Chapter 10: Water and Sewer Infrastructure

10.1 Introduction

This chapter assesses the potential effects of the Proposed Actions on the City's water supply, wastewater (sanitary sewage), and storm water management infrastructure in accordance with the *CEQR Technical Manual*. The purpose of the Water and Sewer Infrastructure analysis is to determine whether the Proposed Actions may adversely affect the City's water distribution or sewer systems. The *CEQR Technical Manual* guidelines indicate that a preliminary infrastructure analysis is needed if the project would result in an exceptionally large demand for water (e.g., those that are projected to use more than one million gallons per day (gpd) such as power plants, very large cooling systems, or large developments); or if the project is located in an area that experiences low water pressure (e.g., areas at the end of the water supply distribution system such as Rockaway Peninsula and Coney Island). New York City sewers are sized and designed based on area zoning and population density, as well as surface coverage characteristics; therefore, the Proposed Actions, which would result in the introduction of new population to the Affected Area warrant a preliminary evaluation of the City sewers infrastructure.

As described in Chapter 1, "Project Description," the Proposed Actions would affect an approximately 46-block area primarily along major corridors — East Tremont Avenue, White Plains Road, Bronxdale Avenue, Eastchester Road, and Stillwell Avenue — near the future Parkchester/Van Nest and Morris Park Metro-North stations in Bronx Community Districts 9, 10, and 11 (the "Affected Area"). The approximately 28-block area closest to the future Parkchester/Van Nest station is generally bounded by Baker Avenue and Van Nest Avenue to the north, Silver Street to the east, East Tremont Avenue to the south, and St. Lawrence Avenue to the west. The approximately 18-block area closest to the future Morris Park station is generally bound by Pelham Parkway to the north, Marconi Street to the east, Williamsbridge Road to the south, and Eastchester Road to the west.

The following sections present the existing conditions, the future conditions without the Proposed Actions (No-Action condition), and the future conditions with the Proposed Actions (With-Action condition). Calculations for water, wastewater, and stormwater flows are presented, and the expected impact is analyzed and discussed, based on standard City development requirements as well as regulatory conditions.

10.2 Principal Conclusions

The Proposed Actions would not result in significant adverse impacts on the City's water supply, wastewater or stormwater conveyance and treatment infrastructure based on the preliminary infrastructure analysis as described below. However, the Proposed Actions would introduce a mixture of land uses in amounts greater than the thresholds provided in the *CEQR Technical Manual* for the water supply and wastewater infrastructure; thereby warranting preliminary studies for the impacts to the

water supply system and the combined sewer and stormwater (CSS) analysis. The Proposed Actions exceeds the incremental developmental thresholds set in Chapter 13 of the *CEQR Technical Manual* as follows:

- The project will generate a large demand for water (e.g., the increase in water demand will be more than one million gpd).
- The Affected Area is in a combined sewer area and would exceed the 400 residential units over the predicted No-Action scenario.

A preliminary analysis of the impacts of the Proposed Actions on the New York City water supply system is included in this chapter. The preliminary analysis includes impact study of the effect of the additional demand from the Proposed Actions on the City's overall capacity of the water supply. The preliminary analysis does not include the study of the water mains (diameters or pressures) that the proposed services would be tied into from the proposed site. During the connection permit process, it is expected that the New York City Department of Environmental Protection (NYCDEP) will confirm that capacities of the water mains are sufficient to handle the additional demand from the Proposed Actions.

The sanitary sewage generation and its potential impact on Hunts Point Wastewater Resource Recovery Facility (WRRF) are also analyzed in this chapter. This section includes the analysis of the capacity of the Wastewater Treatment Plant but does not include the analysis of the capacities of the local combined sewers, regulators in the Affected Area. During the connection permit process, it is expected that NYCDEP will confirm that capacities of the combined sewers are sufficient to handle the additional demand from the Proposed Actions.

As per the preliminary analysis, combined sewer overflows (CSO) affected by the Proposed Actions will not have adverse impacts to the combined stormwater and sanitary system. However, additional runoff generated from the Proposed Project can be minimized into the combined sewer system by using Best Management practices identified in the section *Stormwater Best Management Practices*.

Further, the developer of the projected development sites will be responsible for submitting the water and sewer connection permit applications to NYCDEP at which time, NYCDEP will be reviewing the applications prior to construction.

WATER SUPPLY

According to the assessment of the limited existing water infrastructure, the Proposed Actions would not result in significant adverse impact on the City's water supply system. The 60 projected development sites are expected to require approximately 4,563,818 gpd, a 2,726,614 gpd incremental increase over the No-Action condition. Preliminary assessment of the impact of the Proposed Actions on the potable water infrastructure concluded that there would be no significant adverse impact because the increment in water demand is approximately 2.7 million gallons per day (MGD) and it is expected that there would be adequate water service to meet the incremental demand, when considering that this is approximately 0.23 percent of the City's daily demand. As a result, no adverse effects are expected for the capacity of the NYC's water supply. Additionally, for each projected development site, water services connections

would be confirmed during the New York City Department of Buildings (DOB) permitting process. There is no information of low pressure in the existing system, but further research will be required when water tap permits are requested by each proposed developed site in order to comply with the rules governing and restricting the use and supply of water.

WASTEWATER TREATMENT

With the Proposed Actions, development on the 60 projected development sites is expected to generate approximately 3,616,999 gpd of wastewater, an incremental increase of 2,366,639 gpd over No-Action conditions. With the Proposed Actions, wastewater from the projected development sites would continue to be treated as it is now, in the Hunts Points WRRF. This additional flow of wastewater is not expected to cause a significant adverse impact to wastewater treatment infrastructure, because this WRRF has a dry weather design flow capacity of 200 MGD and is currently receiving 132.2 MGD on average (see Table 10-2, "Monthly Average Daily Maximum Flows, Hunts Point WRRF"). Phase III of a multiphase project to upgrade the plant and replace facilities that are nearing the end of their useful life is underway per CEQR # 05DEP023X. Based on the average flow, the WRRF currently has an average reserve capacity of 67.8 MGD. Therefore, the Hunts Point WRRF, would continue to have a reserve in treatment capacity, even with the Proposed Actions.

STORMWATER AND DRAINAGE MANAGEMENT

The 60 projected development sites identified in the Reasonable Worst-Case Development Scenario (RWCDS) are located within the Hunts-Point combined sewer sewershed. Small portions of the Affected Area are located within the Soundview and Throgs Neck sub-sewersheds, with most of the projected development sites being located inside the East Bronx sub-sewershed limits. Four different CSO outfalls serve the Affected Area and Projected Development Site 29 is within the separate sewer service area. Depending on the rainfall volume and duration, the total volumes to the Hunts-Point combined sewers produced by the projected sites would range from 0.023 to 2.849 million gallons (MG). In a similar manner, the separate sewer served area would generate a total rainfall volume ranging from 0.081 to 3.004 MG. Compared to the no-build scenario discharge volumes to the combined sewer systems, the sewersheds would have an increase ranging from 0.020 to 0.869 MG, during storm events with up to 2.5 inches of rainfall. Because all projects included in the calculations of the Proposed Actions are located along a 2.2 mile stretch of East Tremont Avenue and Eastchester Road, this increased flow to the City's combined sewer system may be discharged as CSOs through one or more of the four identified CSOs that service the area. The potentially impacted CSO outfalls are HP-007, HP-013, HP-0014, and HP-033, all discharging to the East River or its tributaries.

