.8	no	55.3
53E 3.OG	53.0	54.2	6.2	yes	55.6	55.5	3.5	no	56.0
54W 1.OG	35.8	55.8	0.0	no	57.2	58.7	0.0	no	59.2
54W 2.OG	36.2	56.0	0.0	no	57.4	58.8	0.0	no	59.3
54W 3.OG	38.6	55.7	0.1	no	57.1	58.3	0.0	no	58.8
54N 1.OG	36.1	55.7	0.0	no	57.1	55.8	0.0	no	56.3
54N 2.OG	36.6	56.0	0.0	no	57.4	56.2	0.0	no	56.7
54N 3.OG	40.8	55.8	0.1	no	57.2	55.9	0.1	no	56.4
55E 1.OG	55.5	56.6	6.4	yes	59.8	57.1	5.1	yes	59.3
55E 2.OG	59.3	60.0	8.4	yes	63.2	60.1	7.9	yes	62.3
55E 3.OG	59.5	60.3	7.6	yes	63.5	60.5	7.0	yes	62.7
55N 1.OG	40.3	63.5	0.0	no	66.7	65.6	0.0	no	67.8
55N 2.OG	40.5	48.7	0.7	no	51.5	53.8	0.2	no	57.5
55N 3.OG	42.8	62.8	0.0	no	66.0	64.9	0.0	no	67.1
55W 3.OG	50.2	52.2	4.2	no	55.4	54.2	2.2	no	56.4
55S 1.OG	61.5	61.7	13.7	yes	64.9	62.0	10.0	yes	64.2
55S 2.OG	64.8	64.9	16.4	yes	68.1	65.0	13.0	yes	67.2
55S 3.OG	64.9	65.0	15.1	yes	68.2	65.1	13.1	yes	67.3
56E 1.OG	46.2	50.2	2.2	no	51.6	53.0	1.0	no	53.5
56E 2.OG	51.0	52.8	4.8	no	54.2	54.5	2.5	no	55.0
56E 3.OG	51.0	52.8	4.8	no	54.2	54.5	2.5	no	55.0
56E 4.OG	51.1	52.8	4.8	no	54.2	54.6	2.6	no	55.1
56E 5.OG	51.1	52.8	4.8	no	54.2	54.6	2.6	no	55.1
56E 6.OG	51.1	52.8	4.8	no	54.2	54.6	2.6	no	55.1
56E 7.OG	51.1	52.8	4.8	no	54.2	54.6	2.6	no	55.1
56E 8.OG	51.1	52.8	4.8	no	54.2	54.6	2.6	no	55.1
56E Canal Par	44.4	49.6	1.6	no	51.0	52.7	0.7	no	53.2
57W 1.OG	66.7	66.8	18.8	yes	69.1	67.1	11.1	yes	63.9
57W 2.OG	69.3	69.3	21.3	yes	71.6	69.5	13.2	yes	66.3
57W 3.OG	70.0	70.0	22.0	yes	72.3	70.2	14.3	yes	67.0
57N 1.OG	54.6	55.5	7.5	yes	57.8	60.8	1.2	no	57.6
57N 2.OG	54.9	55.7	7.7	yes	58.0	60.9	1.3	no	57.7
57N 3.OG	54.6	55.5	7.5	yes	57.8	60.4	1.3	no	57.2
57S 1.OG	63.6	63.8	14.2	yes	67.0	64.1	9.5	yes	66.3
57S 2.OG	66.6	66.7	16.3	yes	69.9	66.9	11.3	yes	69.1
57S 3.OG	66.7	66.8	16.4	yes	70.0	67.0	11.1	yes	69.2
57E 1.OG	46.5	50.8	2.0	no	54.0	54.8	0.7	no	57.0
57E 2.OG	47.7	52.6	1.7	no	55.8	56.7	0.6	no	58.9
57E 3.OG	49.5	53.7	2.0	no	56.9	57.7	0.7	no	59.9
58E 1.OG	58.9	59.2	11.2	yes	62.4	59.7	7.7	yes	61.9
58E 2.OG	61.8	62.0	14.0	yes	65.2	62.2	10.2	yes	64.4
58E 3.OG	62.6	62.7	14.7	yes	65.9	63.0	11.0	yes	65.2
58N 1.OG	55.8	58.0	4.0	no	61.2	65.8	0.5	no	68.0
58N 2.OG	59.5	60.6	6.6	yes	63.8	66.2	1.0	no	68.4
58N 3.OG	60.3	61.1	7.6	yes	64.3	66.0	1.3	no	68.2
58W 2.OG	43.5	49.3	1.3	no	52.5	53.6	0.4	no	55.8
58W 3.OG	47.2	50.6	2.6	no	53.8	57.8	0.4	no	60.0
58S 1.OG	41.5	56.2	0.1	no	59.4	67.6	0.0	no	69.8
58S 2.OG	43.0	55.9	0.2	no	59.1	67.1	0.0	no	69.3
58S 3.OG	46.9	55.5	0.6	no	58.7	66.3	0.1	no	68.5
59W 1.OG	59.1	61.1	4.3	no	64.3	62.9	2.3	no	65.1
59W 2.OG	61.3	62.6	5.9	yes	65.8	64.0	3.4	no	66.2
59W 3.OG	61.3	62.4	6.4	yes	65.6	63.8	3.7	no	66.0
59N 1.OG	57.9	58.6	8.0	yes	61.8	60.5	3.5	no	62.7
59N 2.OG	61.6	62.0	11.1	yes	65.2	62.9	5.7	yes	65.1
59N 3.OG	61.7	62.0	11.3	yes	65.2	63.0	6.0	yes	65.2
59E 1.OG	44.5	49.6	1.6	no	52.8	52.7	0.7	no	54.9
59E 2.OG	45.8	50.0	2.0	no	53.2	52.9	0.9	no	55.1
59E 3.OG	56.7	57.2	9.2	yes	60.4	58.6	4.6	no	60.8
59S 1.OG	55.0	56.3	5.8	yes	59.5	58.2	2.9	no	60.4
59S 2.OG	55.0	56.4	5.7	yes	59.6	58.3	2.8	no	60.5
59S 3.OG	54.7	56.1	5.5	yes	59.3	58.2	2.6	no	60.4
60N 1.OG	39.9	55.3	0.1	no	56.7	55.2	0.1	no	55.7
60N 2.OG	40.5	55.4	0.1	no	56.8	55.3	0.1	no	55.8
60N 3.OG	43.7	55.2	0.3	no	56.6	55.1	0.3	no	55.6
60N 3.OG	43.7	55.2	0.3	no	56.6	55.1	0.3	no	55.6
60S 1.OG	53.4	54.5	6.5	yes	55.9	55.8	3.8	no	56.3
60S 2.OG	57.0	57.5	9.5	yes	58.9	58.2	6.2	yes	58.7
60S 3.OG	57.5	58.0	10.0	yes	59.4	58.6	6.6	yes	59.1
61	56.2	56.8	8.8	yes	60.0	59.3	3.0	no	61.5
62	60.0	60.3	12.3	yes	63.5	60.6	8.6	yes	62.8

