11 WATER AND SEWER INFRASTRUCTURE

11.1 Introduction

Per the 2021 *CEQR Technical Manual*, New York City's water and sewer network is fundamental to the operation, health, safety, and quality of life of the City and its surrounding environment, and it must be sized to fit the users and surface conditions to function adequately. Ensuring these systems have adequate capacity to accommodate land use or density changes and new development is critical to avoid environmental and health problems, such as sewer back-ups, street flooding, or pressure reductions.

The purpose of a water and sewer infrastructure analysis is to assess whether a proposed project may adversely affect the City's water distribution or sewer system and, if so, assess the effects of such a project to determine whether its impact will be significant. The potential development site is not included in this analysis as it isn't clear whether that development would result in exceptionally large demand for water (more than one million gallons per day). As described in Chapter 1, "Project Description" the With-Action Condition would facilitate the development of three buildings totaling 866,017 gross square feet (gsf) of floor area across the Applicants' waterfront sites. Over the No-Action Condition, the With-Action Condition would facilitate a net increase of approximately 808,762 square feet (sf) of residential use (970 dwelling units (DU)) and 21,229 gsf of commercial use on the projected development sites.

This chapter assesses the potential effects of the Proposed Actions on the City's water supply, wastewater treatment, and stormwater management in accordance with the guidelines of the *CEQR Technical Manual*.

11.2 Principal Conclusions

Water Supply

The Proposed Actions would not result in a significant adverse water supply impact. The *CEQR Technical Manual* indicates that a preliminary water supply analysis is warranted if the project is in an area that experiences low water pressure and the Proposed Actions would generate demand for more than one million gallons per day (mgd) of water. The Proposed Rezoning Area is located outside an area of low water pressure and is served by an existing water main in Sheridan Boulevard. The With-Action Condition would demand 422,458 gallons per day (gpd) of water, which would be 399,581 gpd more than the No-Action Condition of 22,877 gpd. Project-generated development would connect to the existing water main in Sheridan Boulevard. Because the Proposed Actions would demand less than one million gpd of water supply, a preliminary water supply analysis is not warranted for the Proposed Actions.

Wastewater Conveyance and Treatment

The Proposed Actions would not result in a significant adverse wastewater conveyance and treatment impact.

A sewer certification is required for any new connection to a City sewer, a private sewer, a private drain, a septic system, or an approved outlet. Project-generated development would require a connection to the City's sewer. Before a connection can be made to the City's sewer system, the New York City Department of Environmental Protection (DEP) may require a hydraulic analysis be completed to assess sewer capacity before new connections can be made to the City's sewer. DEP is required to certify that the sewer can accept the storm or sanitary discharge through the site connection approval process. DEP's site connection process would preclude the potential for significant adverse impacts to New York City stormwater infrastructure or treatment facilities.

The Proposed Rezoning Area is within a combined sewer area. During heavy rainstorms, combined sewer systems receive higher than normal flows and occasionally exceed the capacity of the Hunts Point Water Resource Recovery Facility (WRRF) and the excess mixture of stormwater and untreated sewage discharges directly into the City's waterway. These occurrences are called combined sewer overflow (CSO) events. In the With-Action Condition, project-generated development would comply with Chapters 19.1 and 31 of Title 15 of the Rules of the City of New York (the "Unified Stormwater Rule"), which sets the maximum allowable discharge rate to the City sewer system. With the Unified Stormwater Rule in place, the Proposed Actions may reduce the intensity and frequency of CSO events. Accordingly, the Proposed Actions would not result in significant adverse impacts on the City's wastewater infrastructure facilities and would not increase the intensity and frequency of CSO events.

Wastewater generated at the development sites would be treated by the Hunts Point WRRF, which is operated by DEP. Per CEQR methodologies, the Proposed Actions are projected to generate up to 278,635 (gpd of wastewater, which is a net increase of approximately 265,491 gpd over the No-Action Condition. This 265,491 gpd of incremental wastewater represents an increase of 0.27 mgd of wastewater that would be directed to the Hunts Point WRRF. The Hunts Point WRRF has an excess capacity of approximately 68.7 mgd and would be able to accommodate the incremental flows without exceeding design capacity. Accordingly, the Proposed Actions would not result in

a significant adverse wastewater conveyance and treatment impact, and no further analysis is warranted.