Based on detention requirements of the City's stormwater rule, it is concluded that the Proposed Actions would not result in significant adverse impacts to the wastewater and stormwater conveyance, and treatment infrastructure.

10.3 Methodology

The *CEQR Technical Manual* requires a preliminary water supply infrastructure analysis if the Proposed Actions result in an exceptionally large demand of greater than one MGD. In addition, a preliminary assessment for wastewater and stormwater conveyance and treatment is necessary when a proposed project located In the Bronx in a combined sewer area has greater than of 400 residential units (RUs), or 150,000 square feet (sf) of commercial development. The following methodology was conducted to assess the impact of the Proposed Actions based on the *CEQR Technical Manual*:

- Assess and describe the existing water, sewer and wastewater treatment infrastructure serving the Affected Area.
- A map delimiting the project extents, affected CSO drainage areas, sewershed and outfalls will be included as part of the analysis.
- Public GIS files from the NY Sewer Atlas (https://arcg.is/yfSyC) will be used to aid all mapping efforts.
- Estimate the water demand and wastewater generation, as well as stormwater runoff from the projected development sites with the Existing, No-Action, and With-Action Conditions.
- The water demand and wastewater generation calculations for residential, commercial and community facility zones are based on generation rates provided in the *CEQR Technical Manual*. Industrial zoning demand rates from previously approved rezoning EIS will be evaluated to select an appropriate water demand for the existing and No-Action scenarios.
- An area breakdown indicating the building footprint, as well as the unbuilt paved, and unbuilt unpaved areas in each site has been provided by New York City Department of City Planning (DCP). These areas will be used to enable the calculation of stormwater runoff generation.
- Stormwater runoff and wastewater flows per CSO area will be calculated using the volume Calculation Matrix, a spreadsheet-based procedure downloaded from the *CEQR Technical Manual* web site. As such, run-off and volume will be calculated based on rain events of up to 2.5 inches included in the NYCDEP Volume Calculation Matrix.
- Describe the planned No-Action infrastructure improvements, project components, and implementation schedules in the Affected Area, if any.
- Compare the effects of the With-Action scenario with the No-Action condition to determine the expected impact on the City's sewer infrastructure using criteria established in the *CEQR Technical Manual.*
- Wastewater and Stormwater estimated discharge for the With-Action scenario will be used to identify potential issues regarding limits approved per the Discharge Permit NY0026191, which includes all CSO outfalls affected by the rezoning footprint. If deficiencies are identified and a more detailed analysis of any stormwater or wastewater feature is required, it will be identified and a proposal for this out-of-scope work will be developed.

10.4 Existing Conditions

WATER SUPPLY

New York City draws water from three watersheds and a network of reservoirs, aqueducts, and tunnels extending as far north as approximately 125 miles from the City. Within the City, a grid of mains distributes water to individual buildings. NYCDEP operates the water supply system and the sewer system. The Delaware and Catskill systems collect water from the Catskill Mountains and deliver it to Kensico Reservoir in Westchester County, and then to the Hillview Reservoir in Yonkers. The Croton system collects water from Westchester and Putnam counties and delivers it to the Jerome Park Reservoir in the Bronx. From there, it is distributed to the Bronx and Manhattan through the New Croton Aqueduct, which travels beneath the Bronx and Manhattan. The Croton system has lower pressure than the Delaware and Catskill systems and supplies domestic uses primarily in the lower elevations of Manhattan and the Bronx.

The higher-pressure Delaware and Catskill systems serve all five boroughs and higher elevations where the water pressure of the Croton system would be inadequate. Of the three systems, the Croton watershed supplies an average of 10 percent of the City's water, primarily to users in the lower elevation portions of Manhattan and the Bronx. The Delaware and Catskill systems supply all five boroughs and typically deliver about 90 percent of the City's drinking water. Water is distributed to the City through three tunnels: City Tunnel Number 1, through the Bronx and Manhattan to Brooklyn; and City Tunnel Number 2, through the Bronx, Queens, and Brooklyn. A third tunnel, City Tunnel Number 3, is under construction. The projected sites are located in an area that currently has a grid of water distribution mains that are available to serve the Affected Area. There are no current water system capital projects planned in the Affected Area for the upcoming year.

Assessing the impact on water infrastructure from the Proposed Actions, requires to first estimate the water demand of the projected development sites. Estimates include residential, commercial, and institutional water demand for both domestic consumption and air conditioning. Table 10-1, "Water Demand and Wastewater Generation (Existing Conditions)," includes the calculation parameters obtained from the *CEQR Technical Manual*, and the resulting water demand flow (566,367 gpd).

Table 10-1: Water Demand and Wastewater Generation (Existing Conditions)

Land Use	Water Demand & Wastewater Generation Rates[1]	Area (sf) or Dwelling Units (DUs)	Domestic Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential	Domestic: 100 gpd/person	59[2]	16,000	0
Commercial/Office	Domestic: 0.24 gpd/sf	946,520	227,164	
	A/C: 0.17 gpd/sf		0	160,908
Community Facility	Domestic: 0.10 gpd/sf	23,990	2,399	0
	A/C: 0.17 gpd/sf		0	4,078
Industrial	Domestic: 10,000 gpd/acre[3]	389,967	89,524	0
	A/C: 0.17 gpd/sf		0	66,294
Total Water Demand			**566,367**	
Total Wastewater Generation			**335,087**	

1. Consumption rates obtained from the 2021 *CEQR Technical Manual* Table 13-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment," unless otherwise noted.
2. Per the RWCDS Matrix, a total of 160 people occupy the 59 D.U. in the Projected Development sites.
3. Based on 2014 East NY Rezoning FEIS, assuming no additional water demand from open storage.

Source: CSA Group, 2023.

WASTEWATER TREATMENT

Wastewater collection in the area utilizes a network of underground sewers installed along most of the streets in the Affected Area. This network is composed of collectors, interceptors, and trunk sewers convey the collected water to the Hunts Point WRRF for final treatment and disposal. The sewers in this zone of the Bronx are considered combined as they carry both wastewater, and stormwater. Because stormwater runoff is directly proportional to rainfall events, there may be extreme events that the sewer would be incapable of handling. To ensure continual operation of the collection system and avoid flooding in the area, the excess flow is diverted to the Westchester Creek using flow regulators and discharged through CSO outfalls for all projected development sites (except Projected Development Site 29, which drains into an adjacent separate sewer service area (where storm and sanitary sewage is carried separately). The diverted flow of wastewater, stormwater, and debris is considered an untreated discharge. These CSOs are regulated through the State Permit Discharge Elimination System (SPDES) number NY0026131, and constant monitoring is conducted to record the number of outflows occurring per month. Figure 10-1, "Projected Sites Sewershed," shows the limits of the combined sewer outfall drainage areas and the 60 projected development sites.

