

A. INTRODUCTION

The workers, residents, and visitors expected as a result of the proposed action (both the proposed Flushing Commons project and the Macedonia Plaza project associated with the remainder of the rezoning area) would create new demands for the City's water supply, sanitary sewage treatment, and stormwater discharge systems. The potential effects on those municipal services are discussed in this chapter.

B. PRINCIPAL CONCLUSIONS

Based on the existing uses present within the rezoning area, an 1,101-space municipal parking lot and the Macedonia African Methodist Episcopal (AME) Church, there are no significant demands for water supply and sanitary sewage. The proposed action, which would include new residential, commercial (including office, retail, restaurant, and possibly hotel uses), and community facility uses, would change the demand for water and wastewater services within the rezoning area.

In summary, the incremental demand for water supply from the proposed action would not adversely affect the ability of the existing system to distribute water to, or maintain water pressure for, local users. Furthermore, the increase in sanitary sewage and stormwater discharge would not cause the Tallman Island Water Pollution Control Plant (WPCP) to exceed its design capacity or its New York State Pollution Discharge Elimination System (SPDES) permit flow limit. The stormwater generated by the proposed action would not have a significant adverse impact on the combined sewer system or the Flushing River.

The proposed action would require an Amended Drainage Plan to reflect previously mapped 138th Street between 37th and 39th Avenues and the de-mapped bed of 38th Avenue between 138th Street and Union Street on the drainage plan. The Amended Drainage Plan would be completed in accordance with New York City Department of Environmental Protection (NYCDEP) requirements; the existing sewer located in the former street bed of 38th Avenue between Union Street and 138th Street will be removed. Overall, the proposed action would not result in any significant adverse impacts to water supply, sewage treatment, and combined sewer systems.

Subsequent to the publication of the DEIS, the City released the 2010 *City Environmental Quality Review (CEQR) Technical Manual* (May 17, 2010). The level of analysis conducted in this chapter is consistent with guidance in the revised 2010 *CEQR Technical Manual*. For sites located in specific drainage areas, including Flushing Bay and Creek, the revised manual requires a preliminary assessment, which includes the preparation of a NYCDEP volume calculation worksheet to determine the change in flows and volumes to the combined sewer system from the existing to proposed conditions. Since this matrix postdates publication of the Flushing Commons DEIS, it has been prepared for inclusion in the FEIS as Appendix E. The

additional information provided in the NYCDEP volume calculation worksheet does not change the principal conclusions associated with the following analysis.

C. METHODOLOGY

This assessment considers the difference between maintaining the existing uses within the rezoning area and the proposed development in the future. Pursuant to the methodologies set forth in the 2001 *CEQR Technical Manual*, the analysis examines the specific potential impacts created by the proposed action (since there are no known development projects in the surrounding area that will significantly impact the existing infrastructure in the future). As described in Chapter 1, “Project Description,” the proposed action includes the proposed Flushing Commons project and the Macedonia Plaza project associated with the remainder of the rezoning area.

Water and sewage demand is estimated based on usage rates set forth in the *CEQR Technical Manual* and as applied to the various proposed uses in the proposed action. For stormwater runoff, it is conservatively assumed that the rezoning area in the future with the proposed action is made up of only roof and pavement surfaces (which have higher stormwater runoff rates than pervious areas), since the final amount and design of pervious areas have not been determined at this time. In fact, it is specifically noted that both the proposed Flushing Commons and Macedonia Plaza projects would incorporate open space elements with an ability to capture and retain some rainfall on-site.

D. EXISTING CONDITIONS

WATER SUPPLY

New York City obtains its water supply from the Delaware, Catskill and Croton reservoir systems, operated by NYCDEP. The watersheds of the three reservoir systems extend as far as 125 miles north and west of the City, encompassing several reservoirs and lakes, with a storage capacity of over 550 billion gallons. Water is delivered from these watersheds to New York City through a network of reservoirs, aqueducts and tunnels. Within the City, networks of underground pipes distribute water to consumers. Some residents of southeast Queens obtain their water supply from New York City’s groundwater system beneath Queens.

