

CHAPTER 14: INFRASTRUCTURE

14.1 Overview

The Proposed Action would introduce a substantial number of new residents, employees and visitors to the Project Area, which would create an increase in the demand for water and sewage disposal and treatment over Existing Conditions. Water and sewage disposal services to the Project Area, as defined in Chapter 1, “Project Description,” are provided by the City of New York. This chapter presents and assesses the potential impacts of the operations of the Proposed Action on this infrastructure. For the purposes of this FEIS, the term infrastructure refers to water supply, sewage treatment, and stormwater management. The analysis examines the functioning and capacity of infrastructure within the Project Area.

As in most urbanized areas, a water supply system, a stormwater drainage and sanitary sewer network are available in this area.

New separate sanitary and stormwater collection and conveyance systems would be provided in the bed of Front Street. Sanitary flows from the Homeport Site would be discharged by means of the new sanitary sewer in Front Street to the existing interceptor sewer. Properties within the Project Area that are not part of the prior Homeport Site (primarily those west of Front Street between Thompson and Wave Streets) would be serviced with upgrades to the existing municipal storm and sanitary system, as required, per New York City Department of Environmental Protection (NYCDEP) specifications. The new separate storm sewer in Front Street would allow stormwater to bypass the interceptor system and be discharged directly to the Upper New York Bay via a new connection to the existing combined sewer overflow (CSO) outfall point. The connection would be made beyond the regulating chamber to avoid the storm flow from increasing the amount of combined sewage.

The Proposed Action would alleviate existing grading and drainage problems in Front Street and thus improve water ponding conditions in the street. It is anticipated that one new stormwater outfall would be necessary to handle stormwater flow from a low point in Front Street at the northern portion of the Project Area. Stormwater from the development on the Homeport Site would continue to be discharged into Upper New York Bay by means of seven existing internal storm drains within the site.

As detailed below, the Proposed Action would not result in significant adverse impacts to the water supply, sanitary sewer system, or stormwater discharge for the Project Area.

14.2 Methodology

CEQR Technical Manual methodologies have been applied in evaluating the potential infrastructure effects of the Proposed Action. Usage rates presented in the *CEQR Technical Manual* have been utilized to estimate the water demand and sewage

generation for the Existing, No Build and Build Conditions. The benchmark used to determine whether or not the Proposed Action would have a significant adverse impact is the difference between the No Build and Build Conditions.

The study area contains all property, including lands under water, pier structures and the bulkhead, bounded generally by Hannah Street to the north, the SIR tracks and Bay Street to the west, Bay/Edgewater Streets to the south, and the U.S. Pierhead line to the east.

14.3 Existing Conditions

14.3.1 Water Supply

The water supply system of New York City is operated by NYCDEP out of three watersheds: Croton, Delaware, and Catskill. The water supply system for New York City relies primarily on gravity to supply approximately 1.2 billion gallons per day (gpd) of water, via a system of reservoirs, aqueducts, and tunnels. A Citywide underground distribution network in the form of water mains further distributes water to consumers and fire hydrants. The water supply is primarily channeled via three tunnels, City Tunnels No. 1, 2 and 3 (Stage 1).¹ City Tunnel No. 2 travels through the Bronx, Queens and Brooklyn, and finally through the Richmond Tunnel in order to reach Staten Island. The Catskill/Delaware watershed is the primary source of the water that is distributed to Staten Island consumers.

Locally, there is an eight-inch water main in the bed of Front Street and various sized water mains in the east/west oriented streets between Front Street and Bay Street (from Wave Street to Thompson Street). Existing water usage within the Project Area has been estimated and is shown in Table 14-1.

14.3.2 Sanitary Sewer System

The municipal sewer system in New York City is comprised of a network of underground sewers that move wastewater to 14 treatment plants known as water pollution control plants, or WPCPs. Catchment areas are the areas that are served by each of the City's 14 WPCPs. Most of the City's sewer network is combined, in that it carries both sanitary sewage and stormwater loads. Portions of the municipal collection system in the region of the Proposed Action collect stormwater and sanitary sewage separately. The municipal sewer network, via gravity, discharges to the final conveyance pipe, an interceptor sewer that conveys its contents to the closest pump station, and from that point, to the WPCP via force main.