CP-2

Excavation and Remediation - 10 months

Receptor Name	Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
50N 2.OG	48.0	51.0	3.0	no	53.3	58.3	0.4	no	55.1
50N 3.OG	49.0	51.5	3.5	no	53.8	58.2	0.6	no	55.0
50N 4.OG	49.2	51.7	3.7	no	54.0	57.8	0.7	no	54.6
50N 5.OG	49.0	51.5	3.5	no	53.8	57.3	0.7	no	54.1
50N 6.OG	49.0	51.5	3.5	no	53.8	56.9	0.8	no	53.7
50N 7.OG	48.5	51.3	3.3	no	53.6	56.2	0.8	no	53.0
50W 4.OG	53.5	54.6	6.6	yes	56.9	55.8	3.8	no	52.6
50W 5.OG	58.9	59.2	11.2	yes	61.5	59.7	7.7	yes	56.5
50W 6.OG	59.1	59.4	11.4	yes	61.7	59.9	7.9	yes	56.7
50W 7.OG	59.2	59.5	11.5	yes	61.8	60.0	8.0	yes	56.8
51N 1.OG	44.1	51.8	0.8	no	54.6	54.5	0.4	no	58.2
51N 2.OG	44.4	51.9	0.8	no	54.7	54.6	0.4	no	58.3
51N 3.OG	45.2	51.7	1.1	no	54.5	54.3	0.6	no	58.0
52N 1.OG	48.5	53.3	1.7	no	56.5	53.6	1.6	no	55.8
52N 2.OG	50.0	54.2	2.1	no	57.4	54.1	2.1	no	56.3
52N 3.OG	55.4	57.2	4.7	no	60.4	57.2	4.8	no	59.4
52W 1.OG	52.2	53.9	5.0	yes	57.1	55.1	3.1	no	57.3
52W 2.OG	55.8	56.8	6.8	yes	60.0	57.3	5.3	yes	59.5
52W 3.OG	60.6	61.1	10.0	yes	64.3	61.2	9.2	yes	63.4
52S 1.OG	54.4	60.7	1.2	no	63.9	59.1	1.8	no	61.3
52S 2.OG	58.5	62.2	2.4	no	65.4	61.0	3.5	no	63.2
52S 3.OG	58.6	62.1	2.5	no	65.3	61.0	3.8	no	63.2
53N 1.OG	41.4	55.3	0.2	no	56.7	55.4	0.2	no	55.9
53N 2.OG	41.7	55.5	0.2	no	56.9	55.5	0.2	no	56.0
53N 3.OG	43.0	55.3	0.3	no	56.7	55.1	0.3	no	55.6
53W 1.OG	47.4	59.1	0.3	no	60.5	57.5	0.4	no	58.0
53W 2.OG	49.7	59.3	0.5	no	60.7	57.8	0.7	no	58.3
53W 3.OG	50.3	58.9	0.7	no	60.3	57.4	0.9	no	57.9
53S 3.OG	54.6	55.5	7.5	yes	56.9	56.5	4.5	no	57.0
53E 3.OG	55.6	56.3	8.3	yes	57.7	57.2	5.2	yes	57.7
54W 1.OG	39.1	55.9	0.1	no	57.3	58.7	0.0	no	59.2
54W 2.OG	40.3	56.1	0.1	no	57.5	58.9	0.1	no	59.4
54W 3.OG	42.0	55.8	0.2	no	57.2	58.4	0.1	no	58.9
54N 1.OG	38.8	55.8	0.1	no	57.2	55.9	0.1	no	56.4
54N 2.OG	39.3	56.1	0.1	no	57.5	56.3	0.1	no	56.8
54N 3.OG	43.3	55.9	0.2	no	57.3	56.0	0.2	no	56.5
55E 1.OG	59.7	60.2	10.0	yes	63.4	60.4	8.4	yes	62.6
55E 2.OG	63.2	63.5	11.9	yes	66.7	63.5	11.3	yes	65.7
55E 3.OG	63.6	63.9	11.2	yes	67.1	64.0	10.5	yes	66.2
55N 1.OG	42.4	63.5	0.0	no	66.7	65.6	0.0	no	67.8
55N 2.OG	43.0	49.2	1.2	no	52.0	54.0	0.4	no	57.7
55N 3.OG	44.9	62.9	0.1	no	66.1	64.9	0.0	no	67.1
55W 3.OG	50.3	52.3	4.3	no	55.5	54.2	2.2	no	56.4
55S 1.OG	63.1	63.2	15.2	yes	66.4	63.4	11.4	yes	65.6
55S 2.OG	66.2	66.3	17.8	yes	69.5	66.4	14.4	yes	68.6
55S 3.OG	67.5	67.6	17.7	yes	70.8	67.6	15.6	yes	69.8
56E 1.OG	56.3	56.9	8.9	yes	58.3	57.7	5.7	yes	58.2
56E 2.OG	59.6	59.9	11.9	yes	61.3	60.3	8.3	yes	60.8
56E 3.OG	60.3	60.5	12.5	yes	61.9	60.9	8.9	yes	61.4
56E 4.OG	60.6	60.8	12.8	yes	62.2	61.2	9.2	yes	61.7
56E 5.OG	60.8	61.0	13.0	yes	62.4	61.3	9.3	yes	61.8
56E 6.OG	60.8	61.0	13.0	yes	62.4	61.3	9.3	yes	61.8
56E 7.OG	61.0	61.2	13.2	yes	62.6	61.5	9.5	yes	62.0
56E 8.OG	61.0	61.2	13.2	yes	62.6	61.5	9.5	yes	62.0
56E Canal Par	54.5	55.4	7.4	yes	56.8	56.4	4.4	no	56.9
57W 1.OG	66.7	66.8	18.8	yes	69.1	67.1	11.1	yes	63.9
57W 2.OG	70.5	70.5	22.5	yes	72.8	70.7	14.4	yes	67.5
57W 3.OG	73.2	73.2	25.2	yes	75.5	73.3	17.4	yes	70.1
57N 1.OG	59.5	59.8	11.8	yes	62.1	62.6	3.0	no	59.4
57N 2.OG	59.7	60.0	12.0	yes	62.3	62.7	3.1	no	59.5
57N 3.OG	59.4	59.7	11.7	yes	62.0	62.3	3.2	no	59.1
57S 1.OG	63.1	63.3	13.7	yes	66.5	63.7	9.1	yes	65.9
57S 2.OG	67.0	67.1	16.7	yes	70.3	67.3	11.7	yes	69.5
57S 3.OG	68.1	68.2	17.8	yes	71.4	68.4	12.5	yes	70.6
57E 1.OG	50.2	52.6	3.8	no	55.8	55.6	1.5	no	57.8
57E 2.OG	52.1	54.6	3.7	no	57.8	57.6	1.5	no	59.8
57E 3.OG	53.3	55.6	3.9	no	58.8	58.5	1.5	no	60.7
58E 1.OG	66.8	66.9	18.9	yes	70.1	66.9	14.9	yes	69.1
58E 2.OG	70.0	70.0	22.0	yes	73.2	70.1	18.1	yes	72.3
58E 3.OG	70.5	70.5	22.5	yes	73.7	70.6	18.6	yes	72.8
58N 1.OG	63.9	64.3	10.3	yes	67.5	67.7	2.4	no	69.9
58N 2.OG	67.3	67.5	13.5	yes	70.7	69.4	4.2	yes	71.6
58N 3.OG	67.6	67.8	14.3	yes	71.0	69.4	4.7	yes	71.6
58W 2.OG	48.1	51.1	3.1	no	54.3	54.4	1.2	no	56.6
58W 3.OG	50.8	52.6	4.6	no	55.8	58.3	0.9	no	60.5
58S 1.OG	58.6	60.5	4.4	no	63.7	68.1	0.5	no	70.3
58S 2.OG	61.2	62.3	6.6	yes	65.5	68.1	1.0	no	70.3
58S 3.OG	63.0	63.6	8.7	yes	66.8	67.9	1.7	no	70.1
59W 1.OG	73.9	74.0	17.2	yes	77.2	74.1	13.5	yes	76.3
59W 2.OG	76.1	76.1	19.4	yes	79.3	76.2	15.6	yes	78.4
59W 3.OG	76.1	76.1	20.1	yes	79.3	76.2	16.1	yes	78.4
59N 1.OG	61.7	62.0	11.4	yes	65.2	63.0	6.0	yes	65.2
59N 2.OG	65.2	65.4	14.5	yes	68.6	65.8	8.6	yes	68.0
59N 3.OG	65.9	66.0	15.3	yes	69.2	66.4	9.4	yes	68.6
59E 1.OG	49.5	51.8	3.8	no	55.0	53.9	1.9	no	56.1
59E 2.OG	50.8	52.6	4.6	no	55.8	54.5	2.5	no	56.7
59E 3.OG	60.8	61.0	13.0	yes	64.2	61.6	7.6	yes	63.8
59S 1.OG	60.5	60.9	10.4	yes	64.1	61.6	6.3	yes	63.8
59S 2.OG	60.7	61.1	10.4	yes	64.3	61.8	6.3	yes	64.0
59S 3.OG	60.5	60.9	10.3	yes	64.1	61.7	6.1	yes	63.9
60N 1.OG	41.9	55.4	0.2	no	56.8	55.3	0.2	no	55.8
60N 2.OG	42.3	55.5	0.2	no	56.9	55.4	0.2	no	55.9
60N 3.OG	45.7	55.4	0.5	no	56.8	55.3	0.5	no	55.8
60N 3.OG	45.7	55.4	0.5	no	56.8	55.3	0.5	no	55.8
60S 1.OG	61.2	61.4	13.4	yes	62.8	61.7	9.7	yes	62.2
60S 2.OG	64.2	64.3	16.3	yes	65.7	64.5	12.5	yes	65.0
60S 3.OG	64.9	65.0	17.0	yes	66.4	65.1	13.1	yes	65.6
61	64.3	64.4	16.4	yes	67.6	64.9	8.6	yes	67.1
62	61.4	61.6	13.6	yes	64.8	61.9	9.9	yes	64.1