New York City water systems provide approximately 1.1 billion gallons per day to the five boroughs as well as Westchester, Putnam, Ulster, and Orange counties. In 2005, 98 percent of New York City’s water was supplied from west of the Hudson River by the Catskill and Delaware systems located in Delaware, Greene, Schoharie, Sullivan, and Ulster counties; two percent of the City’s water supply came from the Croton system with reservoirs in Putnam, Westchester, and Dutchess counties. New York City’s Groundwater System in Queens supplied a daily average of 2.2 million gallons, less than 1 percent of the City’s total usage.

Queens draws its water supply primarily from watershed areas in the Catskill Mountains via the Catskill and Delaware systems. The Ashokan and Roundout Reservoirs collect water within the system and deliver it through the Catskill and Delaware aqueducts, then into the Kensico Reservoir in Westchester County, and then into the Hillview Reservoir in the City of Yonkers. From Yonkers, water is distributed to the City through three tunnels, City Tunnel Nos. 1, 2 and 3. City Tunnel No. 1 delivers water through the Bronx and Manhattan to Brooklyn; City Tunnel

No. 2 delivers water through the Bronx, Queens and Brooklyn to Staten Island; while City Tunnel No. 3 delivers via the Bronx and Manhattan to Queens.

Average daily water consumption in Queens is estimated at about 200 million gallons per day (mgd) and the average water pressure at the area surrounding the project site is estimated to be 65 pounds per square inch (psi). A pressure of 20 psi is the minimum water pressure acceptable for uninterrupted service and City Fire Department service requirements.

Water service is available in the water mains located within 37th Avenue, 39th Avenue, Union Street, and 138th Street adjacent to the project site (see Figure 11-1). 8-inch diameter mains exist in both 138th Street and 39th Avenue, while 12-inch and 20-inch diameter mains exist in 37th Avenue and Union Street, respectively. These mains provide service to fire hydrants abutting the project site in 37th and 39th Avenues.

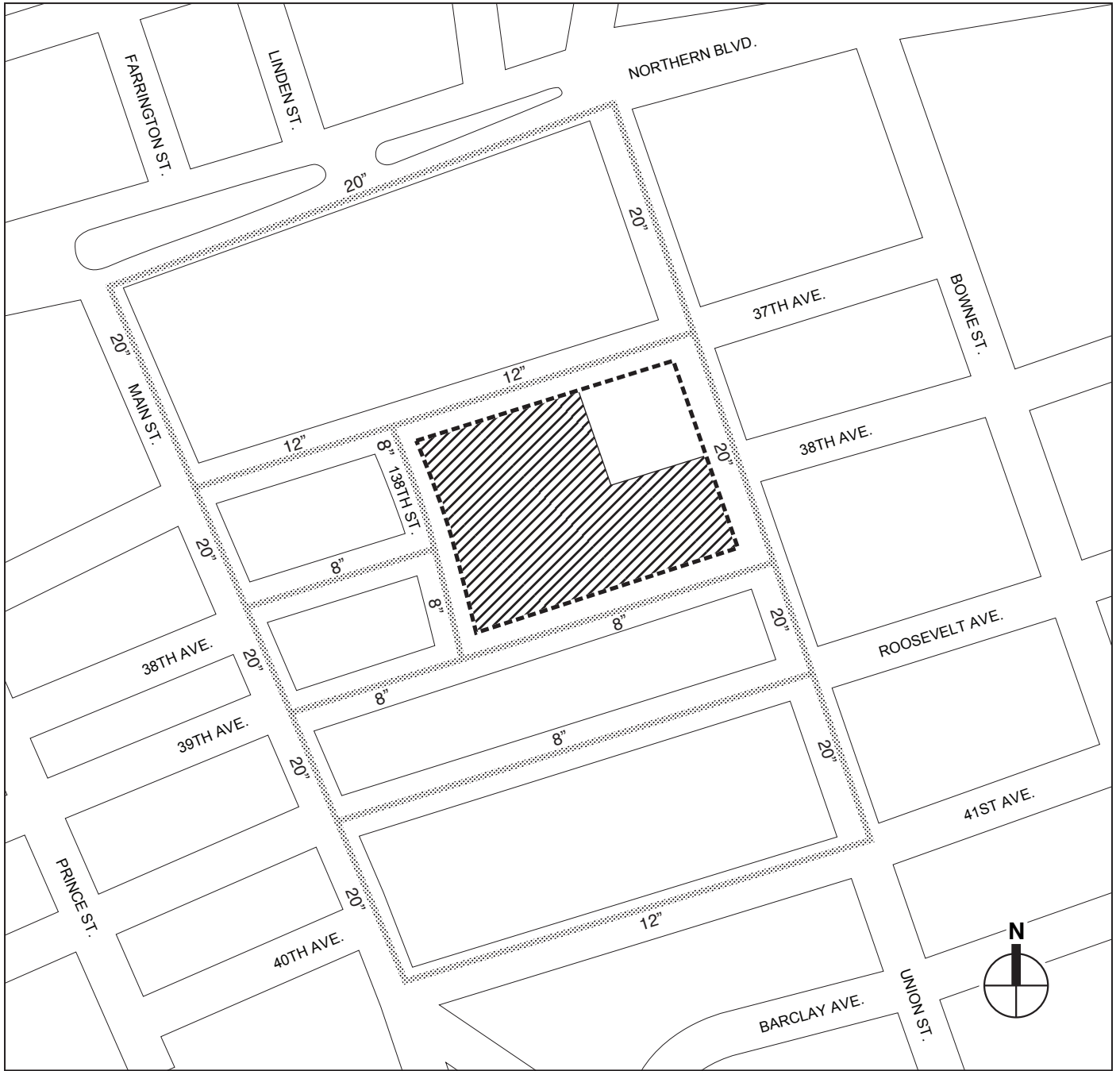
The rezoning area is largely a paved parking lot with an elevated parking level. There are no water usages or sewage generating activities in this portion of the rezoning area, and therefore the existing demand on the local water distribution system is negligible. The remainder of the rezoning area is occupied by the Macedonia AME Church, located adjacent to the parking lot to the east along Union Street. The existing demand on the local water distribution system and the sewage generating activities from this portion of the rezoning area are also negligible. The uses and demand from the existing Macedonia AME Church building would not change in the future with or without the proposed action.