During wet weather, rainwater runoff flows may inundate the WPCPs, depending upon the size of the storm. To minimize this inundation, regulator chambers are built on the combined sewer system to divert excess combined flow to a CSO outfall. The City's WPCPs are designed to treat twice the amount dry weather flow so as to accommodate surges from minor storms.

¹ While Stage 1 of City Tunnel No. 3 is complete, the extension of this tunnel is currently under construction in Brooklyn and Queens.

NEW STAPLETON WATERFRONT DEVELOPMENT PLAN
FINAL ENVIRONMENTAL IMPACT STATEMENT

Staten Island is served by two WPCPs, Oakwood Beach and Port Richmond. The Port Richmond facility serves the North Shore and is located at 1801 Richmond Terrace. The Project Area is entirely within the service area of the Port Richmond WPCP; thus, Project Area sanitary sewage and stormwater is treated at the Port Richmond WPCP. Treated wastewater (effluent) is then discharged into the adjacent waters of the Kill van Kull. The WPCP operates under a State Pollution Discharge Elimination System permit (SPDES Permit No. NY0026107) issued by the New York State Department of Environmental Conservation (NYSDEC) to regulate the amount and quality of effluent from the plant. The Port Richmond WPCP is designed to treat a monthly flow of 60 million gallons per day (mgd). The average flow to this facility, approximately 35 mgd, is historically much less than the design flow.²

Specifically, the Project Area is served by a mixture of sanitary sewers, storm sewers, and combined (sanitary/storm) sewers. As described above, flows from these sewers, carried by gravity, eventually discharge to an interceptor sewer by first passing through a regulator chamber. At wet weather when the combined flow exceeds the twice dry weather design flows of the interceptor the diversion chamber within the regulator diverts the excess combined flow directly to the CSO outfall into the Upper New York Bay. During dry weather flows, the interceptor conveys the sewage to the Hannah Street sanitary Pumping Station, located at the foot of Hannah Street near Pier 6. From the pumping station, flows are conveyed via a force main to the Port Richmond WPCP.

Within the Homeport Site and on adjacent piers, sanitary flows are collected in separate sanitary sewers and conveyed to the interceptor which transmits the sewage to the Hannah Street Pumping Station. The properties within the Project Area and west of Front Street function similarly. The existing sanitary sewage generated by the Project Area has been estimated and is shown in Table 14-1.

14.3.3 Stormwater

Stormwater in the City streets within the Project Area is collected by catch basins and routed to the combined sewers. In addition, according to available records, within the Homeport Site and on adjacent piers and aprons that front the piers, most of the precipitation that falls is collected by means of existing internal stormwater drains and discharged directly into the Upper New York Bay from seven stormwater outfalls without entering the City sewer system.

The Project Area is served by existing storm sewers and drains, and combined sewers. Flows from combined sewers are carried by gravity to a regulator. At wet weather when the combined flow exceeds the twice dry weather design flows of the interceptor sewer, the diversion chamber within the regulator diverts the excess combined flow directly to the CSO outfall into the Upper New York Bay.

² USEPA Clean Water Needs Survey, 1996

Table 14-1: Estimated Sewage Generation and Water Usage for Project Area

	Square feet of Development, by Use Type			Sewage (gpd)	Water (gpd)
	Institutional	Manufacturing ²	Commercial ³		
Homeport Site¹	282,300	--	--	47,991	95,982
Projected Development Sites	--	8,628	66,715	19,970	32,778
Project Area Total	282,300	8,628	66,715	67,961	128,760

Notes:

¹ Includes square footage of active buildings on the Homeport Site (only six out of eight are active); assumes retail/public use rate for water usage (domestic and air conditioning)/sewage generation.

² Manufacturing use assumes 1 gallon per square foot of development for domestic water use, 0.17 per square foot for air conditioning water use, and 0.17 per square foot for sewage generation.