The Hunts Point WRRF is in the Hunts Point section of the Bronx, and treats wastewater from portions of the Bronx, Rikers Island, City Island, and Hart Island (see Figure 10-1, "Projected Sites Sewershed"). The service area to the Hunts Point WRRF is approximately 16,000 acres and includes an estimated population

of 755,948.[1] The WRRF has a design dry weather flow capacity of 200 MGD, and a maximum wet weather flow capacity of 400 MGD. The WRRF is an activated sludge facility and has been under a multiphase improvement project since 2007. Part of the last phase of the project has been included in contract HP-238 to undertake the construction of digesters, supporting buildings and infrastructure for the digesters and demolition of the existing ones. It is expected that construction on the digester will end by late 2025. Table 10-2, "Monthly Average Daily Maximum Flows, Hunts Point WRRF," below presents the monthly average and daily max discharge flow as reported in discharge monitoring reports (DMR) to the United States Environmental Protection Agency (USEPA). The monthly average flow is 393 MGD and the average of daily maximum flows is 134 MGD.

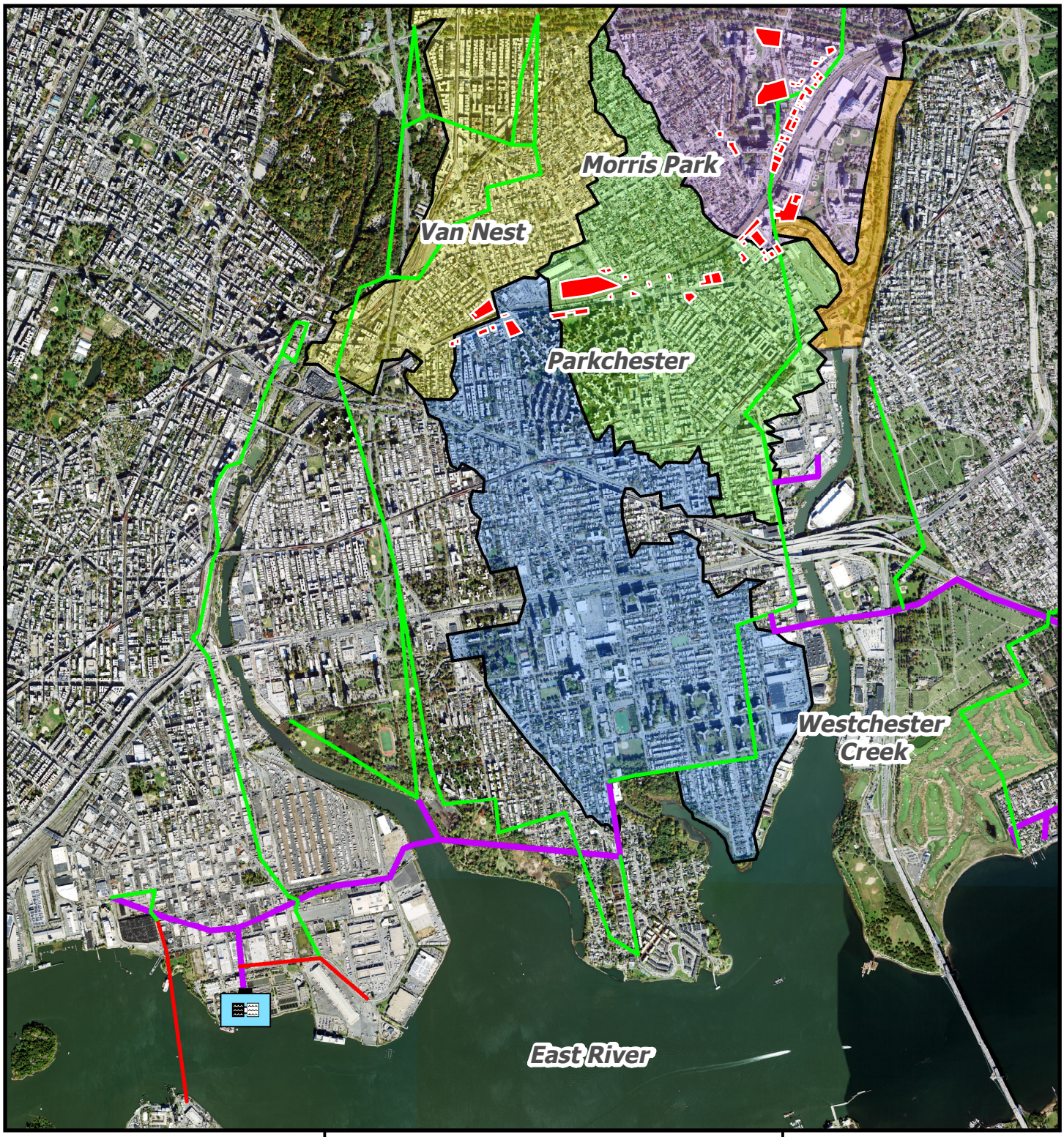
Assessing the impact on wastewater infrastructure from the Proposed Actions requires estimating the wastewater generation of the projected development sites. Table 10-1, "Water Demand and Wastewater Generation Rates (Existing Condition)," includes the calculation parameters obtained from the *CEQR Technical Manual* and resulting wastewater generation flow 335,087 gpd.

[1] 2020 population per the New York City Department of Mental Health and Hygiene, SARS-CoV-2 concentrations measured in NYC Wastewater | NYC Open Data (cityofnewyork.us).

Table 10-2: Monthly Average Daily Maximum Flows, Hunts Point WRRF

Date	Monthly Average Flow, MGD	Daily Max Flow, MGD
2/27/2020	342	127
3/30/2020	416	131
4/28/2020	419	129
5/29/2020	415	135
7/6/2020	360	121
7/31/2020	387	118
8/28/2020	420	138
9/29/2020	413	138
10/30/2020	424	128
11/30/2020	407	131
12/30/2020	411	133
1/29/2021	405	142
3/1/2021	401	138
3/26/2021	396	152
4/28/2021	399	137
5/28/2021	401	132
6/28/2021	410	130
7/30/2021	405	128
8/27/2021	408	150
9/29/2021	407	142
10/28/2021	412	160
11/30/2021	410	133
12/28/2021	324	116
1/28/2022	318	121
2/28/2022	417	138
3/28/2022	381	139
4/28/2022	380	131
5/27/2022	399	133
6/28/2022	397	132
7/28/2022	318	125
Average	**393**	**134**

Source: https://echo.epa.gov/effluent-charts#NY0026191; CSA Group, 2017.



Source: CSA Group 2023
1. Project Developed Sites by DCP
2. Sewer data is from Open Sewer Atlas NYC, 2022
3. Aerial is part of the 2021 USDA-NAIP National Agriculture Imagery Program

Hunts Points WWTP

Major Sewer Lines

- Combined Sewer
- Force Main
- Interceptor
- Projected Development Sites

Separate Sewer Service Area

CSO Drainage Area

- HP-007
- HP-013
- HP-014
- HP-033

N

0 2,50

Bronx Metro-North Rezoning

Figure 10-1

PROJECTED SITES SEWERSHED

Table 10-3: Existing Wastewater Generation on Projected Development Sites by Subcatchment Area

Subcatchment Area	Wastewater Generated on the Projected Development Sites (gpd)[1]
HP-007	13,617
HP-013	7,873
HP-014	108,262
HP-033	190,297
Separate Sewer System	15,038
Total	**335,087**

Note:
1. Outfall assigned based on NY City Open Sewer Atlas CSO Drainage Area Layer

Source: CSA Group, 2023.