Sub-Structure - 24 Months

Receptor Name	Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
50N 2.OG	42.7	49.1	1.1	no	51.4	58.0	0.1	no	54.8
50N 3.OG	43.7	49.4	1.4	no	51.7	57.8	0.2	no	54.6
50N 4.OG	43.9	49.4	1.4	no	51.7	57.3	0.2	no	54.1
50N 5.OG	43.7	49.4	1.4	no	51.7	56.8	0.2	no	53.6
50N 6.OG	43.7	49.4	1.4	no	51.7	56.3	0.2	no	53.1
50N 7.OG	43.2	49.2	1.2	no	51.5	55.7	0.3	no	52.5
50W 4.OG	51.0	52.8	4.8	no	55.1	54.5	2.5	no	51.3
50W 5.OG	57.2	57.7	9.7	yes	60.0	58.3	6.3	yes	55.1
50W 6.OG	57.1	57.6	9.6	yes	59.9	58.3	6.3	yes	55.1
50W 7.OG	57.2	57.7	9.7	yes	60.0	58.3	6.3	yes	55.1
51N 1.OG	39.7	51.3	0.3	no	54.1	54.3	0.2	no	58.0
51N 2.OG	40.7	51.5	0.4	no	54.3	54.4	0.2	no	58.1
51N 3.OG	41.5	51.1	0.5	no	53.9	54.0	0.3	no	57.7
52N 1.OG	41.3	52.0	0.4	no	55.2	52.4	0.4	no	54.6
52N 2.OG	41.7	52.5	0.4	no	55.7	52.4	0.4	no	54.6
52N 3.OG	44.9	53.2	0.7	no	56.4	53.1	0.7	no	55.3
52W 1.OG	47.8	51.4	2.5	no	54.6	53.4	1.4	no	55.6
52W 2.OG	50.9	53.5	3.5	no	56.7	54.5	2.5	no	56.7
52W 3.OG	56.6	57.7	6.6	yes	60.9	57.9	5.9	yes	60.1
52S 1.OG	49.1	59.9	0.4	no	63.1	57.9	0.6	no	60.1
52S 2.OG	52.8	60.6	0.8	no	63.8	58.8	1.3	no	61.0
52S 3.OG	53.1	60.5	0.9	no	63.7	58.6	1.4	no	60.8
53N 1.OG	33.3	55.1	0.0	no	56.5	55.2	0.0	no	55.7
53N 2.OG	33.7	55.3	0.0	no	56.7	55.3	0.0	no	55.8
53N 3.OG	36.0	55.1	0.1	no	56.5	54.9	0.1	no	55.4
53W 1.OG	33.5	58.8	0.0	no	60.2	57.1	0.0	no	57.6
53W 2.OG	34.4	58.8	0.0	no	60.2	57.1	0.0	no	57.6
53W 3.OG	33.7	58.2	0.0	no	59.6	56.5	0.0	no	57.0
53S 3.OG	51.6	53.2	5.2	yes	54.6	54.8	2.8	no	55.3
53E 3.OG	52.3	53.7	5.7	yes	55.1	55.2	3.2	no	55.7
54W 1.OG	30.9	55.8	0.0	no	57.2	58.7	0.0	no	59.2
54W 2.OG	32.4	56.0	0.0	no	57.4	58.8	0.0	no	59.3
54W 3.OG	34.1	55.6	0.0	no	57.0	58.3	0.0	no	58.8
54N 1.OG	30.8	55.7	0.0	no	57.1	55.8	0.0	no	56.3
54N 2.OG	31.8	56.0	0.0	no	57.4	56.2	0.0	no	56.7
54N 3.OG	36.9	55.8	0.1	no	57.2	55.9	0.1	no	56.4
55E 1.OG	53.7	55.3	5.1	yes	58.5	55.9	3.9	no	58.1
55E 2.OG	58.5	59.3	7.7	yes	62.5	59.4	7.2	yes	61.6
55E 3.OG	58.5	59.5	6.8	yes	62.7	59.7	6.2	yes	61.9
55N 1.OG	34.7	63.5	0.0	no	66.7	65.6	0.0	no	67.8
55N 2.OG	35.9	48.3	0.3	no	51.1	53.7	0.1	no	57.4
55N 3.OG	38.2	62.8	0.0	no	66.0	64.9	0.0	no	67.1
55W 3.OG	39.2	48.5	0.5	no	51.7	52.2	0.2	no	54.4
55S 1.OG	55.5	56.2	8.2	yes	59.4	57.1	5.1	yes	59.3
55S 2.OG	60.0	60.3	11.8	yes	63.5	60.6	8.6	yes	62.8
55S 3.OG	60.2	60.6	10.7	yes	63.8	60.8	8.8	yes	63.0
56E 1.OG	48.3	51.2	3.2	no	52.6	53.5	1.5	no	54.0
56E 2.OG	52.7	54.0	6.0	yes	55.4	55.4	3.4	no	55.9
56E 3.OG	52.7	54.0	6.0	yes	55.4	55.4	3.4	no	55.9
56E 4.OG	52.8	54.0	6.0	yes	55.4	55.4	3.4	no	55.9
56E 5.OG	52.9	54.1	6.1	yes	55.5	55.5	3.5	no	56.0
56E 6.OG	52.9	54.1	6.1	yes	55.5	55.5	3.5	no	56.0
56E 7.OG	53.1	54.3	6.3	yes	55.7	55.6	3.6	no	56.1
56E 8.OG	53.1	54.3	6.3	yes	55.7	55.6	3.6	no	56.1
56E Canal Par	45.8	50.0	2.0	no	51.4	52.9	0.9	no	53.4
57W 1.OG	61.6	61.8	13.8	yes	64.1	62.7	6.7	yes	59.5
57W 2.OG	65.6	65.7	17.7	yes	68.0	66.1	9.8	yes	62.9
57W 3.OG	65.7	65.8	17.8	yes	68.1	66.1	10.2	yes	62.9
57N 1.OG	54.5	55.4	7.4	yes	57.7	60.8	1.2	no	57.6
57N 2.OG	54.9	55.7	7.7	yes	58.0	60.9	1.3	no	57.7
57N 3.OG	54.5	55.4	7.4	yes	57.7	60.4	1.3	no	57.2
57S 1.OG	57.4	58.1	8.5	yes	61.3	59.2	4.6	no	61.4
57S 2.OG	62.1	62.4	12.0	yes	65.6	63.0	7.4	yes	65.2
57S 3.OG	62.2	62.5	12.1	yes	65.7	63.1	7.2	yes	65.3
57E 1.OG	44.5	50.2	1.4	no	53.4	54.6	0.5	no	56.8
57E 2.OG	46.3	52.2	1.3	no	55.4	56.5	0.4	no	58.7
57E 3.OG	47.5	53.1	1.4	no	56.3	57.5	0.5	no	59.7
58E 1.OG	65.1	65.2	17.2	yes	68.4	65.3	13.3	yes	67.5
58E 2.OG	68.4	68.4	20.4	yes	71.6	68.5	16.5	yes	70.7
58E 3.OG	68.4	68.4	20.4	yes	71.6	68.5	16.5	yes	70.7
58N 1.OG	60.7	61.5	7.5	yes	64.7	66.6	1.3	no	68.8
58N 2.OG	64.3	64.7	10.7	yes	67.9	67.8	2.6	no	70.0
58N 3.OG	64.3	64.6	11.1	yes	67.8	67.5	2.8	no	69.7
58W 2.OG	44.6	49.6	1.6	no	52.8	53.8	0.6	no	56.0
58W 3.OG	47.3	50.7	2.7	no	53.9	57.8	0.4	no	60.0
58S 1.OG	43.6	56.3	0.2	no	59.5	67.6	0.0	no	69.8
58S 2.OG	46.3	56.2	0.5	no	59.4	67.1	0.0	no	69.3
58S 3.OG	47.1	55.6	0.7	no	58.8	66.3	0.1	no	68.5
59W 1.OG	59.6	61.4	4.6	no	64.6	63.1	2.5	no	65.3
59W 2.OG	62.5	63.5	6.8	yes	66.7	64.7	4.1	no	66.9
59W 3.OG	62.6	63.5	7.5	yes	66.7	64.5	4.4	no	66.7
59N 1.OG	57.4	58.2	7.6	yes	61.4	60.2	3.2	no	62.4
59N 2.OG	61.8	62.1	11.2	yes	65.3	63.1	5.9	yes	65.3
59N 3.OG	62.0	62.3	11.6	yes	65.5	63.2	6.2	yes	65.4
59E 1.OG	43.4	49.3	1.3	no	52.5	52.6	0.6	no	54.8
59E 2.OG	45.0	49.8	1.8	no	53.0	52.8	0.8	no	55.0
59E 3.OG	54.9	55.7	7.7	yes	58.9	57.5	3.5	no	59.7
59S 1.OG	54.9	56.2	5.7	yes	59.4	58.1	2.8	no	60.3
59S 2.OG	54.9	56.3	5.6	yes	59.5	58.2	2.7	no	60.4
59S 3.OG	54.5	56.0	5.4	yes	59.2	58.1	2.5	no	60.3
60N 1.OG	34.6	55.2	0.0	no	56.6	55.1	0.0	no	55.6
60N 2.OG	36.0	55.4	0.1	no	56.8	55.3	0.1	no	55.8
60N 3.OG	38.6	55.0	0.1	no	56.4	54.9	0.1	no	55.4
60N 3.OG	38.6	55.0	0.1	no	56.4	54.9	0.1	no	55.4
60S 1.OG	51.1	52.8	4.8	no	54.2	54.6	2.6	no	55.1
60S 2.OG	54.1	55.1	7.1	yes	56.5	56.2	4.2	no	56.7
60S 3.OG	55.9	56.6	8.6	yes	58.0	57.4	5.4	yes	57.9
61	61.7	61.9	13.9	yes	65.1	62.8	6.5	yes	65.0
62	52.4	53.7	5.7	yes	56.9	55.2	3.2	no	57.4