Stormwater Management

The Proposed Actions would not result in a significant adverse stormwater management impact. The projected development sites are fully developed with impervious surfaces such as roofs and pavement. In the With-Action Condition, new impervious surfaces would be introduced, and impervious cover would decrease compared to the No-Action Condition. In the With-Action Condition, approximately 23 percent of the projected development sites would be developed with grass and softscape as required by waterfront zoning. In the With-Action Condition, the projected development sites' runoff coefficient would decrease 14 percentage points from 0.91 to 0.77. This reduction in the runoff coefficient indicates the projected development sites would generate less stormwater runoff than the No-Action Condition. Like the No-Action Condition, stormwater from the development sites would continue to be discharged to the Bronx River; however, with the Proposed Actions, stormwater outfalls would be developed or reconstructed in accordance with current NYS Department of Environmental Conservation (DEC) standards. Accordingly, the Proposed Actions would not result in a significant adverse stormwater management impact, and no further analysis is warranted.

11.3 Methodology

This water and sewer infrastructure analysis follows the guidelines set forth in the *CEQR Technical Manual* for water supply, wastewater conveyance and treatment, and stormwater management.

Water Supply

New York City obtains its water from three surface water supply systems that form a network of reservoirs, aqueducts, and tunnels that extend nearly 125 miles north of New York City. A grid of underground distribution mains as large as 96 inches in diameter feed smaller mains as small as 8 inches to individual locations. In order to determine if a project could alter the effectiveness or pressure of New York City's water supply, an assessment of water supply infrastructure is necessary if the proposed project would result in:

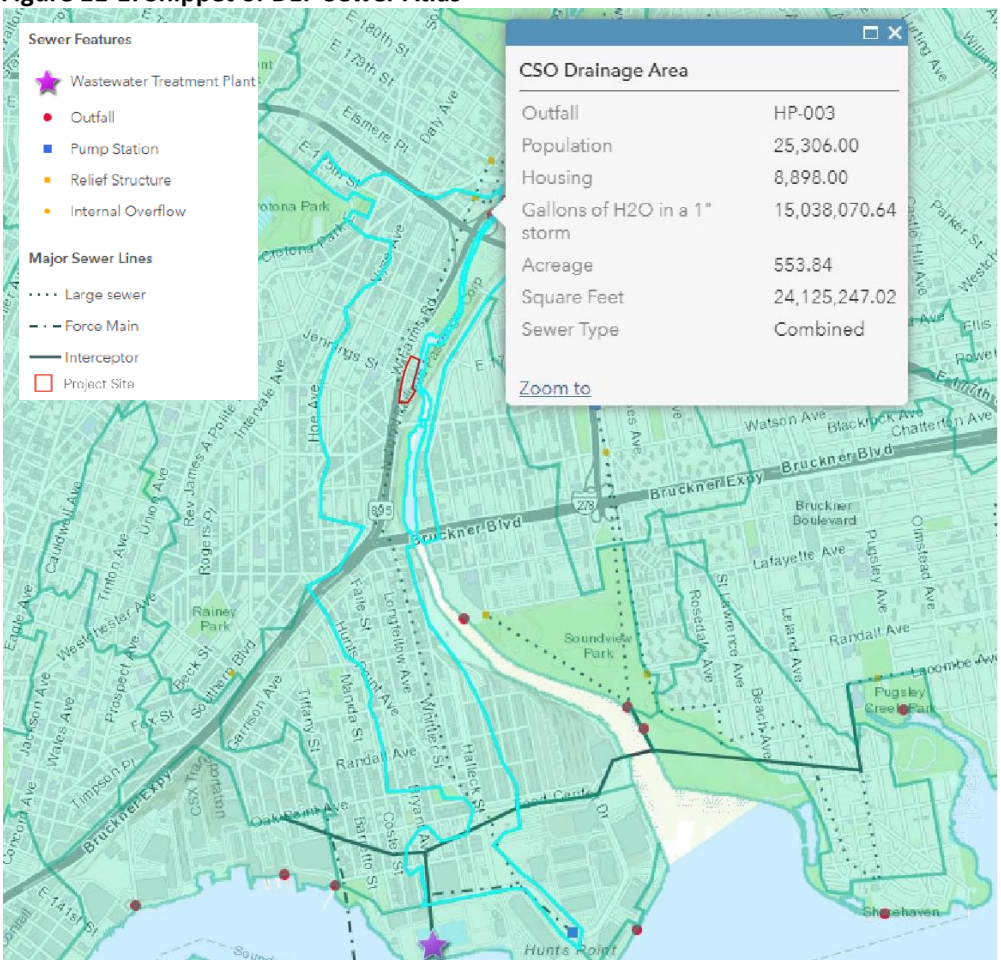
- An exceptionally large demand for water, such as a project that uses one million gallons of water per day; or
- Is located in an area that experiences low water pressure such as the Rockaway Peninsula or Coney Island.