SANITARY SEWAGE

The rezoning area is located in Sewerage District No. 31 in the Third Ward, an area served by the Tallman Island WPCP. The Tallman Island WPCP treats wastewater through full secondary physical and biological processes before the wastewater is discharged into the Flushing River. Secondary treatment includes the removal of a minimum of 85 percent of biological oxygen demand and total suspended solids in the influent. Effluent from this WPCP is regulated by the New York SPDES permit issued by the New York State Department of Environmental Conservation (NYSDEC). The permit specifies the maximum limit for effluent parameters that include suspended solids, fecal coliform and other pollutants. The SPDES permit specifies the treatment capacity of the Tallman Island WPCP be limited to a maximum of 80 mgd. As of July 2009, the monthly flow for the Tallman Island WPCP over the last 12-month period is 57 mgd, well below the permitted limit.

For sanitary sewage disposal, the area surrounding the rezoning area relies on a sewer system that conveys both sanitary sewage and stormwater runoff to the Tallman Island WPCP. This system comprises separate storm sewers, combined sewers (for sanitary sewage and stormwater), interceptor sewers, regulators, weirs, and diversion chambers. In the streets adjacent to the rezoning area, only combined sewers exist. During dry weather, the combined sewers convey only sanitary sewage to the Tallman Island WPCP. During and after wet weather, however, the combined sewers transport both sanitary sewage and stormwater to the Tallman Island WPCP. A diversion chamber in the regulator diverts two times design dry weather flow to the interceptor. When the combined sewer flow exceeds two times dry weather flow, it overflows a weir in the diversion chamber and this overflow is discharged to the receiving water body as combined sewer overflow (CSO).