CP-3

Install equipment and Conveyance Systems - 2 Months Overlap

Receptor Name	Construction Leq	Weekend: Total Leq	Weekend: Noise Level increment	Weekend: Impact?	Weekend: L10 = Existing L10+Noise level increment	Weekday: Total Leq	Weekday: Noise Level increment	Weekday: Impact?	Weekday: L10 = Existing L10+Noise level increment
50N 2.OG	46.9	50.5	2.5	no	52.8	58.2	0.3	no	55.0
50N 3.OG	47.7	50.9	2.9	no	53.2	58.0	0.4	no	54.8
50N 4.OG	47.9	51.0	3.0	no	53.3	57.6	0.5	no	54.4
50N 5.OG	47.7	50.9	2.9	no	53.2	57.1	0.5	no	53.9
50N 6.OG	47.7	50.9	2.9	no	53.2	56.7	0.6	no	53.5
50N 7.OG	47.3	50.7	2.7	no	53.0	56.0	0.6	no	52.8
50W 4.OG	48.7	51.4	3.4	no	53.7	53.7	1.7	no	50.5
50W 5.OG	50.9	52.7	4.7	no	55.0	54.5	2.5	no	51.3
50W 6.OG	51.1	52.8	4.8	no	55.1	54.6	2.6	no	51.4
50W 7.OG	51.3	53.0	5.0	yes	55.3	54.7	2.7	no	51.5
51N 1.OG	50.5	53.8	2.8	no	56.6	55.7	1.6	no	59.4
51N 2.OG	53.5	55.5	4.4	no	58.3	56.9	2.7	no	60.6
51N 3.OG	53.6	55.4	4.8	no	58.2	56.7	3.0	no	60.4
52N 1.OG	44.4	52.4	0.8	no	55.6	52.7	0.7	no	54.9
52N 2.OG	45.9	53.0	0.9	no	56.2	53.0	1.0	no	55.2
52N 3.OG	49.3	54.2	1.7	no	57.4	54.1	1.7	no	56.3
52W 1.OG	50.1	52.6	3.7	no	55.8	54.2	2.2	no	56.4
52W 2.OG	53.3	55.0	5.0	yes	58.2	55.7	3.7	no	57.9
52W 3.OG	58.6	59.3	8.2	yes	62.5	59.5	7.5	yes	61.7
52S 1.OG	54.2	60.6	1.1	no	63.8	59.0	1.7	no	61.2
52S 2.OG	57.5	61.8	2.0	no	65.0	60.5	3.0	no	62.7
52S 3.OG	57.9	61.8	2.2	no	65.0	60.6	3.4	no	62.8
53N 1.OG	37.9	55.2	0.1	no	56.6	55.3	0.1	no	55.8
53N 2.OG	38.1	55.4	0.1	no	56.8	55.4	0.1	no	55.9
53N 3.OG	39.6	55.1	0.1	no	56.5	54.9	0.1	no	55.4
53W 1.OG	44.7	59.0	0.2	no	60.4	57.3	0.2	no	57.8
53W 2.OG	48.7	59.2	0.4	no	60.6	57.7	0.6	no	58.2
53W 3.OG	48.7	58.7	0.5	no	60.1	57.2	0.7	no	57.7
53S 3.OG	50.1	52.2	4.2	no	53.6	54.2	2.2	no	54.7
53E 3.OG	50.3	52.3	4.3	no	53.7	54.2	2.2	no	54.7
54W 1.OG	35.4	55.8	0.0	no	57.2	58.7	0.0	no	59.2
54W 2.OG	35.9	56.0	0.0	no	57.4	58.8	0.0	no	59.3
54W 3.OG	37.8	55.7	0.1	no	57.1	58.3	0.0	no	58.8
54N 1.OG	35.5	55.7	0.0	no	57.1	55.8	0.0	no	56.3
54N 2.OG	36.2	56.0	0.0	no	57.4	56.2	0.0	no	56.7
54N 3.OG	39.8	55.8	0.1	no	57.2	55.9	0.1	no	56.4
55E 1.OG	47.3	52.0	1.8	no	55.2	53.3	1.3	no	55.5
55E 2.OG	49.5	53.7	2.1	no	56.9	54.1	1.9	no	56.3
55E 3.OG	54.1	56.5	3.8	no	59.7	56.8	3.3	no	59.0
55N 1.OG	38.5	63.5	0.0	no	66.7	65.6	0.0	no	67.8
55N 2.OG	38.7	48.5	0.5	no	51.3	53.7	0.1	no	57.4
55N 3.OG	40.2	62.8	0.0	no	66.0	64.9	0.0	no	67.1
55W 3.OG	42.9	49.2	1.2	no	52.4	52.5	0.5	no	54.7
55S 1.OG	48.0	51.0	3.0	no	54.2	53.5	1.5	no	55.7
55S 2.OG	51.0	52.9	4.4	no	56.1	54.5	2.5	no	56.7
55S 3.OG	56.1	57.0	7.1	yes	60.2	57.5	5.5	yes	59.7
56E 1.OG	48.4	51.2	3.2	no	52.6	53.6	1.6	no	54.1
56E 2.OG	53.0	54.2	6.2	yes	55.6	55.5	3.5	no	56.0
56E 3.OG	53.0	54.2	6.2	yes	55.6	55.5	3.5	no	56.0
56E 4.OG	53.1	54.3	6.3	yes	55.7	55.6	3.6	no	56.1
56E 5.OG	53.1	54.3	6.3	yes	55.7	55.6	3.6	no	56.1
56E 6.OG	53.2	54.3	6.3	yes	55.7	55.7	3.7	no	56.2
56E 7.OG	53.2	54.3	6.3	yes	55.7	55.7	3.7	no	56.2
56E 8.OG	53.2	54.3	6.3	yes	55.7	55.7	3.7	no	56.2
56E Canal Par	46.4	50.3	2.3	no	51.7	53.1	1.1	no	53.6
57W 1.OG	69.1	69.1	21.1	yes	71.4	69.3	13.3	yes	66.1
57W 2.OG	72.7	72.7	24.7	yes	75.0	72.8	16.5	yes	69.6
57W 3.OG	73.0	73.0	25.0	yes	75.3	73.1	17.2	yes	69.9
57N 1.OG	60.9	61.1	13.1	yes	63.4	63.3	3.7	no	60.1
57N 2.OG	62.4	62.6	14.6	yes	64.9	64.2	4.6	no	61.0
57N 3.OG	62.5	62.7	14.7	yes	65.0	64.1	5.0	yes	60.9
57S 1.OG	60.4	60.7	11.1	yes	63.9	61.4	6.8	yes	63.6
57S 2.OG	63.5	63.7	13.3	yes	66.9	64.2	8.6	yes	66.4
57S 3.OG	63.9	64.1	13.7	yes	67.3	64.5	8.6	yes	66.7
57E 1.OG	48.8	51.8	3.0	no	55.0	55.2	1.1	no	57.4
57E 2.OG	50.2	53.6	2.7	no	56.8	57.1	1.0	no	59.3
57E 3.OG	51.5	54.6	2.9	no	57.8	58.1	1.1	no	60.3
58E 1.OG	59.7	60.0	12.0	yes	63.2	60.4	8.4	yes	62.6
58E 2.OG	63.3	63.4	15.4	yes	66.6	63.6	11.6	yes	65.8
58E 3.OG	63.7	63.8	15.8	yes	67.0	64.0	12.0	yes	66.2
58N 1.OG	55.1	57.6	3.6	no	60.8	65.7	0.4	no	67.9
58N 2.OG	58.6	59.9	5.9	yes	63.1	66.1	0.9	no	68.3
58N 3.OG	59.2	60.2	6.7	yes	63.4	65.8	1.1	no	68.0
58W 2.OG	43.9	49.4	1.4	no	52.6	53.7	0.5	no	55.9
58W 3.OG	46.8	50.5	2.5	no	53.7	57.8	0.4	no	60.0
58S 1.OG	53.2	57.9	1.8	no	61.1	67.8	0.2	no	70.0
58S 2.OG	57.2	59.5	3.8	no	62.7	67.5	0.4	no	69.7
58S 3.OG	57.5	59.4	4.5	no	62.6	66.7	0.5	no	68.9
59W 1.OG	71.2	71.4	14.6	yes	74.6	71.6	11.0	yes	73.8
59W 2.OG	74.8	74.9	18.2	yes	78.1	75.0	14.4	yes	77.2
59W 3.OG	75.5	75.5	19.5	yes	78.7	75.6	15.5	yes	77.8
59N 1.OG	60.6	61.0	10.4	yes	64.2	62.2	5.2	yes	64.4
59N 2.OG	62.8	63.1	12.2	yes	66.3	63.9	6.7	yes	66.1
59N 3.OG	63.6	63.8	13.1	yes	67.0	64.5	7.5	yes	66.7
59E 1.OG	48.1	51.1	3.1	no	54.3	53.5	1.5	no	55.7
59E 2.OG	49.1	51.6	3.6	no	54.8	53.8	1.8	no	56.0
59E 3.OG	57.7	58.1	10.1	yes	61.3	59.2	5.2	yes	61.4
59S 1.OG	58.1	58.8	8.3	yes	62.0	59.9	4.6	no	62.1
59S 2.OG	58.2	58.9	8.2	yes	62.1	60.1	4.6	no	62.3
59S 3.OG	57.9	58.6	8.0	yes	61.8	59.9	4.3	no	62.1
60N 1.OG	38.3	55.3	0.1	no	56.7	55.2	0.1	no	55.7
60N 2.OG	38.9	55.4	0.1	no	56.8	55.3	0.1	no	55.8
60N 3.OG	42.0	55.1	0.2	no	56.5	55.0	0.2	no	55.5
60N 3.OG	42.0	55.1	0.2	no	56.5	55.0	0.2	no	55.5
60S 1.OG	52.6	53.9	5.9	yes	55.3	55.3	3.3	no	55.8
60S 2.OG	55.7	56.4	8.4	yes	57.8	57.2	5.2	yes	57.7
60S 3.OG	56.6	57.2	9.2	yes	58.6	57.9	5.9	yes	58.4
61	58.2	58.6	10.6	yes	61.8	60.4	4.1	no	62.6
62	49.2	51.7	3.7	no	54.9	53.8	1.8	no	56.0

