Chapter 10 : Water and Sewer Infrastructure

I. INTRODUCTION

This chapter assesses the potential impacts of the Proposed Project on the City's water supply, wastewater treatment, and stormwater management infrastructure. This analysis is made in accordance with the guidance set forth in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*.

As described in Chapter 1, "Project Description," the Applicant is seeking discretionary approvals ("Proposed Actions"), including zoning map and text amendments, a large-scale general development (LSGD) special permit, a City Map Amendment to re-establish a portion of Beach 52nd Street south of Rockaway Beach Boulevard to reconnect with Rockaway Freeway, and public funding and/or financing from various City and New York State agencies and/or programs related to affordable housing development on the Project Site. The Project Site is located in Queens Community District 14 (CD 14). The Proposed Actions would facilitate the Proposed Project, consisting of an approximately 2,378,480 gross square feet (gsf) development comprised of 11 buildings with approximately 2,200 income-restricted dwelling units (DUs), of which 1,910 DUs are intended to be affordable for households with incomes up to 80% of the Area Median Income (AMI), of which 270 units would be set aside for senior housing DUs, and 290 DUs are intended to be income-restricted for moderate income households. In addition to the residential use, the Proposed Project would include approximately 74,269 gsf of retail space, approximately 83,744 gsf of community facility space, approximately 51,601 square feet (sf) of publicly-accessible open space, and approximately 910 accessory parking spaces.

The Proposed Project would connect to both the municipal water supply and separated wastewater and stormwater conveyance and treatment systems (sanitary sewage flows to a wastewater treatment plant and stormwater flows untreated through outfalls into nearby waterways). Wastewater from the area is conveyed to the Rockaway Wastewater Treatment Plant (WWTP), which has a total capacity of approximately 45 million gallons per day (mgd).

Section 200 of Chapter 13 Water and Sewer Infrastructure of the *CEQR Technical Manual* identifies the types of projects that require at least a preliminary assessment of their impact on the City water supply and wastewater and stormwater conveyance and treatment systems. Guidance provided in that section of the *CEQR Technical Manual*, indicates that an assessment of the effect of the Proposed Project on the City's water supply, and wastewater and stormwater conveyance and treatment system is warranted.

II. PRINCIPAL CONCLUSIONS

Based on a preliminary assessment, it was determined that the Proposed Project would not result in any significant adverse impacts on the City's water supply or wastewater and stormwater conveyance and treatment infrastructure.

Water Supply

The Proposed Project would not result in significant adverse impacts on the City's water supply system. The additional water usage due to the Proposed Project would total less than 500,000 gallons per day (gpd), compared to the No-Action condition. This incremental demand would represent less than 1% of the City's overall water supply and would not trigger the need for a preliminary or detailed assessment as demand would not be large enough to have a significant adverse impact on the City's water supply system. In addition, according to the New York City (NYC) Department of Environmental Protection (DEP), the

existing water mains on Beach Chanel Drive and/or Rockaway Beach Boulevard would have sufficient capacity to handle the estimated increase in water demand from the Proposed Project.

Wastewater Treatment

The Proposed Project is located within a separated sewered area and would generate less than 500,000 gpd of sanitary sewage. This incremental increase in sanitary flow would not adversely affect the sewage system or the treatment capacity at the Rockaway WWTP as it is less than 0.1% of its current dry weather capacity of 19 mgd and, as such, the Rockaway WWTP would continue to have sufficient reserve capacity.

Consultation with DEP determined that the Proposed Project could result in a substantial increase in sanitary flow to the adjacent sewers. Consequently, a hydraulic analysis of the existing sewer system may be needed at the time of submittal of the site connection proposal application to determine whether the existing sewer system can support the proposed higher density development and related increase in wastewater flow, or whether there will be a need to upgrade the existing sewer system. DEP is currently in process of designing a new drainage plan for this area, which would account for the proposed zoning under the Proposed Actions.

Because of the available assimilative capacity of the Rockaway WWTP and based on consultation with DEP regarding upgrades to the existing drainage system, the projected increased flows to the City's separated sewer system would not have a significant adverse impact on water quality. Therefore, the Proposed Project would not result in significant adverse impacts to local wastewater conveyance and treatment infrastructure.