³ Existing commercial uses assume retail/public use rate for water usage (domestic and air conditioning)/sewage generation.

Source: The Louis Berger Group, Inc. 2006

14.4 No Build Condition

14.4.1 Water Supply

In 2015, without the Proposed Action in place, the conditions of the overall water supply to New York City are not expected to change significantly. The City is committed to maintaining adequate water supply and pressure to all users. The City also has a comprehensive water conservation program in place that includes water metering and requirements for use of low-flow fixtures in new construction and renovation. Additionally, the City has an ongoing leak detection program and locking fire hydrants aimed at saving water. NYCDEP has projected that the savings in water utilization from these conservation measures would outpace the increased demand expected in the next decade. Additionally, Stage 2 of City Water Tunnel No. 3 is under construction. When completed, Tunnel No. 3 will improve the overall water supply system and allow maintenance of the two existing water tunnels to occur.

In the No Build Condition, several facilities that currently utilize the Homeport Site on a temporary basis would be relocated, including the New York City Police Department (NYPD) Staten Island Taskforce, New York City Fire Department (FDNY) Marine Company No. 9, New York City Department of Transportation (NYCDOT) Marine Repair Unit, and the Richmond County State Supreme Court, leaving the Site vacated. These facility relocations are independent of and unrelated to the Proposed Action. As a result, the No Build water utilization rate in the Project Area would decrease relative to Existing Conditions.

It is assumed in the No Build Condition that the existing uses in the remainder of the Project Area (west of Front Street between Wave and Thompson Streets) would remain. None of the Projected Development Sites within the Project Area, as defined in Chapter 2, "Analytical Framework," would be developed in the No Build Condition. However, there would be an increase in water demand relating to any background growth that may occur within the region, including the ten anticipated development projects identified in

Chapter 2. Estimated water demand under the No Build Condition is approximately 32,778 gpd, or approximately 95,982 gpd (71 percent) less than Existing Conditions.³

14.4.2 Sanitary Sewer System

Without the Proposed Action, the amount of sewage generated in the Project Area would decrease since the uses currently present on the Homeport Site would be relocated and the structures housing them removed. There would, however, be an increase in demand on the municipal sewer system relating to any background growth that may occur within the region, plus the ten anticipated development projects. The existing grading and drainage problems that exist along Front Street would not be resolved in the No Build Condition since the Proposed Action would not be in place. Estimated sewage generation under the No Build Condition is approximately 19,970 gpd, or approximately 47,991 gpd (74 percent) less than Existing Conditions. Additionally, the existing sanitary and combined municipal sewer system would remain unchanged.

14.4.3 Stormwater

While the details of demolition are not currently known, the amount of impervious surface area would remain essentially the same in the No Build Condition as in Existing Conditions. The structures that temporarily house the NYPD, NYCDOT, FDNY and Supreme Court uses would be removed and the paved surfaces that the buildings stand on would likely remain. Stormwater that would fall on impervious surfaces within the Project Area would be conveyed to Upper New York Bay, untreated, in the same manner discussed under the existing conditions section. Additionally, the existing stormwater and combined municipal sewer system would remain unchanged.

14.5 Build Condition

14.5.1 Water Supply

While design of the infrastructure improvements that accompany the Proposed Action are not yet finalized, it is anticipated that a new 20-inch water main would be installed in the bed of Front Street to replace the existing eight-inch main (this is subject to review and acceptance by NYCDEP). The demand for water would increase due to the additional demand generated by the Proposed Action. As indicated in Table 14-2, the Project Area's estimated water consumption would be approximately 246,354 gpd with the Proposed Action in place. This amount represents an increase of approximately 117,594 gpd (91 percent) over Existing Conditions and approximately 213,576 gpd (652 percent) over the No Build Condition. The new 20-inch water main that would be installed in the bed of Front Street would have the available capacity to supply this volume of water to the Proposed Action. This amount of water represents a small fraction of the overall supply for the City or for Staten Island.

³ As the No Build Condition assumes a vacant and vacated Homeport Site, the estimated water usage amount (and sewage generation amount) under the No Build Condition is equal to that of the Projected Development Sites under Existing Conditions (or the total existing amount of water usage/sewage generation less the Homeport Site contribution).