Appendix 27-1
Comments Received on the
Draft Environmental Impact Statement

October 19, 2017

Mr. Christos Tsiamis
Remedial Project Manager – Gowanus Canal Site
U.S. Environmental Protection Agency, Region 2
290 Broadway, 20th Floor
New York, NY 10007

Re: EPA
Gowanus Canal Superfund Cleanup
Gowanus Canal Area, Brooklyn, NY
16PR02427

Dear Mr. Tsiamis:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project.

We have reviewed the Draft Environmental Impact Statement (DEIS) that was submitted to our office on September 18th, 2017. We understand that this DEIS is being prepared by the NYC DEP for local environmental review, and we note that we will continue to provide our comments and participate in consultation with the understanding that EPA is the lead agency under Section 106.

Based on our review of the project details to date, it appears feasible to retain and incorporate the historic former Gowanus Station building (234 Butler Street) into the project. This building, which has a prominent street presence at the corner (and very edge of) the city's preferred site, has overarching significance for the National Register eligible Gowanus Historic District. Its demolition would adversely affect both the building and the National Register eligible Gowanus Canal Historic District. To destroy this intact, architecturally distinctive example of Brooklyn's civic and industrial heritage would be a disservice to the Gowanus neighborhood and to the city as a whole.

We offer the following comments on the text of the DEIS:

1. With respect to the possible effects to archaeological resources, we restate our previous recommendation (Brazee, 3 July 2017) that for areas that have identified potential for deeply buried archaeological deposits, preliminary stratigraphic investigation (a geoarchaeological study) should be undertaken to assess the nature and extent of potentially culture-bearing deposits within the APE. The results of this investigation would provide the basis for

determining whether further archaeological studies are needed and, if so, the most appropriate method for such work.

2. With respect to the status of 190 Butler Street, CRIS correctly shows that the building is a non-contributing building in the State/National Register-eligible Gowanus Canal Historic District (see page 7-13 of Chapter 7: Historic and Cultural Resources)

3. With respect to the Alternatives chapter, SHPO is of the opinion that the demolition of contributing buildings (including the two Nevins Street properties as well as the above-mentioned 234 Butler) at the Head End site would adversely affect the buildings and the Historic District. We strongly encourage the project to take a hard look at retaining and preserving the former Gowanus Station at 234 Butler Street. It remains unclear to us why the construction of the facility would necessitate demolition of the Gowanus Station, whose 1914 section occupies a relatively small footprint at the very northeastern corner of the site. We find this DEIS inadequate for purposes of Section 106 consideration of alternatives, so we request a digital copy of the NYC DEP engineering analysis referred to therein. We may request further consideration of alternatives under 106, beyond this engineering analysis.

4. With respect to the Alternatives chapter, we agree with some of the conclusions in the Thomas Greene Park property analysis section, however we note that increasing waterfront access at the expense of historic resources is not a valid consideration in this instance. Historically the Gowanus Canal was lined with the industrial buildings and infrastructure that it was built to serve, and this continues to be its character today. Therefore, we feel that removing historic buildings along its edge is not at all justified by furthering citywide goals of increased public waterfront access. It is SHPO's opinion that the Park property alternative represents the least impact to historic resources, as well as the most opportunity to satisfy a variety of land-use requirements and public benefits, and for that reason this alternative should be more seriously considered.

5. We have no concerns with the demolition of the Owls Head properties (122 5th Street and 22 2nd Avenue) because, as stated in our previous letter, these structures do not contribute to the historic district.

6. We note that the properties located at the 6th Street Alternate site are contributing resources to the S/NR eligible Gowanus Canal Historic District (141 6th Street/aka 27-31 2nd Ave), and therefore their removal would adversely affect the buildings and the historic district

We would appreciate if the requested information could be provided via our Cultural Resource Information System (CRIS) at www.nysparks.com/shpo/online-tools/ Once on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an existing project". You will need this project number and your e-mail address. If you have any questions, I can be reached at (518) 268-2182.

Sincerely,

O. Brazee

Olivia Brazee
Historic Site Restoration Coordinator
olivia.brazee@parks.ny.gov

via e-mail only

CC: Brian Carr, EPA
Charles Vandrei, NYS DEC
Danielle Adams, Ecology & Environment
John Vetter, Ecology & Environment
Rasheed Lucas, NYC DEP
Gina Santucci, NYC LPC

Landmarks Preservation Commission

Meenakshi Srinivasan
Chair

Sarah Carroll
Executive Director
SCarroll@lpc.nyc.gov

1 Centre Street
9th Floor North
New York, NY 10007

212 669 7902 tel
212 669 7797 fax

November 29, 2017

Rasheed Lucas, Project Manager
Wastewater and Special Projects
Bureau of Environmental Planning and Analysis
New York City Department of Environmental Protection
59-17 Junction Boulevard, 11th Floor
Flushing, NY 11373

RLucas@dep.nyc.gov

Dear Mr. Lucas:

I am writing in reference to Gowanus Canal Combined Sewer Overflow (CSO) Facilities (CEQR# 17DEP040K). The Landmarks Preservation Commission initially reviewed the property as part of the agency review of the Draft Scope of Work for the EIS on April 6, 2017 and subsequently in the review of the Historic and Cultural Resources chapter of the EIS on June 7, 2017. In the review LPC notes that 234 Butler Street (aka, 226 Nevins), 270 Nevins Street and 242-244 Nevins Street are located in the National Register Eligible Gowanus Canal Historic District. The LPC did not identify these properties as LPC eligible. The LPC did identify a building in the radius as LPC eligible, the Pumping Station (aka Flushing Tunnel Building) located at 201 Douglass St. (Brooklyn Block 411, Lot 14). The Commission continues to evaluate the area for potential historic resources.

Sincerely,

Sarah Carroll

Sarah Carroll

To: Terrell Estesen, Director
Bureau of Environmental Planning and Analysis
NYC Environmental Protection

From: Naim Rasheed, Senior Director
Traffic Engineering & Planning

Re: Gowanus Canal CSO Facilities, Brooklyn
Draft Environmental Impact Statement (DEIS)
CEQR No. 17DEP040K

Date: September 22, 2017

We have completed our review of Transportation and Construction chapters of the referenced DEIS for the Head End and Owls Head combined sewer overflow (CSO) tank facilities located in Brooklyn Community District 6. The Build Year is 2026.