The Project Area is not located within an area that experiences low water pressure. The With-Action Condition would demand 422,458 gpd of water, which would be 399,581 gpd more than the No-Action Condition of 22,877 gpd. Both the incremental and With-Action water demand would be less than the CEQR screening threshold of one million incremental gallons mgd. The Proposed Actions do not have the potential to result in a significant adverse water supply impact, and preliminary water supply assessment is not warranted.

Wastewater Conveyance and Treatment

New York City's wastewater conveyance and treatment infrastructure were originally designed based on the designated zoning of the area and the population it would likely generate. Additional population density can have a significant effect on the performance of wastewater conveyance and treatment facilities. Figure 11-1 shows the Proposed Rezoning Area is in a CSO drainage area.

Figure 11-1: Snippet of DEP Sewer Atlas



Source: DEP Sewer Atlas

During heavy rainstorms, combined sewer systems receive higher than normal flows and occasionally exceed the capacity of the Hunts Point WRRF. The excess mixture of stormwater and untreated sewage discharges directly into the City's waterway. These occurrences are called CSO events.

The thresholds that warrant a preliminary wastewater conveyance and treatment analysis for projects located within CSO areas in the Bronx are:

- The addition of 400 residential units or 150,000 sf of commercial, public facility, institutional or community facility uses in a combined sewer area;
- Projects that involve the development of a site of 5 acres or more and would increase the amount of impervious surface on the site;

- Projects that involve the development on a site of 1 acre or more and would increase the amount of impervious surface within:
  - The Jamaica Bay watershed; or
  - Specific drainage areas including: Bronx River, Coney Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newton Creek, and Westchester Creek.
- Projects that would involve construction of a new stormwater outfall that requires federal or state permits.

The Proposed Actions would not entail development on a site of 5 acres or greater. The Proposed Actions would make possible development on sites over 1 acre within the Bronx River drainage area; however, the development sites are developed with impervious coverage, and the project-generated development would not increase the amount of impervious area.

The Proposed Rezoning Area is located within the Bronx, and the project-generated development would result in up to 970 dwelling units DUs over the No-Action Condition in a combined sewered area. The project-generated development would also construct new stormwater outfalls that require a joint application permit from the NYSDEC and the United State Army Corps of Engineers. Therefore, a preliminary wastewater conveyance and treatment analysis is warranted.

Stormwater Management

Surface coverage characteristics and the addition of impervious surfaces can strain to stormwater management systems. If projects have the potential to overburden stormwater systems or create the potential for additional CSO volume or events, coordination with the New York City Department of Environmental Protection (DEP) to submit an amended drainage plan (ADP) may be required. The thresholds that warrant a preliminary analysis of stormwater management systems are identical to the CEQR thresholds for an assessment of wastewater conveyance and treatment.

The Proposed Actions would not require construction of a new stormwater outfall that requires permitting and would not develop on a site of 5 acres or greater. The Proposed Actions would develop on over 1 acre of land proximate to the Bronx River; however, the site is currently a developed urban area with impervious coverage and would not alter the amount of impervious surface near the Bronx River special drainage area.

The Proposed Rezoning Area, located within the Bronx, would result in up to 970 dwelling units (DUs) over the No-Action Condition in a combined sewered area. Therefore, based on the threshold of 400 additional units developed within the Bronx per the CEQR Technical Manual, a preliminary stormwater management analysis is warranted.

Data Sources

This water and sewer analysis uses data from the Sewer Atlas maintained DEP, DEP monthly flow data, and information provided in the *CEQR Technical Manual*.

11.4 Existing Conditions

Wastewater Conveyance and Treatment

Sewers collect sewage from buildings and stormwater runoff from streets and sites with connections to the sewer system. The diameter of collection sewers typically range between ten inches to two feet on side streets, and can be larger under other roadways. Trunk sewers bring the sewage to interceptor sewers, which convey the wastewater to the WRRFs for treatment. When new development requires a connection to a City sewer, DEP must certify that the sewer can accept the storm or sanitary discharge through the site connection approval process. A sewer certification is required for any new connection to a City sewer, a private sewer, a private drain, a septic system, or an approved outlet.