14.5.2 Sanitary Sewer System

The estimated amount of sanitary sewage generated by the Proposed Action would be approximately 200,825 gallons per day (see Table 14-2). This is approximately 132,864 gpd (196 percent) above the existing generation level and approximately 180,855 gpd (906 percent) above the anticipated No Build level. (Note: the numbers for water consumption are higher than the numbers for sanitary sewage since the calculations in the *CEQR Technical Manual* take into account factors such as evaporative loss to air conditioning, landscape use, etc.)

Separate sanitary and storm municipal sewer systems would be designed for the Proposed Action, in a manner consistent with the intent of the NYCDEP Drainage Plan. Sanitary flows from residential connections within the Project Area limits would be conveyed to separate sanitary sewers, which eventually discharge their contents to the existing interceptor beneath Front Street. Interceptor sanitary flows are conveyed northward to the Hannah Street Pumping Station, which ultimately discharges to the Port Richmond WPCP. Modifications would be made to the Drainage Plan and submitted to the NYCDEP in the form of an Amended Drainage Plan, to reflect the changes to mapped City streets and modifications to the existing municipal sewers that are part of the Proposed Action.

Sanitary sewage from the properties west of Front Street, between Thompson and Wave Streets, would be directed to separate sanitary sewer pipes in the bed of the cross streets. Sanitary sewers would then be connected to the 42- and 60-inch interceptor in Front Street. The sewage would be conveyed to the Hannah Street Pumping Station and then pumped to the Port Richmond WPCP for treatment and disposal.

Sanitary sewage from the properties to be developed on the Homeport Site would be collected by internal sanitary drains which would discharge to a sanitary sewer(s) which would be connected at manhole(s) to the 42-, 60-, and 66-inch interceptor sewer in Front street. The sewage would be pumped to the Hannah Street Pumping Station and then pumped to the Port Richmond WPCP for treatment and disposal.

Parcel A at the north end of the Homeport Site is located over the 66-inch interceptor sewer which leaves the Front Street alignment and runs across the parcel to the Hannah Street Pumping Station. An easement corridor approximately 37 feet wide would be established to allow access to this section of the interceptor line. No permanent buildings would be constructed within this easement corridor.

14.5.3 Stormwater

While design for the parcels on the Homeport Site is not finalized, the use of more pervious surfaces would be incorporated in the open spaces and parking areas. By use of features such as bioswales and permeable pavement, the amount of stormwater requiring disposal from this the Homeport Site to the Upper New York Bay would be lessened as a result of the Proposed Action. A drainage system for the Homeport Site would be designed to convey any stormwater that does not percolate into the pervious surfaces to

**NEW STAPLETON WATERFRONT DEVELOPMENT PLAN
FINAL ENVIRONMENTAL IMPACT STATEMENT**

one of seven existing internal stormwater outfalls subject to permitting requirements by the NYSDEC.

One of the goals of the Proposed Action is to improve grading and drainage in Front Street to prevent ponding of stormwater, and create separate stormwater and sanitary conveyance system to minimize impacts to the Port Richmond WPCP.

The stormwater collection system design is conceptual at this point but certain elements of the design are known and are discussed below. The design would allow stormwater from the properties west of Front Street, between Thompson and Wave Streets, to be conveyed to separate, municipal stormwater sewer lines, which would be provided in the bed of each cross street during redevelopment. Upgrades to the existing City storm sewer would be in adherence with NYCDEP regulations, standards and specifications. This stormwater would be conveyed via gravity to a new separate storm sewer to be provided in the bed of Front Street. Stormwater would be conveyed to the existing CSO outfalls on the downstream side of the existing regulating chambers - but upstream of the tide gates – to prevent new stormwater flows from adding to the combined sewer flows. In locations where the tide gate is an integral part of an existing regulating chamber, new tide gates would be designed and installed by the applicant, subject to NYCDEP and NYSDEC approvals, at the outfall discharge point and the regulator chamber would be replaced or modified as needed. Stormwater from a small low-lying stretch of the Front Street extension that can not flow via gravity to any existing CSO pipes, would require a new stormwater outfall. This outfall would be designed in compliance with NYSDEC and NYCDEP requirements and would allow stormwater from this area to discharge directly into the Upper New York Bay.