The Head End facility would be constructed along Nevins and DeGraw Streets. Vehicle access/egress during construction is anticipated to occur along Nevis Street between Douglas and DeGraw Streets, and an additional egress onto DeGraw Street between Nevins Street and the Gowanus Canal. In addition, the Head End site will include open space or waterfront access which would generate a maximum of 20 person trips and two vehicle trips during any hour on weekdays and 28 person trips and four vehicle trips during the peak Saturday period. The Owls Head facility is located at the middle of the Gowanus Canal near the terminus of 2nd Avenue at the 4th Street turning basin.

Vehicle access during construction would be via 2nd Avenue between 5th and 6th Streets. The maximum construction related traffic, to be generated by both facilities, would be approximately 43 passenger-car-equivalents (PCEs) between 7am and 8am and 40 PCEs between 3pm and 4pm.

Based on our review of the Level I (Trip Generation) screening assessment for the operation and construction scenarios, we concur with the lead agency's determination that detailed traffic and pedestrian analyses is not warranted. Office of Construction, Mitigation and Coordination would provide stipulation to maintain pedestrian and vehicular safety and mobility during the construction.

If there are any questions, I can be reached at (212) 839-7710 or you may contact Marjorie Bryant at (212) 839-7756.

c: D/C E. Beaton, B/C K. Bray, R. Lucas (DEP), N. Dagher, G. Smalls, B/E L. Robinson, E. Brunner (MOEC), S. Ahmed, M. Bryant, File

E:\Traffic Engineering & Planning\CEQR\CEQR Environmental Review\Gowanus Tanks 17DEP040K\DEIS so

January 29, 2018

Rasheed Lucas, Project Manager
Bureau of Environmental Planning and Analysis,
New York City Department of Environmental Protection
59-17 Junction Blvd,
11th Floor
Flushing, NY 11373-5108

Re: Comments on Gowanus Canal CSO Facilities Project DEIS, CEQR No. 17DEP040K

Dear Mr. Lucas,

These comments on the Draft Environmental Impact Statement for the Gowanus Canal CSO Facilities Project are submitted on behalf of Fifth Avenue Committee, FUREE, Friends of Thomas Greene Park, Gowanus Canal Conservancy, and New York Lawyers for the Public Interest. We are community groups and technical assistance providers working to preserve and steward open space and the environment in the Gowanus area, and to ensure the area remains affordable and accessible to low-income residents.

As an initial matter, we want to stress that the project as a whole will improve environmental conditions in the surrounding neighborhood. While a "no action alternative" was not considered here because the U.S. Environmental Protection Agency has ordered the installation of storage tanks alongside the Gowanus Canal to prevent CSO discharge into the Canal, we agree with EPA that no action to curb sewage discharge into the Canal is unacceptable to the community. In addition to constructing the tanks studied in the DEIS, we strongly urge DEP to invest in additional green or grey infrastructure in upland areas of the CSO-shed to reduce the impact on the Gowanus community. Upland areas that contribute to lowland pollution should also bear their fair share of new infrastructure.

We strongly urge DEP to site Head of Canal storage tank at the primary study site alongside the Canal rather than within Thomas Greene Park. The key significant adverse environmental impact of the alternative site beneath Thomas Greene Park, the loss of active recreational park space due to the need for a head house above the storage tank, should not be taken lightly. As the DEIS rightly notes, the study area includes potential environmental justice areas, and the surrounding neighborhoods are sorely lacking in open space. Thomas Greene Park is the only large park within a 10 minute walk of the 4,500 residents of public housing in Gowanus Houses, Wyckoff Gardens and Warren Street Houses. Siting the tank in the park would permanently displace over 30,000 square feet of park space to construct the head house and highly degrade another 50,000 square feet of the park to construct the tank. In addition, given that the head house will be about 50 feet tall, it would likely cast shadows over large portions of the park. We strongly urge DEP not to turn to this alternative site based on the significant adverse impact of loss of open space, as well as other considerations noted in the DEIS, including the increased cost and disruption during construction of building the tank at the alternative site due to the need to build additional conveyances below street level.

Should DEP be forced to build the storage tank at the alternative site within the park, mitigation must include a seamless transition to a temporary park and pool during construction as well as permanent additional recreation space near the existing park to replace the lost use of the portion of the park where the head house will be located. In addition, mitigation should include upgrades to the rebuilt park in design, vegetation, shade, and recreational facilities.

Finally, as the DEIS notes, there are multiple sources of contamination in the area – most importantly the Fulton MGP site, which has left coal tar far below the ground in the Head End Site vicinity – with multiple agencies governing remediation and multiple responsible parties. Impacts from the construction of the tanks are in many cases difficult to separate from impacts of other remediation projects on the same sites. We urge DEP to continue to coordinate with National Grid and with EPA, as well as any other responsible parties and agencies, in order to streamline timelines for remediation and construction, minimize impacts to the community, and share responsibility for mitigation.

We have several additional specific concerns about portions of the DEIS, as set forth below.

Head End Site

1. **Construction Impacts**

We have concerns about impacts during the period of construction of the tank and urge DEP to further elaborate on impacts and mitigation strategies in its final EIS. We remain concerned about the projected time frame for remediation and construction, particularly in terms of impacts to Thomas Greene Park. As the impacts of the construction, including noise and odors, will be felt most acutely in the western half of the Park, there must be a clear plan and funding for mitigation of these impacts at the site, or replacement amenities at a temporary location. As this half of the park will also need to be remediated, schedules and actions should be coordinated to minimize the length of time the park will be closed and to ensure that park users not be exposed to noise, odors and contaminated materials to be excavated from the site. One possibility is for DEP to coordinate with National Grid so that peak construction periods at the site will be simultaneous with the period of time that National Grid will be closing Thomas Greene Park for remediation and reconstruction.

a. Time Period for Construction: The calendar included in figure 20-2 envisions eight full years of construction activity for each tank. This is an extraordinarily long period of time for the significant disruptions anticipated, and longer than DEP has previously estimated to EPA and the public. The FEIS should include further explanation of the construction timeline, including comparisons to similar projects DEP has undertaken in the past.

b. Noise: Given the high levels of noise anticipated from the project, we are concerned about the lack of appropriate mitigation included in the DEIS. Further detail about the periods of time during which noise will be this high should be included in the FEIS, along with more discussion of possible mitigation measures. In addition, we are surprised that the DEIS estimates existing background noise levels at Thomas Greene Park to be so high that the noise generated from construction would not be a problem at the park. If the park will in fact be open during construction and the pool in use, lifeguards and others will need to be able to hear as a safety measure. The FEIS should consider noise impacts to park users as well as to residents near the staging area.

c. Air Quality: We are concerned about the potential for high levels of certain pollutants on an intermittent basis, such as NO2, during certain peak construction phases. The FEIS should include more detail about this possibility as well as consider closing Thomas Greene Park and providing a temporary park facility as a mitigation measure during these peak construction phases. One possibility should include coordinating with National Grid on timelines so that peak construction at this site is simultaneous with the 2-year or so period when National Grid will close Thomas Greene Park for remediation and reconstruction. This way a temporary park facility will already be in existence and families and children can continue to have recreation opportunities while avoiding exposure to harmful air pollutants.

d. Traffic and transportation: The DEIS estimates an addition 200 truck trips per day during construction, which is a very high number over a long period of time – particularly when there is a park across the street heavily used by families with young children during peak months. The FEIS must include more information about possible ways of reducing this truck traffic, as well as about safety measures for families using the park.

2. Open Space

Constructing the storage tank alongside the canal at RH-3 avoids the significant adverse impact of the loss of over 30,000 square feet of open space in Thomas Greene Park, as well as the degradation of another 50,000 square feet of park space. In addition, construction of the tank creates the opportunity to add publicly accessible open space to this area, which is sorely lacking in open space.