While the majority of New York City is managed by combined sewers and treated by WRRFs, portions of Brooklyn, Queens, and Staten Island are managed by separate storm sewers or are in unsewered areas. The Proposed Rezoning Area is in a combined sewer area where stormwater and sanitary sewers are transported for treatment to the Hunts Point WRRF. The plant has operated since 1952 and has a design capacity to treat 200 mgd of wastewater.[1] In 2022, Hunts Point WRRF received an average flow of 131.33 mgd, as shown in Table 11-1. Based on these average flows, the WRRF has an excess capacity of 68.7 mgd, which is approximately 34 percent of its total capacity.

Table 11-1: 2021-2022 Monthly Average Dry Weather Flows to Hunts Point WRRF

Year	Month	Flows at Hunts Point WRRF (mgd)[1]
2021	June	121
	July	128
	August	122
	September	134
	October	118
	November	114
	December	110
2022	January	120
	February	127
	March	123
	April	121
	May	120
	June	118
	Average	**131.33**

[1] mgd = million gallons per day.
Source: NYC Department of Environmental Protection.

Per DEP NYC Open Sewer Atlas, the Proposed Rezoning Area is in Subcatchment Area HP-003. In this area, the existing sewer flows south along Edgewater Road (the Sheridan Boulevard service road) from East 172nd Street to Westchester Avenue along the Proposed Rezoning Area. The extent and size of the existing sewers would be confirmed during DEP's site connection approval process.

[1] New York City's Wastewater Treatment System Report.

Stormwater Management

The volume of stormwater runoff at a site varies depending on the type of land cover, which can be either pervious or impervious. The DEP defines runoff coefficients to correlate with the pervious or impervious qualities of the land cover. Per the *CEQR Technical Manual*, grass and softscape have a runoff coefficient of 0.20 because of their ability to absorb some rainfall, whereas roof area and pavement have higher runoff coefficients of 1.00 and 0.85 respectively, due to the inability of these materials to absorb or sequester rainfall.

The projected development sites comprise paved open spaces and commercial buildings. The sites slope from their high points along Edgewater Road in the west to lowest elevations along the Bronx River in the east. Projected Development Site 1 (Lot 74) comprises a one-story building and a paved accessory parking lot. Projected Development Site 2 comprises four commercial buildings, a garage, and an open parking lot. Both projected development sites currently discharge stormwater directly into the Bronx River, which is an open waterbody that is under the jurisdiction of NYSDEC and USACE.

Table 11-2 shows the weighted runoff coefficient at Projected Development Site 1 is 0.90 and 0.92 at Projected Development Site 2.

Table 11-2: Existing Project Surface Areas and Runoff Coefficients – Projected Development Sites

Site Area	Surface Type	Pavement & Walks	Roof	Total
Projected Development Site 1	Surface Area (sf)	28,381	13,027	41,408
	Area (%)	69	31	100
	Runoff Coefficient[1]	0.85	1.00	0.90
Projected Development Site 2	Surface Area (sf)	53,710	44,228	97,938
	Area (%)	55	45	100
	Runoff Coefficient[1]	0.85	1.00	0.92
Total Area of Projected Development Site 1 & Site 2 (sf)				**139,346**
Weighted Runoff Coefficient of Projected Development Site 1 & Site 2				**0.91**

[1] Runoff coefficients for each surface type per NYC Department of Environmental Protection and *CEQR Technical Manual*.
Source: NYC Department of City Planning Footprint and MapPLUTO data; aerial photographs.

Standard DEP runoff coefficients were used to determine the stormwater runoff generated during a variety of rainfall events over specified periods ranging from 3.8 to 19.5 hours. During storm events of up to 2.5 inches of rainfall, the development sites may discharge up to 0.04 millions of gallons (mg) of stormwater and 0.00 mgd of sanitary flow into Hunts Point WRRF Subcatchment Area HP-003 per CEQR methodologies. Table 11-3 shows the existing stormwater and sanitary discharges during representative storm events.