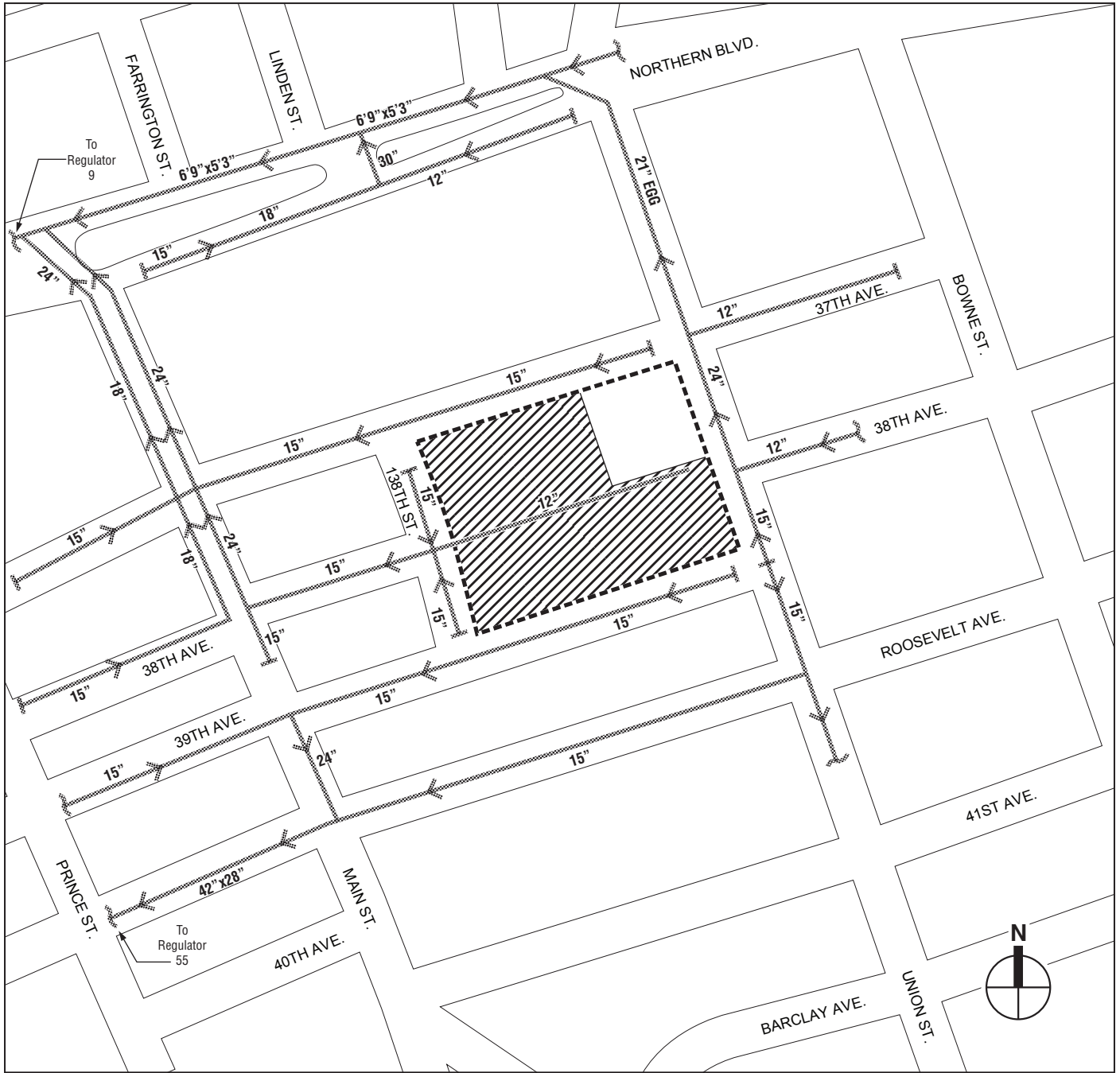
The existing combined sewers, adjacent to the rezoning area, are shown in Figure 11-2. There is a 15-inch combined sewer located beneath 39th Avenue adjacent to the site which flows west









-  Project Site
-  Rezoning Area Boundary
-  12" Water Main and Pipe Dimension

NOT TO SCALE

1.31.08



-  Project Site
-  Rezoning Area Boundary
-  12" Combined Sewer Line and Pipe Dimension
-  Combined Sewer Flow Direction
-  Combined Sewer Pipe Upstream End
-  Combined Sewer Pipe Continuation

NOT TO SCALE

Flushing Commons

from Union Street to Main Street and south to a 42-inch by 28-inch combined sewer which flows southwesterly to a diversion chamber located at the intersection of Roosevelt Avenue and College Point Boulevard then conveyed north via an 87-inch and 8-foot double barrel combined sewer to Regulator 9 at the intersection of 32nd Avenue and Linden Place. CSO is discharged to the Flushing River via a 48-inch outfall at Roosevelt Avenue and a 102-inch by 72-inch outfall through an easement between the bulkhead line and 40th Road.