STORMWATER AND DRAINAGE MANAGEMENT

The total area coverage of the projected development sites is approximately 1936,665 sf which is all located in the Hunts Point sewershed which drains to the East River. In terms of the projected development sites, 59 of 60 are served by four different combined sewer outfalls. These sites add up to 92.3 percent of the total area. Projected Site 29, which accounts for the remaining 7.7 percent of the total area, is located within the limits of the Bronx separate sewer service area. Projected Sites 1 and 5 are included within the boundaries of the Bronx River drainage area. Further, considerations about the proposed conditions of these two sites are included in Section 10.6, "The Future With the Proposed Actions (With-Action)." Table 10-4, "Drainage Area Surface Cover Assessment," shows the Drainage Area Surface Cover Assessment and the outfalls of each site. Unpaved areas have been combined into one single category defined as "Others."

Table 10-4: Drainage Area Surface Cover Assessment

Site (Projected)	Lot Area, SF[1]	Roof, SF[2]	Pavement, SF[2]	Others, SF	Outfall[2]	Site (Projected)	Lot Area, SF[1]	Roof, SF[2]	Pavement, SF[2]	Others, SF	Outfall[2]
1	11,039	11,039	0	0	HP-007	**31**	32,429	16,634	14,595	1,200	HP-014
2	7,845	7,845	0	0	HP-013	**32**	23,006	2,360	20,646	0	HP-014
3	21,096	11,916	9,180	0	HP-013	**33**	7,905	1,800	6,105	0	HP-014
4	10,075	9,000	1,075	0	HP-013	**34**	8,025	4,183	3,842	0	HP-014
5	101,244	19,300	15,496	66,448	HP-007	**35**	21,256	21,256	0	0	HP-014
6	7,987	1,872	6,115	0	HP-013	**36**	10,466	3,113	7,353	0	HP-014
7	69,743	0	0	66,719	HP-013	**37**	9,842	9,842	0	0	HP-014
8	73,486	66,375	7,111	0	HP-033	**38**	34,734	25,000	9,734	0	HP-014
9	346,432	325,300	18,977	2,155	HP-033	**39**	17,806	11,265	6,541	0	HP-014
10	7,439	0	6,100	1,339	HP-033	**40**	7,516	7,516	0	0	HP-014
11	10,627	1,900	8,727	0	HP-033	**41**	16,774	16,774	0	0	HP-014
12	9,955	1,200	8,755	0	HP-033	**42**	5,495	1,800	3,695	0	HP-014
13	9,064	7,866	1,198	0	HP-033	**43**	5,367	4,543	824	0	HP-014
14	12,572	5,000	7,572	0	HP-033	**44**	4,994	4,994	0	0	HP-014
15	7,232	4,000	3,232	0	HP-033	**45**	20,919	20,919	0	0	HP-014
16	6,801	1,400	1,401	4,000	HP-033	**46**	22,666	0	22,666	0	HP-014
17	31,937	6,815	18,122	7,000	HP-033	**47**	8,830	7,833	997	0	HP-014
18	37,123	10,706	26,417	0	HP-033	**48**	6,131	6,131	0	0	HP-014
19	47,035	6,970	32,065	8,000	HP-033	**49**	7,678	7,678	0	0	HP-014
20	20,806	2,602	17,204	1,000	HP-033	**50**	9,595	0	9,595	0	HP-014
21	10,950	0	9,150	1,800	HP-014	**51**	5,019	5,019	0	0	HP-014
22	40,981	37,914	3,067	0	HP-014	**52**	12,199	3,500	8,699	0	HP-014
23	6,988	3,750	3,238	0	HP-033	**53**	7,372	7,372	0	0	HP-014
24	58,500	58,500	0	0	HP-014	**54**	10,238	10,238	0	0	HP-014
25	8,427	0	8,427	0	HP-033	**55**	13,151	9,205	500	3,446	HP-014
26	8,068	7,248	820	0	HP-033	**56**	5,615	5,615	0	0	HP-014
27	12,534	12,534	0	0	HP-033	**57**	21,974	17,576	0	4,398	HP-014
28	21,398	2,050	19,348	0	HP-033	**58**	155,668	0	140,668	15,000	HP-014
29	148,469	62,660	85,809	0	SEPARATE	**59**	218,737	35,600	103,137	80,000	HP-014
30	29,301	15,000	14,301	0	HP-014	**60**	13,128	7,241	4,877	1,010	HP-014
						Total	1,939,690	975,769	697,381	263,515	-
						Percentage		50.3%	36.0%	13.6%	-

Notes:
[1]Lot areas provided by DCP
[2]Outfall assigned based on NY City Open Sewer Atlas CSO Drainage Area Layer

Source: CSA Group, 2023.

Calculations to estimate the existing conditions runoff per drainage service area (outfall) are detailed in Table 10-5, "Existing Projected Development Sites Runoff Coefficients," and Table 10-6, "Existing Stormwater Runoff and Wastewater Generation from the Projected Development Sites (Existing Conditions)."

Table 10-5: Existing Projected Development Sites Runoff Coefficients

Sub catchment Area	Surface Type[1]	Roof[2]	Pavement & Walks	Other[3]	Total
HP-007	**Area, %**	27%	14%	59%	100%
	Surface area, sf	30,339	15,496	66,448	112,283
	Runoff coefficient	1.00	0.85	0.85	0.89
HP-013	**Area, %**	27%	14%	59%	100%
	Surface area, sf	30,633	16,370	66,719	113,722
	Runoff coefficient	1.00	0.85	0.85	0.89
HP-014	**Area, %**	44%	44%	12%	100%
	Surface area, sf	386,421	390,992	106,854	884,267
	Runoff coefficient	1.00	0.85	0.85	0.92
HP-033	**Area, %**	69%	28%	3%	100%
	Surface area, sf	465,716	188,714	23,494	677,924
	Runoff coefficient	1.00	0.85	0.85	0.95
Separate Sewer	**Area, %**	42%	58%	0%	100%
	Surface area, sf	62,660	85,809	0	148,469
	Runoff coefficient	1.00	0.85	0.85	0.91
Total Area	**Area, %**	50%	36%	14%	100%
	Surface area, sf	975,769	697,381	263,515	1,936,665
	Runoff coefficient	1.00	0.85	0.85	0.93

Notes:
1. Runoff coefficients for each surface type are as per NYCDEP.
2. Total roof areas onsite assumed equal to the building footprint area provided by DCP
3. Estimate of unpaved areas provided by DCP.

Source: WS1_Surfaces Calculations, Calculation Matrix spreadsheet, *2021 CEQR Technical Manual*; NYCDEP; CSA Group, 2023.