Table 11-3: Existing Combined Runoff and Wastewater Generation for Projected Development Sites

Rainfall (in)	Duration (hrs)	Total Area (acres)	Weighted Runoff Coefficient[1]	Stormwater to CSS[2]	Sanitary to CSS	Total Volume to CSS (mg)
0.00	3.80	3.20	0.91	0.00	0.00	0.00
0.40	3.80			0.03	0.01	0.04
1.20	11.30			0.10	0.01	0.11
2.50	19.50			0.20	0.02	0.22

[1] Refer to Table 11-3.
[2] Combined sewer system (CSS).
Source: NYC Department of Environmental Protection runoff coefficients.

11.5 No-Action Condition

In the No-Action Condition, existing conditions in the Project Area would remain. A one-story, approximately 14,000-gsf automobile mechanic training facility would remain on Projected Development Site 1, and the four commercial buildings, garage, and open parking lot would remain on Projected Development Site 2. The development sites would continue to predominately comprise impervious surfaces with a high runoff coefficient. Stormwater from the development sites would continue to be discharged directly to the Bronx River, and wastewater generated in the Proposed Rezoning Area would continue to be discharged to Subcatchment Area HP-003.

11.6 With-Action Condition

In the With-Action Condition, Projected Development Site 1 would be developed with a mixed-use building totaling in 304 DUs and up to 5,000 gsf of retail space. Projected Development Site 2 would be developed with two mixed-use buildings totaling 666 DUs, up to 16,229 gsf of retail, and up to 100 accessory parking spaces. Table 11-4 shows the With-Action Condition water consumption demand would be 422,458 gpd and the wastewater generation would be 278,635 gpd.

Table 11-4: With-Action Water Consumption and Waste Generation – Projected Development Sites 1 & 2

Land Use	Water Consumption and Wastewater Generation Rates	Area/ Dwelling Units	Domestic Water/ Wastewater Generation (gpd)[1]	Air Conditioning (gpd)
Residential	282 gpd/ DU[2]	970 DU	273,540	140,214
	A/C 0.17 gpd/sf	824,788 sf		
Retail[3]	Domestic 0.24 gpd/sf	21,229 sf	5,095	3,609
	A/C 0.17 gpd/sf			
		Subtotal	**278,635**	**143,823**
		Total Water Demand (gpd)	**422,458**	
		Total Wastewater Generation (gpd)	**278,635**	

[1] Gallons per day (gpd).
[2] Assumes 2.82 residents per DU, mean household size reported in Community District 9 in the Population FactFinder published by the NYC Department of City Planning times 100 gpd per resident.
Source: *CEQR Technical Manual*, Table 13-2.

Wastewater Conveyance and Treatment

Wastewater generated in the With-Action Condition would continue to be treated by the Hunts Point WRRF, which – like the existing and No-Action conditions – would continue to have an operating capacity of approximately 200 mgd.

Table 11-5 shows the incremental wastewater generation in the Proposed Rezoning Area. Under the Reasonable Worst Case Development Scenario (RWCDS) established for this project, the With-Action Condition would generate 278,635 gpd of wastewater, which is an increase of 265,491 gpd of wastewater over the No-Action Condition.

Table 11-5: No-Action and With-Action Wastewater Generation

Condition	Wastewater Generated (gpd)[1]
No-Action Condition	13,144
With-Action Condition	278,635
Increment	**265,491**

[1] Gallons per day (gpd).
Source: *CEQR Technical Manual*, Table 13-2.

The Hunts Point WRRF has an operational capacity of approximately 200 mgd and operates with an average dry weather flow of approximately 131.33 mgd (66 percent of capacity), maintaining an average excess capacity of approximately 68.7 mgd (34 percent of capacity). The incremental 265,491 gpd (0.27 mgd) of wastewater generated by the development in the With-Action Condition would represent less than one percent of Hunts Point WRRF's total capacity. With the approximately 0.27 mgd of incremental wastewater flows, the Hunts Point WRRF would process approximately 132.47 mgd of wastewater in the With-Action Condition, and would have an average excess capacity of approximately 67.53 mgd. Because project-generated wastewater would not cause the Hunts Point WRRF to operate over capacity, the Proposed Actions would not result in significant adverse water and sewer impacts in the area of wastewater treatment.

Stormwater Management

In the With-Action Condition, impervious cover on the projected development sites would be decreased compared to the No-Action Condition. In the With-Action Condition, approximately 23 percent of the projected development sites would be developed with grass and softscape, as required by waterfront zoning. Table 11-6 shows that the weighted runoff coefficient for the projected development sites would be 0.77.