Table 14-2: Estimated Sewage Generation and Water Usage for Project Area, Build Condition

	Number of Residents	Square feet of Development, by Use Type			Sewage (gpd)	Water (gpd)
		Commercial (Other) ¹	Commercial (Retail) ²	Commercial (Office)		
Homeport Site	663	135,000	40,000 ³	75,000	132,356	170,456
Projected Development Sites	545	--	43,700	--	68,469	75,898
Project Area Total	1,208	135,000	83,700	75,000	200,825	246,354

Notes:

¹ “Commercial Other” use includes proposed restaurant/banquet hall use and sports complex uses. A rate of 0.17 gpd per square foot of development was used for water (domestic and air conditioning)/sewage estimates.

² Commercial retail use utilizes the water (domestic and air conditioning)/sewage generation rates for retail/public use.

³ Includes 10,000 square-foot proposed farmer’s market use (assumes general retail use generation rate of 79 lbs per employee).

Source: The Louis Berger Group, Inc. 2006.

NEW STAPLETON WATERFRONT DEVELOPMENT PLAN
FINAL ENVIRONMENTAL IMPACT STATEMENT

Additionally, the proposed design capacity of the new stormwater system would accommodate tributary input from upstream areas outside the Project Area limits, in accordance with the NYCDEP Drainage Plan.

Stormwater from the development parcels and open space that would be built on the Homeport Site would be disposed of by utilizing existing, internal non-municipal storm pipes and outfalls at the site in compliance with any NYSDEC requirements, including water quality protection measures such as oil/water separators and grit collection chambers.

14.6 Conclusion

The Proposed Action would increase water consumption within the Project Area by approximately 213,576 gpd (652 percent) over the No Build Condition. This amount of water is insignificant when compared to the overall supply for New York City or Staten Island. Thus, the Proposed Action would not result in any significant adverse impacts to the water supply available for the Project Area.

Relative to the No Build Condition, the Proposed Action would increase the amount of sanitary sewage generated within the Project Area by approximately 180,855 gpd (906 percent), and over the Existing Condition by approximately 132,864 gpd (196 percent), however this would not represent a significant adverse impact since the pipes and WPCP would both have the capacity to handle this additional volume. Sanitary sewage from the Homeport Site and the properties west of Front Street would be directed to the interceptor in the bed of Front Street via new sanitary sewers and private sanitary drains. Existing and proposed facilities would be able to accommodate these flows. Thus, the Proposed Action would not result in any significant adverse impacts to sanitary sewage facilities.

The Proposed Action would improve grading and drainage in Front Street to prevent ponding of stormwater. One new stormwater outfall would be anticipated at a low point near the north side of the Project area. A drainage system would be designed to convey stormwater from the Homeport Site, after treatment, utilizing the seven existing internal stormwater outfalls that are present along the Homeport Site waterfront. Stormwater from the Homeport Site is currently conveyed untreated to Upper New York Bay. The design of the Homeport Site would incorporate the use of more pervious surfaces in the open spaces and parking areas. By use of features such as bioswales, the amount of stormwater requiring disposal from this site to the Upper New York Bay would also decrease as a result of the Proposed Action.

Stormwater from the properties west of Front Street would be collected and transported to existing CSO outfalls downstream of the existing regulator chambers and into the Upper New York Bay. Tide gates would be installed or improved as needed so that water from the Upper New York Bay would not flood the storm sewer network. Thus, since there would be no increase in stormwater to the combined sewer, and no increase in CSO, and since the storm collection and disposal system would be developed in compliance with any NYSDEC requirements, including water quality protection measures such as

NEW STAPLETON WATERFRONT DEVELOPMENT PLAN
FINAL ENVIRONMENTAL IMPACT STATEMENT

oil/water separators and grit collection chambers, there would be no significant adverse impacts.