Table 10-6: Existing Stormwater Runoff and Wastewater Generation from the Projected Development Sites (Existing Conditions)

Subcatchment Area	Rainfall (inches)	Duration (hours)	Total Area (acres)	Weighted Runoff Coefficient[1]	Stormwater Runoff (mg)[2]	Sanitary to CSS[3] (mg)	Total Volume to CSS (mg)
HP-007	0.00	3.80	2.58	0.89	0.000	0.002	0.002
	0.40	3.80			0.025	0.002	0.027
	1.20	11.30			0.075	0.006	0.081
	2.50	19.50			0.156	0.011	0.167
HP-013	0.00	3.80	2.61	0.89	0.000	0.001	0.001
	0.40	3.80			0.025	0.001	0.026
	1.20	11.30			0.076	0.004	0.079
	2.50	19.50			0.158	0.006	0.164
HP-014	0.00	3.80	20.3	0.92	0.000	0.017	0.017
	0.40	3.80			0.202	0.017	0.219
	1.20	11.30			0.606	0.051	0.657
	2.50	19.50			1.262	0.088	1.350
HP-033	0.00	3.80	15.56	0.95	0.000	0.030	0.030
	0.40	3.80			0.161	0.030	0.191
	1.20	11.30			0.483	0.090	0.573
	2.50	19.50			1.007	0.155	1.161
Separate Sewer	0.00	3.80	3.41	0.91	0.000	0.002	0.002
	0.40	3.80			0.034	0.002	0.036
	1.20	11.30			0.101	0.007	0.109
	2.50	19.50			0.211	0.012	0.224
Total Area	0.00	3.80	44.46	0.93	0.000	0.053	0.053
	0.40	3.80			0.447	0.053	0.500
	1.20	11.30			1.341	0.158	1.499
	2.50	19.50			2.793	0.272	3.066

Notes:

1. RAINFALL RUNOFF COEFFICIENTS used are composite rates per calculation

2. RUNOFF VOLUMES for EXISTING and WITH-ACTION condition have been calculated as follows:

QVOL = [RVOL x A x RC x 7.48GAL/1,000,000 MGD per GAL] - SVOL ; where

QVOL = Total Volume of Rainfall for 24-hour storm event discharged offsite (either to River or into CSS), in MG

RVOL = RAINFALL VOLUME, in Inches, for the corresponding RAINFALL RETURN PERIOD listed in WS2 in the EXISTING and PLAN Tables.

A = SITE AREA, in SQ. FT., as indicated in WS1 EXISTING and WITH-ACTION Tables for the various site areas.

RC = RAINFALL RUNOFF COEFFICIENT for each of the applicable Site Areas as per EXISTING and WITH-ACTION tables (refer to WS1).

Source: WS2_Volume Calculations, Calculation Matrix spreadsheet, *2021 CEQR Technical Manual*; NYCDEP; CSA Group, 2023

This information reveals that the existing condition at the projected development sites consist mainly of roofed or paved areas (86 percent). This means that the projected properties currently exhibit a high level of runoff generation potential.

10.5 The Future Without the Proposed Actions (No-Action Condition)

WATER SUPPLY

No infrastructure improvements or changes are planned for the water distribution system serving the Affected Area, and so the conditions related to infrastructure providing service to the Affected Area in the No-Action condition generally would resemble existing conditions.

Table 10-7, "Water Demand and Wastewater Generation (No-Action Condition)," includes revised development figures, together with the resulting daily estimates of water generated from the projected properties included in the Affected Area for the No-Action condition. For this condition, the 60 projected development sites are expected to add: 180 DUs; 296,730 sf of commercial/office/retail areas; 296,730 sf of community facilities; and industrial/warehouse spaces by 15,129 sf when compared to existing conditions. As described in Chapter 2, "Land Use, Zoning, and Public Policy," there are an anticipated 19 No-Build projects within a ¼-mile radius of the Affected Area. These No-Build projects will add: 1,141 residential DUs, of which 100,000 sf are planned to have A/C service, 266 hotel rooms, equivalent to 124,300 sf, 1,165,498 sf of commercial area, 7,100 sf of community facilities, 166,906 sf for industrial/warehouse space, and 10,100 sf of additional amenities including a little league field support building. The No-Action condition would result in the addition of 1,270,837gpd of water supply demand, when compared with the existing condition.

There is no information that indicates that there is insufficient capacity in the system to provide water under the existing condition, and the increase in demand of 1,270,837 gpd under the No-Action condition is not expected to not significantly reduce capacity under this scenario.

Table 10-7: Water Demand and Wastewater Generation (No-Action Conditions)

Land Use	Water Demand & Wastewater Generation Rates[1]	Area (sf) or DUs	Domestic Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential	Domestic: 100 gpd/person[2]	239	63,700	0
Commercial/Office	Domestic: 0.24 gpd/sf	1,243,250	298,380	0
	A/C: 0.17 gpd/sf		0	211,352
Community Facility	Domestic: 0.10 gpd/sf	229,777	22,977	0
	A/C: 0.17 gpd/sf		0	39,062
Industrial	Domestic: 10,000 gpd/acre[3]	405,096	92,997	0
	A/C: 0.17 gpd/sf		0	68,866
No-Build Projects within 1/4-mi: Residential[4]	Domestic: 100 gpd/person	1,141	399,350	
	A/C: 0.17 gpd/sf	100,000		17,000
No-Build Projects within 1/4-mi: Hotel[5]	Domestic: 100 gpd/person	266	53,200	
	A/C: 0.17 gpd/sf	124,300		21,131
No-Build Projects within 1/4-mi: Commercial	Domestic: 0.24 gpd/sf	1,165,498	279,720	
	A/C: 0.17 gpd/sf	1,165,498		198,135
No-Build Projects within 1/4-mi: Community Facility	Domestic: 0.10 gpd/sf	7,100	710	
	A/C: 0.17 gpd/sf	7,100		1,207
No-Build Projects within 1/4-mi: Others	Domestic: 0.10 gpd/sf	10,100	1,010	
	A/C: 0.17 gpd/sf	10,100		1,717
No-Build Projects within 1/4-mi: Industrial	Domestic: 10,000 gpd/acre[3]	166,906	38,316	
	A/C: 0.17 gpd/sf	166,906		28,374
		Total Water Demand	**1,837,204**	
		Total Wastewater Generation	**1,250,360**	

Notes:

1. Consumption rates obtained from the 2014 *CEQR Technical Manual* Table 13-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment," unless otherwise noted.
2. Considers a population of 637 residents (estimate provided by DCP).
3. Based on 2014 *East NY Rezoning FEIS*, assuming no additional water demand from open storage.
4. A 3.5 person/D.U. has been adopted for the purposes of this calculation.
5. A 2 occupant/D.U. has been adopted for the purposes of this calculation.

Source: CSA Group, 2023.

WASTEWATER TREATMENT

No wastewater treatment improvements or changes are planned for the area, and so the conditions related to infrastructure providing service to the Affected Area in the future without the Proposed Actions generally will resemble existing conditions.

Table 10-7, "Water Demand and Wastewater Generation (No-Action Condition)," includes the wastewater generation estimates for the No-Action condition, which amounts to 1,250,360 gpd. There are no reports of insufficient sewer system capacity in the Affected Area, but the capacity of the conveyance system will be evaluated in a per case basis during the connection permit process to NYCDEP. The increase in wastewater flow in the No-Action condition would not result in a significant adverse impact to wastewater conveyance or treatment infrastructure.

STORMWATER AND DRAINAGE MANAGEMENT

No infrastructure improvements or changes are planned for the stormwater and drainage management system serving the area, and so the conditions related to infrastructure providing service to the Affected Area in the future without the Proposed Actions generally will resemble existing conditions. However, calculations for the 60 projected development sites to be developed and 19 No-Build projects located within a ¼ mile buffer of the Affected Area are included in Tables 10-8, "Runoff Coefficients for No-Action Condition Projects," and Table 10-9, "Stormwater Runoff and Wastewater Generation of the No-Action Projects."