Table 11-6: With-Action Project Surface Areas and Runoff Coefficients

Site Area	Surface Type	Grass & Softscape	Roof	Pavement & Walks	Total
Projected Development Site 1	Surface Area (sf)	9,726	21,563	10,119	41,408
	Area (%)	23	52	24	100
	Runoff Coefficient[1]	0.20	1.00	0.85	0.78
Projected Development Site 2	Surface Area (sf)	22,848	45,195	29,895	97,938
	Area (%)	23	46	31	100
	Runoff Coefficient[1]	0.20	1.00	0.85	0.77
				Total Area of Projected Development Sites (sf)	**139,346**
				Weighted Runoff Coefficient of Projected Development Sites	**0.77**

[1] Runoff coefficients for each surface type per NYC Department of Environmental Protection (DEP)
Source: NYC Department of City Planning (DCP) Footprint and PLUTO data; aerial photographs.

Compared to the No-Action Condition, the With-Action Condition would introduce new softscape areas, and the runoff coefficient from the projected development sites would decrease 14 percentage points from 0.91 to 0.77. This reduction in the runoff coefficient indicates the projected development sites would generate less stormwater runoff than the No-Action Condition.

Table 11-7 shows the estimated stormwater runoff and the sanitary flows to the combined sewer system (CSS) within the CSO drainage area HP-003. Depending on

intensity and continuity during storm events with up to 2.5 inches of rainfall, direct stormwater discharge volumes to the CSS would range between 0.00 and 0.17 mgd. Sanitary flow from the projected development sites would contribute between 0.07 to 0.34 mgd to the Hunts Point WRRF. Stormwater flows in the With-Action Condition would represent an increase of 0.12 mgd over the No-Action Condition per CEQR methodologies.

Table 11-7: With-Action Development Sites' Combined Stormwater Runoff and Wastewater Generation

Rainfall (in)	Duration (hrs)	Total Area (acres)	Weighted Runoff Coefficient[1]	Stormwater to CSS[2]	Sanitary to CSS	Total Volume to CSS (mgd)
0.00	3.80	3.2	0.77	0.00	0.07	0.07
0.40	3.80			0.03	0.07	0.09
1.20	11.30			0.08	0.20	0.28
2.50	19.50			0.17	0.34	0.51

[1] Refer to Table 11-6.
[2] Combined sewer system (CSS).
[3] Numbers are rounded to the hundredth decimal place.
Source: NYC Department of Environmental Protection runoff coefficients and *CEQR Technical Manual*.

In New York City, new development must comply with the Unified Stormwater Rule (per Chapters 19.1 and 31 of Title 15 of the RCNY). These regulations require that stormwater be released from redeveloped sites at a rate lower than that calculated per CEQR methodologies. As noted in Chapter 31 of Title 15 of RCNY, the permissible stormwater release rate is the greater of 0.046 cubic feet per second (cfs), or 0.1 cfs per acre. These maximum release rates were selected to reduce the effects of new development on the City's sewer system and to reduce the likelihood and severity of CSO events. With the Unified Stormwater Rule setting the maximum release rates, the Proposed Actions would have a nominal effect on the City sewer system and may reduce the frequency and severity of future CSO events over the No-Action Condition.

New development in the Proposed Rezoning Area would require a connection to the City's combined sewer system. The restricted flow rate required by Chapter 31 of Title 15 of RCNY can be achieved through subsurface, roof, or tank detention systems. Stormwater can also be routed to discharge directly to the Bronx River at existing or new outfalls, further reducing the demand on the City's sewer system. New stormwater outfalls would require a discretionary permit from NYSDEC, and would be required to comply with the current NYSDEC standards pertaining to stormwater discharges directly to the Bronx River. The NYSDEC permitting process would provide protections to ensure that project-generated stormwater that discharges directly to the river would not have the potential to result in significant adverse effects.

Stormwater analysis would be required as part of the DEP's site connection approval process. For new developments in rezoned areas, DEP requires a hydraulic capacity analysis of the existing local sewers. The purpose of this hydraulic capacity analysis is to determine whether the local sewers have capacity to accommodate new development, or whether capacity improvements are needed. Before project-generated development can connect to the City's sewer system, DEP must certify that the system would have capacity to accommodate the additional development, and to inform their decision, they may require that a hydraulic analysis be completed for the proposed development. With adherence to these regulations in place, the Proposed Actions would not result in significant adverse water and sewer impacts in the area of stormwater management.