Stormwater Drainage and Management

The Proposed Project would not result in significant adverse impacts to stormwater management infrastructure. The Proposed Project would replace the vacant lot with an approximately 2.4 million gsf mixed-use development consisting of approximately 36% roof surfaces, 61% pavement surfaces, and 3% permeable surfaces such as grass and landscaping. Anticipated stormwater discharge from the Proposed Project would range between 0.09 MG to 0.57 MG depending on the rainfall volume and duration.

As part of an infrastructure capital improvement project, DEP plans to install new stormwater sewers along Rockaway Beach Boulevard. The project is anticipated to be completed in summer 2021. This sewer improvement project would provide additional capacity to convey the incremental increase of stormwater drainage emanating from the Proposed Project. The Proposed Project would also incorporate selected best management practices (BMPs) that would be required as a part of the site connection approval from DEP, the peak stormwater runoff rates would be reduced by the release of stormwater with a slowed discharge rate. Therefore, with the incorporation of appropriate BMPs that would be required as part of the site connection approval process and the planned sewer infrastructure improvement project, the overall volume of stormwater runoff and the peak stormwater runoff rate would be reduced, and there would be no significant adverse impacts on stormwater conveyance infrastructure.

III. METHODOLOGY

Water Supply

According to the *CEQR Technical Manual*, a preliminary water supply infrastructure analysis is needed if a project would result in an exceptionally large demand for water (e.g., more than one mgd) or is in an area that experiences low water pressure (e.g., areas at the end of the water supply distribution system). The incremental additional water demand from the Proposed Project would represent less than 1% of the City's overall water supply and, consequently, would not have a significant adverse impact or require a water supply assessment.

Wastewater and Stormwater Conveyance and Treatment

As indicated in Section 220 of Chapter 13 of the *CEQR Technical Manual*, a preliminary assessment of the impact of the Proposed Project on wastewater and stormwater conveyance and treatment is needed if the Proposed Project:

- Is in a combined sewer area and would exceed the following incremental development of DUs or commercial, public facility, and institution and/or community facility space above the predicted No-Action condition:
    - 1,000 DUs or 250,000 sf of commercial, public facility, and institution and/or community facility space in Manhattan; or,
    - 400 DUs or 150,000 sf of commercial, public facility, and institution and/or community facility space or more in the Bronx, Brooklyn, Staten Island, or Queens.
- Is in a separately sewered area and would exceed certain incremental development (above the predicted No-Action condition) of DUs or commercial, public facility, and institution and/or community facility space per site.
- Is in an area that is partially sewered or currently unsewered.
- Involves development on a site five acres or larger where the amount of impervious surface would increase.
- Would involve development on a site one acre or larger where the amount of impervious surface would increase and one of the following would apply: Located within the Jamaica Bay watershed; or located in certain specific drainage areas including the Bronx River, Coney Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newtown Creek, and Westchester Creek.
- Would involve construction of a new stormwater outfall that requires federal and/or state permits.

Since the Proposed Project is in a separate sewer area and would result in approximately 415,700 gsf of commercial and community facility development, exceeding the 150,000-sf threshold for Queens, a preliminary assessment of wastewater and stormwater conveyance and treatment impacts of the Proposed Project was conducted. However, since the Proposed Actions would not allow for new industrial/manufacturing uses, an assessment of potential effects of proposed industrial facilities is not necessary.

To assess the Proposed Project's potential impacts on water and sewer infrastructure, this chapter:

- Describes the existing water and sewer infrastructure serving the Project Site and estimates water demand and wastewater generation on the Project Site under existing and No-Action conditions. Existing and future water demand and sewage generation are calculated based on use generation

rates provided in the *CEQR Technical Manual*. Sanitary flows are calculated using DEP's Volume Calculation Matrix;

- Describes planned No-Action infrastructure improvements in the surrounding area, project components, and current schedules;
- Forecasts water demand and sewage and stormwater generation by the Proposed Project based on the *CEQR Technical Manual* guidelines; and
- Assesses the effects of the With-Action water demand and sewage and stormwater generation on the City's water and sewer infrastructure.