Table 10-8: Runoff Coefficients for No-Action Condition Projects

Sub catchment Area	Surface Type[1]	Roof[2]	Pavement & Walks	Other[3]	Total
HP-007	**Area, %**	30%	16%	54%	100%
	Surface area, sf	36,617	19,566	67,000	123,183
	Runoff coefficient	1.00	0.85	0.85	**0.89**
HP-013	**Area, %**	75%	25%	0%	100%
	Surface area, sf	114,552	38,569	0	153,121
	Runoff coefficient	1.00	0.85	0.85	**0.96**
HP-014	**Area, %**	48%	42%	9%	100%
	Surface area, sf	609,097	533,430	114,560	1,257,087
	Runoff coefficient	1.00	0.85	0.85	**0.92**
HP-033	**Area, %**	61%	34%	5%	100%
	Surface area, sf	595,226	335,704	44,403	975,333
	Runoff coefficient	1.00	0.85	0.85	**0.94**
Separate Sewer	**Area, %**	17%	35%	49%	100%
	Surface area, sf	315,602	655,512	914,978	1,886,092
	Runoff coefficient	1.00	0.85	0.85	**0.88**
Total Area	**Area, %**	38%	36%	26%	100%
	Surface area, sf	1,671,095	1,582,781	1,140,941	4,394,817
	Runoff coefficient	1.00	0.85	0.85	**0.91**

Notes:
1. Runoff coefficients for each surface type are as per NYCDEP.
2. Total roof areas onsite assumed equal to the building footprint area provided by DCP
3. Estimate of unpaved areas provided by DCP.

Source: WS1_Surfaces Calculations, Calculation Matrix spreadsheet, *2021 CEQR Technical Manual*; NYCDEP; CSA Group, 2023.

Table 10-9: Stormwater Runoff and Wastewater Generation of the No-Action Condition

Subcatchment Area	Rainfall (inches)	Duration (hours)	Total Area (acres)	Weighted Runoff Coefficient[1]	Stormwater Runoff (mg)[2]	Sanitary to CSS[3] (mg)	Total Volume to CSS (mg)
HP-007	0.00	3.80	2.83	0.89	0.000	0.003	0.003
	0.40	3.80			0.027	0.003	0.031
	1.20	11.30			0.082	0.010	0.092
	2.50	19.50			0.172	0.017	0.188
HP-013	0.00	3.80	3.58	0.96	0.000	0.037	0.037
	0.40	3.80			0.037	0.037	0.074
	1.20	11.30			0.112	0.110	0.222
	2.50	19.50			0.234	0.189	0.423
HP-014	0.00	3.80	28.85	0.92	0.000	0.034	0.034
	0.40	3.80			0.289	0.034	0.323
	1.20	11.30			0.867	0.100	0.968
	2.50	19.50			1.807	0.173	1.980
HP-033	0.00	3.80	22.39	0.94	0.000	0.074	0.074
	0.40	3.80			0.229	0.074	0.303
	1.20	11.30			0.687	0.221	0.907
	2.50	19.50			1.431	0.381	1.812
Separate Sewer	0.00	3.80	43.30	0.88	0.000	0.050	0.050
	0.40	3.80			0.412	0.050	0.462
	1.20	11.30			1.235	0.149	1.383
	2.50	19.50			2.572	0.257	2.829
Total Area	0.00	3.80	100.95	0.91	0.000	0.198	0.198
	0.40	3.80			0.994	0.198	1.192
	1.20	11.30			2.983	0.589	3.572
	2.50	19.50			6.216	1.016	7.231

Notes:
1. RAINFALL RUNOFF COEFFICIENTS used are composite rates per calculation
2. RUNOFF VOLUMES for EXISTING and WITH-ACTION condition have been calculated as follows:
QVOL = [RVOL x A x RC x 7.48GAL/1,000,000 MGD per GAL] - SVOL ; where
QVOL = Total Volume of Rainfall for 24-hour storm event discharged offsite (either to River or into CSS), in MG
RVOL = RAINFALL VOLUME, in Inches, for the corresponding RAINFALL RETURN PERIOD listed in WS2 in the EXISTING and PLAN Tables.
A = SITE AREA, in SQ. FT., as indicated in WS1 EXISTING and WITH-ACTION Tables for the various site areas.
RC = RAINFALL RUNOFF COEFFICIENT for each of the applicable Site Areas as per EXISTING and WITH-ACTION tables (refer to WS1).

Source: WS2_Volume Calculations, Calculation Matrix spreadsheet, *2021 CEQR Technical Manual*; NYCDEP; CSA Group, 2023

10.6 The Future With the Proposed Actions (With-Action Condition)

WATER SUPPLY

Table 10-10, "Water Demand and Wastewater Generation (With-Action Condition)," includes development estimates for the With-Action condition, together with the resulting daily estimates of water generated from the projected development sites included in the Affected Area. In the future with the

Proposed Actions, the Affected Area is expected to add: 7,474 DUs; 1,231,973 sf of commercial/office/retail areas; 1,290,628 sf of community facility space; and to eliminate 405,096 sf of industrial/warehouse space. This results in the addition of 2,726,614 gpd of water demand, when compared to the No-Action condition for the 60 projected development sites, representing an increase of approximately 144 percent, an approximately 0.23 percent increase of the City's daily demand (1.2 billion gpd).

The existing water supply capacity available in the City is sufficient to supply the additional demand in the With-Action condition. Further research will need to be conducted once the industrial areas are replaced by residential buildings to assess if local water system projects are needed to supply water at an acceptable level of service.

Table 10-10: Water Demand and Wastewater Generation (With-Action Condition)

Land Use	Water Consumption & Wastewater Generation Rates[1]	Area (sf) or DUs	Domestic Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential	Domestic: 100 gpd/person[2]	7,713	2,098,600	0
Commercial/Office/ Retail[3]	Domestic: 0.24 gpd/sf	2,475,223	594,053	
	A/C: 0.17 gpd/sf		0	420,787
Community Facility[4]	Domestic: 0.10 gpd/sf	1,520,405	152,040	0
	A/C: 0.17 gpd/sf		0	258,468
Industrial/ Warehouse	Domestic: 10,000 gpd/acre[3]	0	0	0
	A/C: 0.17 gpd/sf		0	0
No-Build Projects within 1/4-mi: Residential[4]	Domestic: 100 gpd/person	1,141	399,350	
	A/C: 0.17 gpd/sf	100,000		17,000
No-Build Projects within 1/4-mi: Hotel[5]	Domestic: 100 gpd/person	266	53,200	
	A/C: 0.17 gpd/sf	124,300		21,131
No-Build Projects within 1/4-mi: Commercial	Domestic: 0.24 gpd/sf	1,165,498	279,720	
	A/C: 0.17 gpd/sf	1,165,498		198,135
No-Build Projects within 1/4-mi: Community Facility	Domestic: 0.10 gpd/sf	7,100	710	
	A/C: 0.17 gpd/sf	7,100		1,207
No-Build Projects within 1/4-mi: Others	Domestic: 0.10 gpd/sf	10,100	1,010	
	A/C: 0.17 gpd/sf	10,100		1,717
No-Build Projects within 1/4-mi: Industrial	Domestic: 10,000 gpd/acre[3]	166,906	38,316	
	A/C: 0.17 gpd/sf	166,906		28,374
Total Water Demand			**4,563,818**	
Total Wastewater Generation			**3,616,999**	

Notes:

1. Consumption rates obtained from the 2021 *CEQR Technical Manual* Table 13-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment," unless otherwise noted.