This action presents an opportunity for the City to thoughtfully design a public facility for an environmental justice community that has been disproportionately impacted by the pollution in the Gowanus Canal, and is underserved in park access. As this area is also being studied for a Gowanus neighborhood wide ULURP, initiated by the DCP, capital expenses could not only fall on the responsible parties but should be evaluated for the Neighborhood Development Fund and other financing mechanisms, such as the NYC Department of Mental Health and Hygiene Center for Health Equity, to support increasing park space and community amenities. We urge the City to consider the following:

a. Consider how this public space design fits into the larger public space framework in the neighborhood, including a renovated Thomas Green Park, probable shore public walkways created by private development, a potential Sponge Park on the Degraw St End, and/or interpretive plaza surrounding the historic Pump House and Gate House, building on the community-based vision for the Gowanus Lowlands. [1]

b. Host a community process to envision the design and programming of this facility and the city owned properties mentioned above.
c. Though DEP will need access to the top of the tank for regular maintenance, the project's design should allow flexible public access when maintenance is not occurring.
d. Park amenities for the top of the tank should include programs that require hardscape, such as the skatepark proposed by Friends of Thomas Greene Park. This can allow more room in Thomas Greene Park for deeply permeable landscapes that can help manage stormwater.
e. As the top of the tank is at least 50 feet above grade, develop a welcoming and accessible connection to the top of tank. Consider turning Degraw between Nevins and the Canal into a DOT plaza street to connect Thomas Green Park to the waterfront with at-grade public space.
f. Ensure that truck access points interfere as little as possible with public access to the waterfront and that the design maximizes park connectivity as well as CSO facility operations. Combine parking areas for DEP facilities to save space and allow a generous pedestrian entrance on Butler St.
g. Consider purchasing the staging site at 270 Nevins to secure additional park space once the project is complete. The proposed staging area, which is currently only envisioned to be leased by DEP, is also a big hot spot of MGP contamination *(see map, page 10)*, so acquisition could expedite cleanup while securing a rare opportunity to increase park space in Gowanus.
h. Integrate education and interpretation about Gowanus history, contamination, and sewage infrastructure into the facility, including:
    i. Incorporate the historic Gowanus Station building or facade into design for the head house
    ii. Develop interpretive signage or site design to educate residents and visitors about the NYC sewage system, Gowanus hydrology, and the functions of the CSO tank, Flushing Tunnel, and the Pump Station.
    iii. Demonstrate stormwater management through green infrastructure to encourage implementation through the Gowanus Watershed.

3. Odors

The DEIS states that the anticipated concentrations of hydrogen sulfide in the air will not exceed the 1 ppb significant odor threshold for sensitive receptors. However it lacks information to help the community understand a) what the odor control system components are and how it will function, b) what if any "spikes" in odor may occur during maintenance and other cleaning events, and c) what the

[1] Gowanus Canal Conservancy and SCAPE, "Gowanus Lowlands: A Blueprint for NYC's Next Great Park", July 2017

level of “rotten egg” or sewage odor that is anticipated (the 0.75 ppb) will actually smell like in the vicinity. While the DEIS mentions odor levels at the nearby future hotel site, it doesn’t mention odors at Thomas Greene Park next door. The FEIS should include additional information about anticipated odors.

4. Impacts on Business

As the DEIS notes, 19 businesses would be displaced by the construction of the tanks. We agree with the DEIS’s conclusion that this does not represent a significant adverse impact because these businesses should be able to relocate to similar spaces in the vicinity, and are not solely dependent on the specific location for their business operations. In addition, we note that at the Head End site, owners of the lots to be acquired by DEP have previously considered offers by developers to purchase the properties, which would similarly displace businesses. Nevertheless we believe DEP should, as mitigation, offer assistance to displaced businesses in finding alternative locations through collaboration with EDC and Small Business Services and the Final EIS should note the scope of such efforts.

5. Historic Preservation

We believe the community goal to save the Gowanus Station building may be best achieved by siting the tank at the Head-of-Canal site. The property owner had previous development plans that did not include preserving the building, and there is no landmark designation in place to require preservation. As the DEIS notes, the city has the opportunity to thoughtfully integrate the building into the head house design. The FEIS should incorporate as much detail about these plans and opportunities as possible at this stage.

<u>Owl’s Head Site</u>

For the past 7 years, Gowanus Canal Conservancy (GCC) has operated a composting, stewardship and education facility and native plant nursery at the Salt Lot, the site of the future Owl's Head tank. We appreciate the city's intent to incorporate GCC into the long term design of the site. **The City should assist GCC in securing a temporary site for these uses while displaced during construction so that GCC may continue to offer community programming, open space stewardship and compost production.**

Additionally, the site includes a number of demonstration gardens and habitats installed by GCC, including a salt marsh installation that is acknowledged in the DEIS on *page S-25*. GCC urges the city to incorporate high quality open space and restoration areas in the design that **provide public access to the waterfront and increase habitat along this highly degraded waterway**. Opportunities to do so include:

- Reconstruction of the bulkhead at Owl's Head should consider soft edges to improve shoreline habitat. Strategies like this should be coordinated with the related Natural Resources Damages (NRD) legal settlement to mitigate loss of resources through restoration projects.
- On page 5-5, the DEIS refers to the dead end of 2nd Avenue, where a garden and access point for boaters are currently located, that will be displaced with the reconstruction of the bulkhead. Since the city is proposing moving the 007 outlet to the west, there is an opportunity for the city to rebuild the street end as an educational amenity with a sponge park to soak up storm water and a reconstructed boat launch.

Thank you for the opportunity to comment and for your thoughtful consideration of these comments in drafting the Final Environmental Impact Statement.

Sincerely,

Sabine Aronowsky
Program Manager
South Brooklyn Accountable Development Initiative
Fifth Avenue Committee

Michael Higgins, Jr.
Organizer
Families United for Racial and Economic Equality

Rachel Spector
Director of Environmental Justice Program
New York Lawyers for the Public Interest

Sue Wolfe
President
Friends of Thomas Greene Park

Andrea Parker
Executive Director
Gowanus Canal Conservancy

From: Peter Reich [mailto:swiftfolders@gmail.com]
Sent: Monday, January 29, 2018 11:30 PM
To: Lucas, Rasheed <RLucas@dep.nyc.gov>
Subject: comments on the Gowanus Canal CSO Facility (ULURP Application # C180065 PCK).

Comments on NYC Department of Environmental Protection's Uniform Land Use Review Procedure application relevant to site selection and acquisition of property located at 242 Nevins Street, 234 Butler Street, and 270 Nevins Street for a combined sewer overflow control facility, commonly referred to as the Gowanus Canal CSO Facility (ULURP Application # C180065 PCK).

Dear DEP,

I thank your office and the City Planning Commission for this opportunity to submit comments on the ULURP application for the site acquisition of property located at 242 Nevins Street, 234 Butler Street, and 270 Nevins Street (the Head-of-Canal site) for the Northern Combined Sewer Overflow (CSO) facility, required by EPA as part of the Gowanus Superfund cleanup.

I have already stated my concern verbally that there be a concerted effort made to mitigate noise and vibration during the whole demolition and construction process. I speak for all of the live/work artists in residence and tenants of 280 and 285 Nevins Street, the 2 buildings singled out in the DEIS as most likely to be impacted by this project.

That statement used all of my allotted 3 minute public speaking time.

I would also like to urge you to fully consider designing the top of the completed CSO tank for more than strictly passive recreation. This is a tremendous opportunity to maximize use of the huge flat upper surface of the tank and transfer several recreational activities currently provided on the paved portions of Thomas Green Park- specifically the skateboard park, handball courts, and perhaps even a small basketball court can be built on the tanks, while still allowing access to necessary rooftop access hatches.

The goal here is to allow more of the full city block that is Thomas Greene Park to be reverted into an exceedingly large natural dirt and grass bioswale after it's remediation by National Grid. This would contribute significantly to managing local storm water runoff before it gets to the sewers, and then into the new CSO tank.

All in all, this move would help to extend the capacity of the tank without making it larger than currently designed, and would provide more much-needed welcoming functional green park space for the neighborhood.

Thanks for your consideration-

Sincerely,

Peter Reich

280 Nevins Street

Brooklyn, NY 11217

David Yudelson
Direct: (646) 378-7219
dyudelson@sprlaw.com

January 29, 2018

VIA EMAIL

Rasheed Lucas, Project Manager
Bureau of Environmental Planning and Analysis,
New York City Department of Environmental Protection
59-17 Junction Blvd,
11th Floor
Flushing, NY 11373-5108
rlucas@dep.nyc.gov

Re: Comments on the DEIS for the Gowanus Canal Combined Sewer Overflow ("CSO") Facilities Project

Dear Mr. Lucas:

These comments are submitted on behalf of landowners, tenants and other parties directly affected by the proposed project. These comments are on the Draft Environmental Impact Statement ("DEIS") for the Gowanus Canal Combined Sewer Overflow ("CSO") Facilities Project (the "Project"), published by the New York City Department of Environmental Protection "NYCDEP") in September 2017, pursuant to the State Environmental Quality Review Act ("SEQRA") and the City Environmental Quality Review Act ("CEQR") (CEQR No. 17DEP040K).

The Project involves NYCDEP's siting of CSO retention tanks at locations near the Gowanus Canal in order to comply with an order of the U.S. Environmental Protection Agency in connection with the cleanup of the Gowanus Canal. The DEIS states that NYCDEP's preferred alternative for the Project is to site CSO retention tanks at two locations, the "Head End Facility" near the head of the Gowanus Canal and the "Owls Head Facility" near the Sixth Street Turning Basin. Construction of the Head End Facility would require either the use of the New York City-owned Thomas Greene Park or the acquisition of three privately-owned parcels, 242 Nevins St., 234 Butler St., and 270 Nevins St. The Owls Head Facility allegedly requires the taking of numerous privately owned parcels. The DEIS has determined that the acquisition of the privately-owned parcels is the preferred alternative for siting the facilities.