IV. EXISTING CONDITIONS

The Project Site is in the Edgemere neighborhood of Queens and is comprised of three tax lots: Lot 1 of Block 15842, Lot 1 of Block 15843, and Lot 1 of Block 15857, which have a total lot area of 409,928 sf (approximately 9.41 acres). The northern portion of the Project Site is comprised of two contiguous tax lots (Lot 1 of Block 15842 and Lot 1 of Block 15843), which forms an "L"-shape bound by Beach 50th Street to the east, Rockaway Beach Boulevard to the south, Beach 53rd Street to the west, and Beach Channel Drive to the north. The southern, much smaller, portion of the Project Site occupies Lot 1 of Block 15857 and is bound by Rockaway Beach Boulevard to the north, Lot 7 of Block 15857 to the east, Beach 52nd Street to the west, and Rockaway Freeway to the south. Both the northern and southern portion of the Project Site is currently vacant.

The northern portion of the Project Site was previously occupied by the 173-bed Peninsula Hospital Center, which has been demolished. However, the Project Site continues to be served by water, sewer, and utility infrastructure that previously served the hospital center.

Water Supply

The NYC water supply system is comprised of three watersheds – the Croton, Delaware, and Catskill – which extend as far north as the Catskill Mountains, and deliver on average approximately 1.1 billion gallons of water per day to customers in the five boroughs and Westchester County. From these watersheds, potable water is conveyed to the City via a system of reservoirs, aqueducts, and tunnels. Within the City, a grid of water pipes distributes water to customers. The Project Site is serviced by existing DEP watermains located along Beach Channel Drive, Beach 53rd Street, Rockaway Beach Boulevard, and Beach 50th Street. Since the Project Site is currently vacant, there is no current water supply demand.

Wastewater Treatment

The Project Site is located in a part of NYC served by a separate sewer area where sanitary sewage flows to a wastewater treatment plant and stormwater flows untreated through outfalls into nearby waterways. Sanitary wastewater from the Project Site is anticipated to be treated at the Rockaway WWTP, where wastewater is fully treated by physical and biological processes before it is discharged as effluent into Jamaica Bay. The quality of effluent is regulated by a State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation (NYSDEC), which establishes limits for effluent parameters (i.e. suspended solids, fecal coliform bacteria, and other pollutants). Since the volume of flow to a WWTP affects the level of treatment a plant can provide, the SPDES permit also establishes a maximum permitted capacity. For the Rockaway WWTP, the maximum permitted capacity is 45 mgd. The average dry monthly flow to the Rockaway WWTP over the past 12 has been 19 mgd, which is approximately 42% of the permitted capacity. Since the Project Site is currently vacant, there is no wastewater generation.

Table 10-1: Monthly Average Dry Weather Flows from the Rockaway WWTP

Month	Monthly Avg (MGD)
Nov-2016	15
Dec-2016	17
Jan-2017	17
Feb-2017	16
Mar-2017	16
Apr-2017	20
May-2017	22
Jun-2017	22
Jul-2017	22
Aug-2017	20
Sep-2017	21
Oct-2017	19

Data received from DEP on 2/7/2018

Stormwater Drainage and Management

Currently, stormwater runoff from impermeable surfaces on the Project Site is discharged through existing catch basins located along the perimeter of the Project Site and flows northward to connect directly with a 78" x 36" DEP storm sewer located along Beach Channel Drive. Stormwater runoff from the Project Site then flows eastward along Beach Channel Drive before travelling north along Beach 49th Street and discharged through outfalls into the Conch Basin. **Table 10-2: Surface Types on the Project Site, Existing Conditions** below summarizes the surfaces and surface areas, as well as the weighted runoff coefficient (the fraction of precipitation that becomes surface runoff for each surface type).