2. Considers a population of 20,986 residents (estimate provided by DCP).

3. Based on 2014 *East NY Rezoning FEIS.* Calculated based on total building floor area, assuming no additional water demand from open storage.

4. A 3.5 person/D.U. has been adopted for the purposes of this calculation.

5. A two occupant/D.U. has been adopted for the purposes of this calculation.

Source: CSA Group, 2023.

WASTEWATER TREATMENT

The calculations in Table 10-10, "Water Demand and Wastewater Generation (With-Action Condition)," indicate that the Proposed Actions would generate an incremental flow of 2,366,639 gpd of wastewater. From this result, it is evident that the wastewater treatment provided by the existing infrastructure (Hunts Point WRRF) has sufficient capacity to continue to provide adequate service with the expected increased demand in wastewater flow of (2,366,639 gpd).

In terms of existing sewer facilities, it is recognized that the additional wastewater generation would be distributed along local sewers extending along 46 blocks, due to the linear alignment of properties along the main corridors. With 60 projected property lots included in the Proposed Actions, the wastewater flow increments 2,366,639 gpd would produce on average 39,444 gpd per property. To determine if the existing sewer system has sufficient hydraulic capacity, developers will be required to perform a hydraulic analysis to determine the system capacity at the time of connection to each sewer main.

STORMWATER AND DRAINAGE MANAGEMENT

Table 10-11, "Runoff Coefficient Calculation," provides the runoff coefficient calculation for the Existing and With-Action conditions, using the *CEQR Technical Manual* Calculation Matrix. The runoff coefficient is a number ranging from 0.0 (for 100 percent coverage) to 1.0 (for no coverage) that is applied in the runoff volume calculations to represent the amount of rainfall that would not evaporate or infiltrate to the ground. Because the existing properties are mostly developed, as judged by the resulting No-Action runoff coefficient of 0.91, the Proposed Actions provides only a minor change in this coefficient by increasing it to 0.92.

Table 10-12, "Runoff and Wastewater Volume Calculations," provides the runoff and wastewater generation calculations based on the *CEQR Technical Manual* Calculation Matrix. These calculations demonstrate that the stormwater run-off volume contributed to the combined sewer service area impacted by the projected development sites in the With-Action condition would range from 0.029 to 1.858 MG during storm events with up to 2.5 inches of rainfall. Additionally, the calculations indicate that the combined sewer discharge to be generated by the projected development sites would range from 0.023 to 2.849 MG. Compared to the No-Action condition volumes discharged to the combined sewer systems and the sites draining to the separate sewer system, the sub-catchment areas would have an increase ranging from of 0.020 to 0.869 MG, during storm events with up to 2.5 inches of rainfall. This increment is primarily associated with dry weather flows and the increase in population density. The increased discharge would be distributed over the 60 projected development on 46 city blocks along an approximately 2.2-mile corridor and as the projected sites are developed, they would be required to prepare sewer connection permits to be approved during the construction permitting phase. Therefore, the Proposed Actions would result in no significant adverse impacts to stormwater and drainage management.

Table 10-11: Runoff Coefficient Calculation

No-Action Condition						
	Surface Type[1]	**Roof[2]**	**Pavement & Walks**	**Other[3]**	**Grass**	**Total**
HP-007	**Area, (percent)**	30	16	54	0	100
	Surface Area, SF	36,617	19,566	67,000	0	123,183
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.89
With-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-007	**Area, (percent)**	62	38	0	0	100
	Surface Area, SF[1]	76,422	46,210	552	0	123,184
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.94
No-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-013	**Area, (percent)**	75	25	0	0	100
	Surface Area, SF[1]	114,552	38,569	0	0	153,121
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.96
With-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-013	**Area, (percent)**	82	18	0	0	100
	Surface Area, SF[1]	127,831	28,314	0	0	156,145
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.97
No-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-014	**Area, (percent)**	48	42	9	0	100
	Surface Area, SF[1]	609,097	533,430	114,560	0	1,257,087
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.92
With-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-014	**Area, (percent)**	1.00	0.85	0.85	0.2	0.97
	Surface Area, SF[1]	66	33	1	0	100
	Runoff Coefficient	827,128	420,182	9,506	0	1,256,817
No-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-033	**Area, (percent)**	61	34	5	0	100
	Surface Area, SF[1]	595,226	335,704	44,403	0	975,333
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.94
With-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
HP-033	**Area, (percent)**	56	38	6	0	100
	Surface Area, SF[1]	545,072	371,014	59,248	0	975,334
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.93

Table 10-11: Runoff Coefficient Calculation (continued)

No-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
Separate Sewer	**Area, (percent)**	17	35	49	0	100
	Surface Area, SF[1]	315,602	655,512	914,978	0	1,886,092
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.88
With-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
Separate Sewer	**Area, (percent)**	20	31	49	0	100
	Surface Area, SF[1]	377,513	593,601	914,978	0	1,886,092
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.88
No-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
Total Area	**Area, (percent)**	38	36	26	0	100
	Surface Area, SF[1]	1,671,095	1,582,781	1,140,941	0	4,394,817
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.91
With-Action Condition						
	Surface Type	**Roof**	**Pavt & Walks**	**Other**	**Grass**	**Total**
Total Area	**Area, (percent)**	44	33	22	0	100
	Surface Area, SF[1]	1,953,967	1,459,321	984,284	0	4,397,572
	Runoff Coefficient	1.00	0.85	0.85	0.2	0.92

Notes:
1. Runoff coefficients for each surface type are as per NYCDEP.
2. Total roof areas onsite assumed equal to the building footprint area provided by DCP
3. Estimate of unpaved areas provided by DCP.

Source: WS1_Surfaces Calculations, Calculation Matrix spreadsheet, *2021 CEQR Technical Manual*; NYCDEP; CSA Group, 2023.

Table 10-12: Runoff and Wastewater Volume Calculations

No-Action Condition: HP-007 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	2.83	0.89	0.000	0.020	0.003
0.40	3.80			0.027	0.020	0.003
1.20	11.30			0.082	0.020	0.010
2.50	19.50			0.172	0.020	0.017
With-Action Condition: HP-007 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	2.83	0.94	0.000	0.148	0.023
0.40	3.80			0.029	0.148	0.023
1.20	11.30			0.087	0.148	0.070
2.50	19.50			0.181	0.148	0.121
No-Action Condition: HP-013 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	3.58	0.96	0.000	0.233	0.037
0.40	3.80			0.037	0.233	0.037
1.20	11.30			0.112	0.233	0.110
2.50	19.50			0.234	0.233	0.189
With-Action Condition: HP-013 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	3.58	0.97	0.000	0.427	0.068
0.40	3.80			0.038	0.427	0.068
1.20	11.30			0.113	0.427	0.201
2.50	19.50			0.236	0.427	0.347
No-Action Condition: HP-014 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	28.85	0.92	0.000	0.213	0.034
0.40	3.80			0.289	0.213	0.034
1.20	11.30			0.867	0.213	0.100
2.50	19.50			1.807	0.213	0.173
With-Action Condition: HP-014 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	28.85	0.95	0.000	1.219	0.193
0.40	3.80			0.297	1.219	0.193
1.20	11.30			0.892	1.219	0.574
2.50	19.50			1.858	1.219	0.991
No-Action Condition: HP-033 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	22.39	0.94	0.000	0.468	0.074
0.40	3.80			0.229	0.468	0.074
1.20	11.30			0.687	0.468	0.221
2.50	19.50			1.431	0.468	0.381