There is an existing 12-inch combined sewer located on-site beneath the former 38th Avenue which flows west from Union Street to 138th Street. There is a 15-inch combined sewer beneath 138th Street which flows south from 37th Avenue to 38th Avenue and another 15-inch combined sewer in 138th Street which flows north from 39th Avenue to 38th Avenue. At the intersection of 138th Street and 38th Avenue, these three sewers flow west in a 15-inch combined sewer beneath 38th Avenue to Main Street. Additionally, there is a 15-inch combined sewer beneath 37th Avenue which flows west from Union Street to Main Street. Flow is then conveyed north in Main Street in a 24-inch combined sewer to a regulator at the intersection of Northern Boulevard and Prince Street which ultimately flows to Regulator 9.

Furthermore, adjacent to the rezoning area there is also a 15-inch combined sewer in Union Street between 38th and 39th Avenues that flows north into a 24-inch combined sewer in Union Street between 37th and 38th Avenues. The 24-inch sewer flows north to Northern Boulevard and ultimately to Regulator 9. Beyond Regulator 9, dry weather flow is conveyed in a 7-foot by 7-foot interceptor to Tallman Island WPCP. Flow in excess of the dry weather flow is discharged to the Flushing River at 32nd Avenue.

STORMWATER

As discussed above, the area surrounding the rezoning area is served by combined sewers that flow to the Tallman Island WPCP and, if necessary, are diverted to overflow discharges into the Flushing River as noted above. During wet weather overflow events, the stormwater runoff generated from the rezoning area is discharged via a diversion chamber into the two separate outfalls discussed above.

The rezoning area is approximately 5.8 acres in area and is 96 percent covered by paved impervious surfaces. The remaining 4 percent is the location of the existing Macedonia AME Church building. In order to ensure a sewer system with adequate capacity for its tributary area, NYCDEP uses a “design storm” for which the sewer pipe and related appurtenances must have capacity. The calculated volumes are based on NYCDEP Design Guidelines for developed areas with rainfall intensity (I) of 5.95 inches per hour. The runoff coefficient (C) is based on standard NYCDEP rates and represents the percent of precipitation that becomes surface flow and does not filter into the ground. Runoff rates are presented in cubic feet per second (cfs). Given the existing development, assumed as 96 percent paved area and 4 percent roof area, of the rezoning area, the runoff coefficient is 0.86 (assuming a coefficient of 0.85 for paved areas and 1.00 for roof areas). The Rational Formula for calculating runoff is:

$$Q = C \times I \times A \text{ where}$$

Q is runoff in cubic feet per second (cfs),

C is the runoff coefficient,

I is the rainfall intensity,

A is the area in acres

Therefore, the existing design flow stormwater runoff from the rezoning area is calculated to be 29.54 cfs. Since it is assumed that there are no stormwater detention systems currently in place

at the 40 year old parking lot/structure and Macedonia AME Church building, it is also assumed that this runoff is currently accommodated by the existing combined sewer system.

E. THE FUTURE WITHOUT PROPOSED ACTION

In the future without the proposed action, water consumption, sewage generation and stormwater runoff are not expected to change significantly from existing conditions.

WATER SUPPLY

There would be no change in use at the rezoning area in the future without the proposed action and, as a result, no change in future water demand is expected. No major improvements to the water supply system are planned by the City in the vicinity of the rezoning area.

SANITARY SEWAGE

Based on the yearly average sewage flows into the Tallman Island WPCP since January 2000, there has been an average 1.54 percent increase in average flow. Provided this trend continues, the average yearly sewage flow in the future without the proposed action in 2013 is expected to be approximately 63 mgd, which would not exceed the SPDES permit level of 80 mgd.

STORMWATER

Stormwater runoff amounts from the rezoning area are not expected to change in the future without the proposed action.

F. PROBABLE IMPACTS OF THE PROPOSED ACTION

The hotel scenario for the proposed Flushing Commons project was conservatively assumed for this analysis because the hotel scenario, as compared to the office scenario, would result in a greater demand for domestic water and therefore also a greater generation of sewage.