Table 10-2: Surface Types on the Project Site, Existing Conditions

Surface Type[1]	Roof[2]	Pavement & Walks	Grass & Softscape	Total
Percentage of Total Area	0%	94%	6%	100%
Surface Area (sf)	0	385,529	24,399	409,928
Runoff Coefficient	1.00	0.85	0.20	0.81

Table 10-3: Stormwater Runoff on the Project Site, Existing Conditions

Rainfall (inches)[1]	Duration (hours)[1]	Total Area (acres)	Weighted Runoff Coefficient (C)	Stormwater to SS (MG)	Sanitary to SaS (MG)
0.00	3.80	9.41	0.81	0	0.00
0.40	3.80	9.41	0.81	0.08	0.00
1.20	11.30	9.41	0.81	0.25	0.00
2.50	19.50	9.41	0.81	0.52	0.00

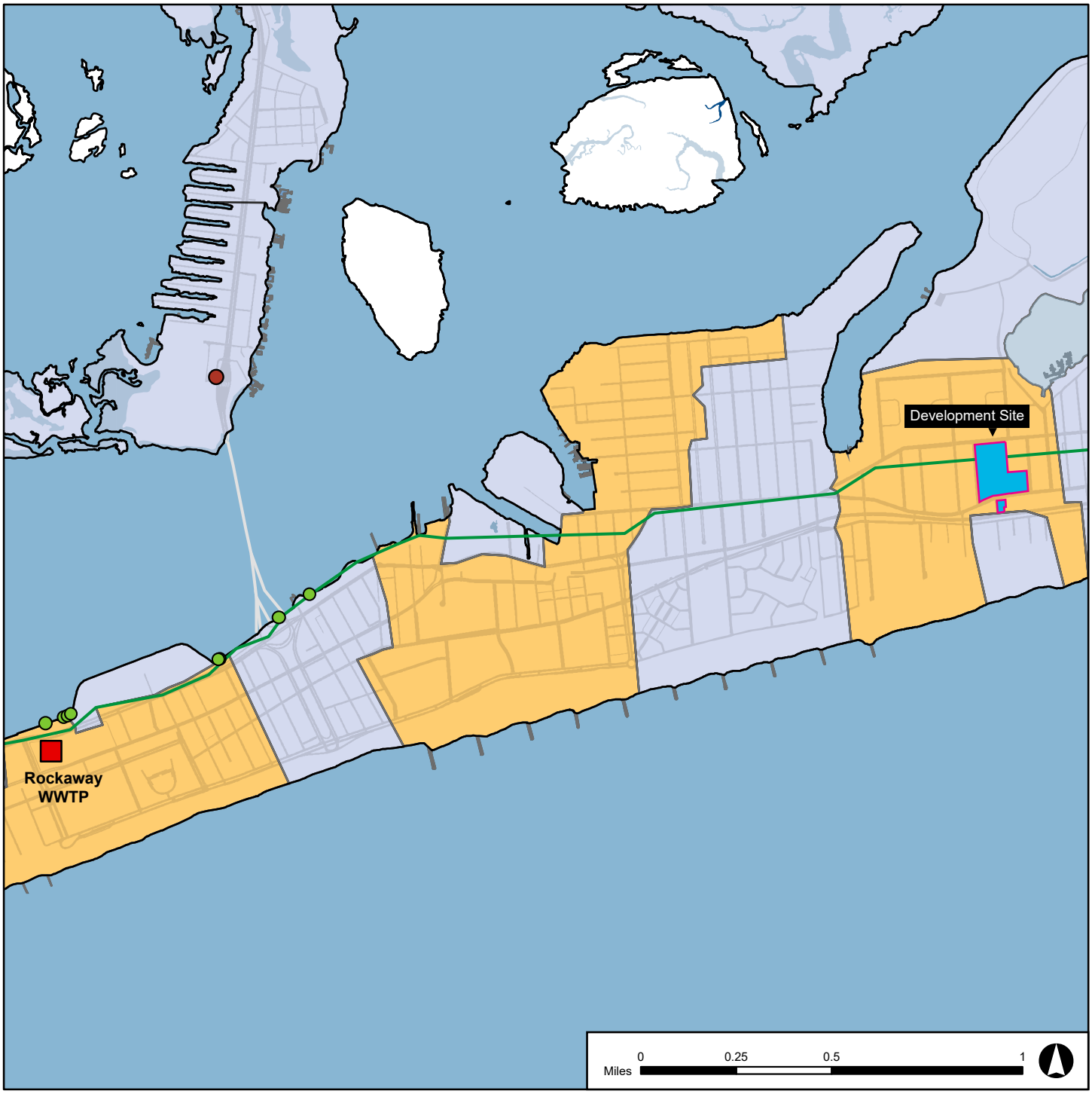
Notes:

1. Based on information provided by DEP

SS = Stormwater Sewer System

SaS = Sanitary Sewer System

MG = Million Gallons



Source: Open Sewer Atlas NYC

Development Site

Sewershed

Interceptor

CSO Outfall

Wastewater Treatment Plant

Pump Station

Direct Drainage

Separate Sewer System

ROCKAWAY WWTP SEWER SYSTEM

Figure 10-1

Peninsula Hospital Site Redevelopment

V. FUTURE WITHOUT THE PROPOSED ACTIONS (NO-ACTION CONDITION)

In the future absent the Proposed Actions (the "No-Action" condition) the Project Site would remain under the existing zoning designations, as described in Chapter 1, "Project Description." Market-rate, residential development, along with supporting retail space, would be feasible on the Project Site and would be constructed as-of-right in conformance to existing zoning designations. Absent the Proposed Actions, development on the Project Site would include 12 buildings, including approximately 482,523 gsf of residential space (providing 568 DUs), 21,659 gsf of local retail space, 800 gsf of community facility space, and 557 accessory parking spaces. The No-Action condition would result in approximately 544,982 gsf of development on the Project Site.

Infrastructure Improvements

Sewer infrastructure capital improvement projects (QED-1007) in the vicinity of the Project Site broke grounds on December 2018 and are anticipated to be completed by summer 2021, well in advance of the analysis year of 2034. These projects will include construction of new water mains, storm sewers, and sanitary sewers along Rockaway Beach Boulevard.

Water Supply

Under the No-Action condition, new 36" DEP water mains are scheduled to be completed by summer 2021 along Rockaway Beach Boulevard and would allow additional water supply connections to the Project Site. As shown in **Table 10-4: Water Consumption and Sewer Generation on the Project Site, No-Action Condition**, the anticipated water supply demand under the No-Action condition is approximately 165,864 gpd.

The existing water supply capacity available in the City with the addition of new DEP water mains along Rockaway Beach Boulevard would be sufficient to supply the additional water demand in the No-Action condition without compromising the level of service or reducing pressures in the water distribution system.

Wastewater Treatment

Under the No-Action condition, new 10" and 12" sanitary sewers scheduled to be completed by summer 2021 along Rockaway Beach Boulevard and would allow additional sanitary sewer connections to the Project Site. As shown in **Table 10-4,** the anticipated sewage demand under the No-Action condition is approximately 162,046 gpd, which would be discharged through an internal sanitary sewer system to convey sanitary flows to the sanitary sewer lines along Rockaway Beach Boulevard. Sanitary sewage would then flow eastward before travelling north along Beach 49th Street and connecting directly into a 48" branch interceptor along Beach Channel Drive. This branch interceptor connects to an interceptor at Beach 62nd Street, which takes the sanitary sewage flow directly to the Rockaway WWTP.

Table 10-4: Water Consumption and Sewer Generation on the Project Site, No-Action Condition

Use	Rate[1]	Conditions in the Future Without the Proposed Action		
		Area (gsf) / Units (DU)	Domestic Water / Wastewater Generation (gpd)	A/C (gpd)
Residential	100 gpd/person[2]	568	156,768	0
Community Facility[3]	0.10 gpd/sf	800	80	136
	A/C: 0.17 gpd/sf			
Retail[4]	0.24 gpd/sf	21,659	5,198	3,682
	A/C: 0.17 gpd/sf			
Water Consumption Subtotals			**162,046**	**3,818**
Sewage Generation Subtotal			**162,046**	
Total Water Consumption			**165,864**	
Total Wastewater Generation			**162,046**	