However, the DEIS suffers from numerous fatal defects under both SEQRA and CEQR. Those deficiencies must be corrected before NYCDEP may take any further action to advance the Project and before any city or state funding or permits may be issued.

I. Land Use & Zoning Impacts

A fundamental flaw, which skews every category of impact analysis, is that the DEIS fails to incorporate into its projections the rezoning of the Gowanus neighborhood which is expected to occur in the near future. Instead, the DEIS simply states that "the existing zoning regulations and associated current patterns and trends applicable to the Head End Site, the Owls Head Site, and the study areas are assumed to remain in place in the 2028 analysis year." DEIS, S-3.

This is belied by the many clear indications that the zoning of the neighborhood is likely to change, perhaps as soon as next year. In October 2016, the New York City Department of City Planning launched the Gowanus PLACES (Planning for Livability, Affordability, Community, Economy Opportunity, and Stability) Neighborhood Planning Study.[1] Among the goals of the study is developing land use proposals, including a rezoning, to promote increased housing in the Gowanus neighborhood. Indeed, the study has been referred to in the media as the "study to rezone Gowanus."[2] This study builds on the earlier Bridging Gowanus study, which was a community-driven planning exercise from 2013-2015, convened by New York City Council members and other elected officials.[3] The Bridging Gowanus study also anticipated a neighborhood rezoning to increase residential uses in Gowanus.

The anticipated rezoning has also been reflected in the media and in the markets. Daniel Geiger, "Gowanus warehouse sold as developers await rezoning," *Crain's*, December 15, 2017, ("For years there was talk that Gowanus would be rezoned...But pricing has picked up as buyers have become more confident the rezoning is more imminent now. The expectation is that it's going to happen next year.")[4]; Andy Newman, "Can Gowanus Survive Its Renaissance?" *New York Times*, October 13, 2017, ("Most important, the city is preparing to unleash a force held largely at bay for the first two decades of the Gowanus renaissance: residential development. Next year, officials expect to propose a broad plan that calls for, among other things, rezoning 43 blocks to allow more buildings like the 12-story high-rise complex on Bond Street[.]")[5]; Daniel Geiger, "Rezoning could create 'Venice' on the Gowanus Canal," *Crain's*, December 28, 2016.[6]

Accordingly, the DEIS must analyze how this anticipated rezoning will affect and interact with the Project's effects across every category of SEQRA and CEQR impact. Critically,

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[1] *Available at* https://www1.nyc.gov/site/planning/plans/gowanus/gowanus-updates.page.
[2] *See*, *e.g.*, https://ny.curbed.com/2016/10/7/13201796/gowanus-rezoning-study-october-27-start.
[3] *Available at* http://bridginggowanus.org/.
[4] *Available at* http://www.crainsnewyork.com/article/20171215/REAL_ESTATE/171219912/development-firm-buys-gowanus-warehouse-with-an-eye-on-upcoming-rezoning.
[5] *Available at* https://www.nytimes.com/2017/10/13/nyregion/can-gowanus-canal-survive-its-renaissance.html.
[6] *Available at* http://www.crainsnewyork.com/article/20161228/REAL_ESTATE/161229930/could-a-rezoning-bring-a-little-venice-to-the-gowanus-canal-developers-and-council-members-hope-a-process-to-create-public-space-could-attract-infrastructure-and-clean-up-the-superfund-site-in-brooklyn.

with respect to land use changes, the DEIS must study how acquisition of the private parcels and the consequent elimination of their current manufacturing uses could, in conjunction with a likely rezoning, accelerate the de-industrialization of the neighborhood and the permanent loss of manufacturing uses. With respect to socioeconomic impacts and neighborhood character impacts, the DEIS must analyze how the preferred alternative's direct business displacements could similarly accelerate the process of displacement of other existing businesses and contribute to the alteration of the neighborhood's socioeconomic makeup. With respect to air quality and noise impacts, the DEIS must study how the potential odor and noise impacts of the Project would affect a rezoned neighborhood with a greater density of sensitive residential receptors clustered around the Project site and assess whether adequate mitigation measures can be deployed.

For all of the quantitative impact categories like traffic, air and noise the future without the project baseline must assume a reasonable worst case increase in the density of residential, commercial and industrial uses. This increase in density and the associated increase in population, pedestrians, sensitive receptors, vehicle trips, emissions and public transportation trips must be accounted for. Thus, the current analysis of impacts which assumed no change is fundamentally flawed.

II. Socioeconomic Impacts

An analysis of all impacts associated with the direct displacement of 19 businesses (some of which are vehicle intensive) is required. This analysis must look at reasonable relocation sites and the impacts that will be caused at the new locations. If there are no relocation sites then the loss of the business and their associated jobs and impact on community character must be assessed. The DEIS is incorrect in concluding that the unique businesses to be displaced (large vehicle related storage and services at both tank location sites) are available elsewhere on 3rd and 4th Avenues. To the contrary no comparable businesses that store and repair sanitation and tour bus vehicles on the scale required currently exist.

III. Historical Impacts

The DEIS also proposes constructing the Project on locations which contain historic resources within the Gowanus Canal Historic District that was proposed in 2014, and inadequately studies those impacts and potential mitigations. Notably, the preferred Head End site includes Block 411, Lot 24 (234 Butler Street), which is the former Gowanus Station. This building, which was constructed in 1926, bears the Seal of the City of New York and a terra cotta panel which reads "City of New York, Water Supply-Distribution, Gowanus Station.". It has been alleged to be a contributing to the proposed Gowanus Canal Historic District.

However, the DEIS states that existing buildings at the preferred Head End site, including Gowanus Station, will be demolished. DEIS, 7-16. The DEIS also states that "[i]f feasible," some or all of the Gowanus Station building will be preserved or relocated. DEIS, 7-18. This type of generalized statement does not meet SEQRA and CEQR's requirements for clarity and specificity in developing mitigation options. A definitive analysis of the building's value as a cultural resource and the impacts of the proposed action must be undertaken as part of the DEIS.

NYCDEP may not defer the impact analysis and study of mitigation options until the FEIS or after the preferred alternative for the Project has been selected.

IV. Alternatives Analysis Issues

For each location an alternative must be considered that assumes the parcels necessary for staging are available to DEP for use for staging without permanent fee title acquisition by the government. These alternatives would alter the DEIS impact analyses and the socioeconomic circumstances. The following are addition specific comments.

a) Cost Issues

Finally, the DEIS contains an inadequate comparative analysis of Project alternatives. To start, the DEIS should full and transparently analyze the cost to the City of each of the alternatives, and the selection of the preferred alternative should be informed by cost. This is required in order for the lead agency undertaken the socioeconomic balancing required by CEQR and SEQRA. The acquisition of the privately-owned parcels for the DEIS's preferred Head End site would be far more expensive for the City than the use of the Thomas Greene Park site which the City already owns. However, the DEIS fails to engage in analysis of these costs.

b) Remediation Issues

It improper to indicate that National Grid's MGP remediation plans are beyond the scope of the proposed project. Those remediation plans, including bulkhead work, and the proposed tanks are all part of the same Superfund remedy and are physically interrelated and dependent on one another. Thus, the scope of required remediation at all tank related locations must be defined and how that work is integrated and sequenced with the tanks' construction is required in order to properly assess adverse impacts and mitigation in not only the hazardous materials chapter but also the construction and natural resource chapters.

The DEIS alternatives analysis must also include in its weighing of alternatives the consideration that, during the Project's duration, National Grid will need to remediate the MGP site underlying the Thomas Greene Park, which will necessitate closing and excavating it. If the CSO tanks were to be sited in the park, their construction could be coordinated with the MGP remediation, likely accelerating remediation. This would halt the contaminants' ongoing seepage into the Canal more quickly, a public health and environmental safety consideration which the DEIS must engage with.

c) Resilience Issues

Additionally, the DEIS alternatives analysis fails to compare the resiliency of the Head End siting alternatives to climate change, flooding, and extreme weather. Both sites are within the 100-year flood plain of the Gowanus Canal, but on the privately-owned parcels, the Head End Facility would be sited directly next to the Canal and as such more vulnerable to flooding and extreme weather than the Park site, which is further inland. Construction of a facility with a substantial underground component directly next to a canal poses serious structural integrity concerns, particularly in extreme weather. The DEIS must be revised and supplemented to adequately address these concerns.

V. Conclusion

Due to the above-discussed deficiencies in information and analysis, the DEIS cannot serve its legally-mandated purpose under SEQR and CEQR of providing a basis for fully informed public comment on the Project. Consequently, the DEIS must be revised and completed, and it is only at this point that the public will be able to discern the actual scope and nature of the Project's impacts. Until the revisions necessary to attain compliance with SEQRA and CEQR are completed, NYCDEP may not take any action to advance the Project and no state permit or funding may be issued to the Project.

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Respectfully,

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