WATER SUPPLY

The water mains in 37th Avenue, 39th Avenue, Union Street, and 138th Street would be available for new service connections. These mains are expected to provide adequate water service for the proposed action.

Table 11-1 summarizes the expected water demand for the proposed action by the mix of anticipated uses for the proposed Flushing Commons project and the Macedonia Plaza project associated with the remainder of the rezoning area. In total, the proposed action can be anticipated to increase water usage by 434,677 gallons per day (gpd).

While this new demand represents an increase over and above conditions in the future without the proposed action, the incremental demand for water is not expected to place enough of a load on the water supply system to necessitate any upgrades to the existing supply system. The 434,677 gpd that would be required by the proposed action would represent approximately 0.040 percent of the City's total daily demand, a minimal increase. In addition, local water pressure is not expected to be significantly affected. As set forth in the *CEQR Technical Manual*, the small changes in demand are unlikely to affect the water overall consumption rate and water pressure and would therefore not result in any significant adverse impacts on the water supply.

Flushing Commons

**Table 11-1
Projected Water Consumption**

Use	Unit	Size (Square feet)	Rate	Consumption (gallons per day)
Residential	2,046 (persons)	843,632	112 gpd/ person	229,152
Retail/ Public Use				
Domestic		241,500	0.17 gpd/sf	41,055
Air Conditioning		241,500	0.17 gpd/sf	41,055
Restaurant*				
Domestic		33,500	0.17 gpd/sf	5,695
Air Conditioning		33,500	0.17 gpd/sf	5,695
Hotel				
Domestic	250 (rooms)	130,000	150 gpd/room/occupant	37,500
Function Space		12,000	0.17 gpd/sf	2,040
Air Conditioning		130,000	0.10 gpd/sf	13,000
Commercial/ Office				
Domestic	467 (persons)	110,000	25 gpd/person	11,675
Air Conditioning		110,000	0.10 gpd/sf	11,000
Community Facility*				
Domestic		108,264	0.17 gpd/sf	18,405
Air Conditioning		108,264	0.17 gpd/sf	18,405
TOTAL	NA	NA	NA	434,677
Sources: Rates from <i>CEQR Technical Manual</i> .				
* Assessment based on retail/public use consumption rates				
Projected demand from both the proposed Flushing Commons project and the Macedonia Plaza project				

SANITARY SEWAGE

The estimated sewage generated by the rezoning area is 345,522 gpd which represents a negligible increase in demand of less than one percent of the 2005 average daily flow of 60 mgd or future flows to the plant that could reach 70 mgd. This amount of sewage is approximately 0.43 percent of the SPDES limit to the Tallman Island WPCP, a relatively small increase. As set forth in the *CEQR Technical Manual*, the small changes in sewage generation are unlikely to affect the overall sewage treatment capacity and would therefore not result in any significant adverse impacts on the sewage system supply.

STORMWATER

The rezoning area in the future with the proposed action would include roof areas, pavement, and some landscaped pervious open space areas. Based on area calculation estimated from the proposed Flushing Commons and Macedonia Plaza projects' site plans, this assessment conservatively assumes roof area and pavement would occupy 47 and 53 percent of the rezoning area, respectively. Based on this assumption, the runoff coefficient is estimated to be 0.92. The estimated design stormwater runoff is 31.77 cfs, an increase of 2.23 cfs compared to existing conditions. As noted above, both the proposed Flushing Commons and Macedonia Plaza projects would have open space resources with some pervious surfaces, including planting beds and accessible lawn areas. These areas would likely retain rainfall on-site, however the design for these areas has not been finalized and therefore the above estimate is conservative because it does not account for any pervious areas.

To meet NYCDEP flow requirements, detention facilities would also be installed to discharge at an allowable rate into the City sewer system. To account for the increase in sanitary flow due to the rezoning during wet weather conditions, the allowable storm flow discharge from the

Flushing Commons project site within this rezoning area should be decreased by an amount equal to the difference in sanitary flow before and after the rezoning; any proposed detention system should be designed based on this revised allowable storm flow.

In summary, runoff from the proposed action would not pose an adverse impact on the sewer system, nor increase the likelihood of combined sewer overflow conditions in the area. *