Stormwater Drainage and Management

Under the No-Action condition, new 18" storm sewers are scheduled to be completed by summer 2021 along Rockaway Beach Boulevard and would allow new stormwater drainage connections to the Project Site. As shown in **Table 10-5: Surface Types on the Project Site, No-Action Condition,** the Proposed Project under the No-Action condition would result in an increase in impervious surface on the project site, which is currently vacant. Anticipated stormwater discharge from the Proposed Project under the No-Action condition vary depending on the rainfall volume and duration, and range between 0.09 MG to 0.58 MG **(**see **Table 10-6: Stormwater Runoff and Wastewater Generation on the Project Site, No-Action Condition).** Collected stormwater would be discharged through an internal storm sewer system to convey stormwater flows to storm sewers along both Rockaway Beach Boulevard and Beach Channel Drive.

Table 10-5: Surface Types on the Project Site, No-Action Condition

Surface Type[1]	Roof[2]	Pavement & Walks	Grass & Softscape	Total
Percentage of Total Area	40%	60%	0%	100%
Surface Area (sf)	163,971	245,957	0	409,928
Runoff Coefficient	1.00	0.85	0.20	0.91

Table 10-6: Stormwater Runoff and Wastewater Generation on the Project Site, No-Action Condition

Rainfall (inches)[1]	Duration (hours)[1]	Total Area (acres)	Weighted Runoff Coefficient (C)	Stormwater to SS (MG)	Sanitary to SaS (MG)
0.00	3.80	9.41	0.91	0	0.03
0.40	3.80	9.41	0.91	0.09	0.03
1.20	11.30	9.41	0.91	0.28	0.08
2.50	19.50	9.41	0.91	0.58	0.13

Notes:

1. Based on information provided by DEP

SS = Stormwater Sewer System

SaS = Sanitary Sewer System

MG = Million Gallons

VI. FUTURE WITH THE PROPOSED ACTIONS (WITH-ACTION CONDITION)

The Proposed Actions would facilitate the redevelopment of the Project Site. The Proposed Project would result in an approximately 2,378,480 gsf mixed-use development, comprised of 11 buildings with approximately 2,200 income-restricted DUs, of which 1,910 DUs are intended to be affordable for households with incomes up to 80% of AMI, of which 270 units would be set aside for senior housing DUs, and 290 DUs intended to be moderate income households. In addition to the residential DUs, the Proposed Project would include approximately 74,269 gsf of retail space, approximately 83,744 gsf of community facility space, and approximately 51,601 sf of publicly-accessible open space.

Phased development of the Proposed Project is described in Chapter 1. “Project Description,” which also indicates water and sewer infrastructure improvements on the Project Site accompanying each development phase.

Water Supply

As noted above, new 36” DEP water mains are scheduled to be completed by summer 2021, before the time of the anticipated project completion year, along Rockaway Beach Boulevard and would allow additional water supply connections to the Project Site. As shown in **Table 10-7: Water Consumption and Sewer Generation on the Project Site, With-Action Condition,** the incremental additional demand from the Proposed Project is approximately 494,397 gpd, which would represent less than 1% of the City’s overall water supply.

The existing water supply capacity available in the City is sufficient to supply the additional demand in the With-Action condition without compromising the level of service or reducing pressures in the water distribution system. In consultation with DEP, it was determined that the existing water mains would be able to handle the increase in water demand, and, consequently, the Proposed Project would not result in any significant adverse impacts to water supply.

Wastewater Treatment

New 10” and 12” sanitary sewers are scheduled to be completed by summer 2021, before the time of the anticipated project completion year, along Rockaway Beach Boulevard and would allow additional sanitary sewer connections to the Project Site. The anticipated sewage demand from the Proposed Project would increase by approximately 471,353 gpd from the No-Action conditions to the With-Action condition (**Table 10-7**). This incremental increase in sanitary flow would be discharged through an internal sanitary sewer system to convey sanitary flows to the sanitary sewer lines along Rockaway Beach Boulevard. Sanitary sewage would then flow eastward before travelling north along Beach 49th Street and connecting directly into a 48” branch interceptor along Beach Channel Drive. This branch interceptor connects to an interceptor at Beach 62nd Street, which takes the sanitary sewage flow directly to the Rockaway WWTP.