Table 10-12: Runoff and Wastewater Volume Calculations (continued)

With-Action Condition: HP-033 Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	22.39	0.93	0.000	1.309	0.207
0.40	3.80			0.227	1.309	0.207
1.20	11.30			0.681	1.309	0.616
2.50	19.50			1.419	1.309	1.063
No-Action Condition: Separate Sewer Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	43.3	0.88	0.000	0.316	0.050
0.40	3.80			0.412	0.316	0.050
1.20	11.30			1.235	0.316	0.149
2.50	19.50			2.572	0.316	0.257
With-Action Condition: Separate Sewer Sewershed						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	43.3	0.88	0.000	0.514	0.081
0.40	3.80			0.414	0.514	0.081
1.20	11.30			1.242	0.514	0.242
2.50	19.50			2.587	0.514	0.418
No-Action Condition: Total Area						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	100.95	0.91	0.000	1.250	0.198
0.40	3.80			0.994	1.250	0.198
1.20	11.30			2.983	1.250	0.589
2.50	19.50			6.216	1.250	1.016
With-Action Condition: Total Area						
Rainfall, in	**Duration, hr**	**Total Area (A), acre**	**Weighted Runoff Coefficient (C)**	**Stormwater to CSS, MG**	**Daily Sanitary Sewage Generation per CEQR TM, MGD**	**Sanitary to CSS, MG**
0.00	3.80	100.95	0.92	0.000	3.617	0.573
0.40	3.80			1.005	3.617	0.573
1.20	11.30			3.015	3.617	1.703
2.50	19.50			6.281	3.617	2.939

Notes:

1. RAINFALL RUNOFF COEFFICIENTS used are composite rates per calculation

2. RUNOFF VOLUMES for EXISTING and WITH-ACTION condition have been calculated as follows:

QVOL = [RVOL x A x RC x 7.48GAL/1,000,000 MGD per GAL] - SVOL ; where

QVOL = Total Volume of Rainfall for 24-hour storm event discharged offsite (either to River or into CSS), in MG

RVOL = RAINFALL VOLUME, in Inches, for the corresponding RAINFALL RETURN PERIOD listed in WS2 in the EXISTING and PLAN Tables.

A = SITE AREA, in SQ. FT., as indicated in WS1 EXISTING and WITH-ACTION Tables for the various site areas.

RC = RAINFALL RUNOFF COEFFICIENT for each of the applicable Site Areas as per EXISTING and WITH-ACTION tables (refer to WS1).

Source: WS2_Volume Calculations, Calculation Matrix spreadsheet, *2021 CEQR Technical Manual*; NYCDEP; CSA Group, 2023.

CSOs affected by the Proposed Actions will not have adverse impacts to the combined stormwater and sanitary system. However, additional runoff generated from the Proposed Actions can be minimized into the combined sewer system by using Best Management practices identified in the section *Stormwater Best Management Practices* below.

CSO hydraulic reliefs projects continue to be evaluated by NYCDEP as part of their Long-Term Control Plans (LTCP). Current efforts include improvements to relief structures in several outfalls of the Bronx River to reduce discharges to water bodies during peak events, as part of the approved 2017 LTCP. Other CSOs discharge to the Westchester Creek, the 2017 LTCP for this stream does not include improvements of any CSO, the main component of the plan, a proposed sewer parallel to Pugsley Creek, was completed in 2020 to reduce overflows into Pugsley Creek. While none of the outfalls included in the current scope of the plan are directly affected by the proposed sites, a general improvement in the entire Hunts Point Watershed is to be expected from the LTCP implementations.

Table 10-12, "Runoff and Wastewater Volume Calculations," also show that particular attention should be given to outfall HP-014, as this would be the CSS outfall most impacted by the increased runoff and wastewater flow.

Particular attention should be given to Projected Development Sites 1 and 5 once detailed-level design and permitting of the works to be done in each site take place. As stated previously, both sites are located within the Bronx River drainage area of concern and guidance from the *CEQR Technical Manual* indicates that projects generating increments of dry or wet weather flows higher than two percent over the exiting conditions will be further reviewed by NYCDEP to coordinate with the lead agency to determine whether further modeling is necessary to evaluate the magnitude of impacts to a receiving waterbody.

STORMWATER BEST MANAGEMENT PRACTICES

Pursuant to Chapter 31 of Title 15 of the Rules of the City of New York (RCNY), as amended in 2012, for a new development, the stormwater release rate limit is 0.10 cubic feet per second (cfs) per acre or 0.046 cfs (whichever is greater) for combined sewer systems and one cfs per acre or 0.046 cfs (whichever is greater) for storm sewer systems. For alterations, the stormwater release rate for the altered areas will be directly proportional to the ratio of the altered area to the total site area, and no new points of discharge are permitted. Therefore, any new developments or alterations in the With-Action condition requiring a connection to the sewer system would be required to achieve the new flow restrictions. In order to meet these restrictions, it is likely that on-site detention of stormwater would be incorporated on all of the 60 projected development sites.

As part of the 2022 Unified Stormwater Rule amendments NYCDEP made public the New York City Stormwater Manual as part of the new Chapter 19.1 features. The objective of the manual is to provide guidance about the proper design and construction in the early stages of site planning and building design. This guidelines document includes performance standards to allow for a wide range of management techniques, costs, and space considerations with regards to Best Management Practices (BMPs) and Storm Management Practices (SMPs). With the 2012 RCNY amendment, self-certification of house or site connection proposals is not permitted in connection with any proposed new development or expansions

of existing developments as per Title 15, Chapter 31, "Rule Governing House/Site Connections to the Sewer System."

NYCDEP is currently working with other City agencies on City Hall's Rezoning coordination efforts, and it is expected that an Amended Drainage Plan (ADP) will be prepared for the Affected Area. In order to be issued a permit to connect to the City sewer within the Affected Area, an applicant proposing a new development or expansion of an existing development may be required to submit a site-specific hydraulic analysis. Sewer improvements and/or incorporation of BMPs may also be required of the applicant at the time of the house or site connection proposal.

Application of the regulations of Chapter 19.1 of Title 15 of the Rules of the City of New York is needed when a minimum of 20,000 sf of soil are disturbed or when the increase of impervious area reaches 5,000 sf. As a result, the need for BMPs and SMPs, and the selection of them will need to be assessed for each projected development site. A broad range of BMPs could be implemented on the development lots within the Affected Area to facilitate stormwater source controls and limit the stormwater release rate to the allowed values. The increased flow to the combined sewer system would be a direct result of the increased densities and sanitary flows associated with the Proposed Actions. The implementation of low-flow fixtures, as per the New York City Plumbing Code, Local Law 33 of 2007, and the USEPA's Water Sense Program, would help to control sanitary flows.

The Proposed Actions would increase flows to the City's combined sewer system that may be discharged as CSOs into the Westchester Creek during rain events, because of increases in wastewater flows. Because of the available treatment capacity of the Hunts Point WRRF, the projected increased flows to the combined sewer system will not produce an overwhelming demand on the WRRF and no significant adverse impact is expected. Based on this analysis and the required BMP measures that would be implemented on each projected development site by their respective developer in accordance with City site connection requirement, and therefore, the Proposed Actions would not result in an adverse impact to the conveyance infrastructure.