This incremental increase in sanitary flow would not result in a significant adverse impact to the sewage system or the treatment capacity at the Rockaway WWTP as it is less than 0.1% of the WWTP current dry weather capacity.

Consultation with DEP determined that the Proposed Project would result in a substantial increase in sanitary flow to the adjacent sewers. Consequently, a hydraulic analysis of the existing sewer system may be needed at the time of submittal of the site connection proposal application to determine whether the existing sewer system can support the proposed higher density development and related increase in wastewater flow, or whether there will be a need to upgrade the existing sewer system. DEP is currently in process of designing a new drainage plan for this area, which would account for the proposed zoning under the Proposed Actions.

Based on the relatively low demand on the Rockaway WWTP and consultation with DEP regarding upgrades to the existing sewer infrastructure, the Proposed Project would not result in significant adverse impacts on the wastewater treatment system.

Table 10-7: Water Consumption and Sewer Generation on the Project Site, With-Action Condition

Use	Rate[1]	Conditions in the Future With-Action Condition		
		Area (gsf) / Units (DU)	Domestic Water / Wastewater Generation (gpd)	A/C (gpd)
Residential	100 gpd/person[2]	1,632	450,432	0
Community Facility[3]	0.10 gpd/sf	82,944	8,294	14,100
	A/C: 0.17 gpd/sf			
Retail[4]	0.24 gpd/sf	52,610	12,626	8,944
	A/C: 0.17 gpd/sf			
Water Consumption Subtotals			**471,353**	**23,044**
Sewage Generation Subtotal			**471,353**	
Total Water Consumption			**494,397**	
Total Wastewater Generation			**471,353**	

Stormwater Drainage and Management

New 18" storm sewers are scheduled to be completed by summer 2021, before the time of the anticipated completion year for the Proposed Project, along Rockaway Beach Boulevard and would allow new stormwater drainage connections to the Project Site. As shown in **Table 10-8:Surface Types on the Project Site, With-Action Condition**, the Proposed Project would result in a slight decrease in the total weighted runoff coefficient. Anticipated stormwater discharge from the Proposed Project would vary depending on the rainfall volume and duration, and would range between 0.09 MG to 0.57 MG **(Table 10-9: Stormwater Runoff and Wastewater Generation on the Project Site, With-Action Condition)**. Collected stormwater would be discharged through an internal storm sewer system to convey stormwater flows to storm sewers along both Rockaway Beach Boulevard and Beach Channel Drive.

Table 10-8:Surface Types on the Project Site, With-Action Condition

Surface Type[1]	Roof[2]	Pavement & Walks	Grass & Softscape	Total
Percentage of Total Area	36%	61%	3%	100%
Surface Area (sf)	146,892	251,775	11,261	409,928
Runoff Coefficient	1.00	0.85	0.20	0.89

Table 10-9: Stormwater Runoff and Wastewater Generation on the Project Site, With-Action Condition

Rainfall (inches)[1]	Duration (hours)[1]	Total Area (acres)	Weighted Runoff Coefficient (C)	Stormwater to SS (MG)	Sanitary to SaS (MG)
0.00	3.80	9.41	0.89	0.00	0.08
0.40	3.80	9.41	0.89	0.09	0.08
1.20	11.30	9.41	0.89	0.27	0.22
2.50	19.50	9.41	0.89	0.57	0.38

Notes:

1. Based on information provided by DEP

SS = Stormwater Sewer System

SaS = Sanitary Sewer System

MG = Million Gallons

The Proposed Project would also incorporate selected best management practices (BMPs) that would be required as a part of the site connection approval from DEP; the peak stormwater runoff rates would be reduced by the release of stormwater with a slowed discharge rate. Therefore, with the incorporation of appropriate BMPs that would be required as part of the site connection approval process and the planned sewer infrastructure improvement project, the overall volume of stormwater runoff and the peak stormwater runoff rate would be reduced, and there would be no significant adverse impacts on stormwater conveyance infrastructure.