Chapter 8: Infrastructure and Utilities

A. INTRODUCTION AND SUMMARY OF FINDINGS

This chapter discusses the Proposed Project's potential effects on the local and regional water supply and sanitary sewer systems. The chapter provides a description of existing conditions and an assessment of future conditions with and without the Proposed Project.

The Proposed Project would connect to the existing public water infrastructure located in the vicinity of the Project Sites. The Applicant has conferred with the City of Yonkers Water Bureau regarding the capacity and pressure of the existing water supply mains. Preliminary analysis determined that the existing water infrastructure serving the Teutonia Site would not have sufficient capacity and pressure to adequately service increased demand from the Teutonia Project. Therefore, the Applicant would implement improvements required by the City to be made within Prospect Street and Buena Vista Avenue. At the Chicken Island Site, the City determined the water supply infrastructure would be sufficient, but the Applicant would make certain improvements within James Street and John Street requested by the City. The Applicant is coordinating with the City of Yonkers Water Bureau to perform additional evaluation of the capacity and pressure of the existing water supply infrastructure surrounding the North Broadway Site. However, the existing 12-inch water main in Locust Hill Avenue may not have adequate capacity to service the North Broadway Project. If it does not, then the Applicant would install approximately 2,000 linear feet of new water main in Locust Hill Avenue from Ashburton Avenue to Palisade Avenue.

The Proposed Project would utilize the existing combined public sanitary and storm sewer and the existing public sanitary sewer located in the vicinity of each Project Site. In order to accommodate the increased sanitary flow from the Proposed Project, portions of the combined sewer within Buena Vista Avenue, Locust Hill Avenue, Baldwin Place, James Street, John Street, and New School Street may need to be replaced with new larger pipes. In order to confirm this and appropriately size any new, larger, pipes that may be required, a video inspection and flow monitoring program of the surrounding collection sewers was developed with the City's Engineering Department and is currently underway. This program will also assist the City in identifying the location and extent of existing sewer pipes that could be relined as part of the Applicant's overall mitigation program. To mitigate the increase in sanitary sewer flows from the Proposed Project, the Applicant will separate stormwater runoff from the combined sewer system where practical, including the from the entirety of the Chicken Island Site. On-site stormwater detention would help mitigate stormwater flows that would continue to discharge to combined sewers. To further mitigate the increased flow, additional inflow/infiltration ("I&I") mitigation would be provided at a three-to-one ratio, in accordance with Westchester County policy. This would be accomplished by a combination of relining lengths of existing sewers as directed by the City and payment to the City of a fee in lieu in the amount of the cost of any required I&I work not performed by the Applicant, for implementation by the City of other City-wide improvements.

For the reasons described herein, the Proposed Project would not have a significant adverse impact on water supply or sanitary sewer systems.

B. EXISTING CONDITIONS

A description of the existing conditions of the water supply, sanitary, and combined sanitary/storm sewer infrastructure is provided below for each Project Site. While some of the existing infrastructure is up to 100 years old, there are some recently installed components, as discussed below.

B.1. WATER SUPPLY

The City provides water service to the Project Sites. Yonkers obtains drinking water from the New York City Water Supply System, primarily sourced from the West-of-Hudson Watershed, which includes the Catskill and Delaware reservoir systems located approximately 100 miles northwest of Yonkers. In the City, there are more than 400 miles of water lines, more than 4,500 fire hydrants, three water towers, five pump stations, one booster pump station, four disinfectant stations, two corrosion treatment facilities, and multiple pressure regulators and altitude valves. The City supplied 8.848 billion gallons of water throughout its distribution system in 2019.[1] Average daily citywide consumption was 24.2 million gallons, with an average daily per capita usage of 123 gallons. Approximately 24.1 percent of annual usage was used for firefighting purposes, hydrant flushing, and distribution system leaks.

The City is served via high- and low-pressure service mains within the distribution system due to the varying elevations throughout the City. The Project Sites are in the low-pressure service zone and therefore are served by gravity rather than a pump station.

B.1.a. Teutonia Site

According to records from the City of Yonkers Water Bureau and a site survey (see **Appendix B-1**), an existing six-inch diameter water main services the existing buildings and properties along Buena Vista Avenue (see **Figure 8-1**).

At the Applicant's request, the City of Yonkers Water Bureau performed hydrant flow tests in April 2021 to aid in the evaluation of the capacity and pressure of the existing water supply infrastructure surrounding the Teutonia Site. The hydrant flow tests were performed on the six-inch cast iron water main within Buena Vista Avenue. A flow test is conducted using two hydrants: one hydrant has a pressure gauge and the second has the flow gauge. The pressure measured pre-flow is the static pressure and the residual is the pressure measured under flow. That information is then used to estimate the available fire flow at 20 psi, as that is the lowest pressure at which the fire pumps in the building and on the trucks should draw water from the system. A summary of testing locations and results are provided in **Table 8-1** and further detail is provided in **Appendix I-1**.

[1] City of Yonkers Annual Water Quality Report, 2019.

Table 8-1
Teutonia Site Fire Flow Testing Results

Hydrant	Location	Static Pressure (psi)	Residual Pressure (psi)	Flow Rate (gpm)	Calculated Fire Flow at 20 psi (gpm)
Buena Vista Ave Pressure Hydrant (#1446)	46 Buena Vista Ave (immediately south of Hudson St)	95	70	N/A	N/A
Buena Vista Ave Flow Hydrant (#1445)	76 Buena Vista Ave (intersection of Buena Vista Ave and Prospect St)	N/A	N/A	830	1,495

Notes: psi = pounds per square inch, gpm = gallons per minute
Source: Appendix I-1

B.1.b. Chicken Island Site

According to records from the City of Yonkers Water Bureau, existing water supply infrastructure, including several fire hydrants, are located in the vicinity of the Chicken Island Site. Water mains in the vicinity of the Chicken Island Site range in size from four-inch to 12-inch. **Table 8-2** lists the known existing water main locations and sizes, and **Figure 8-1** shows their locations.

Table 8-2
Chicken Island Site Existing Water Supply Infrastructure

Street Name	Water Main Size and Material
New School Street	12-inch CIP
Nepperhan Avenue	12-inch CIP
New Main Street	12-inch Unknown
Palisade Avenue	12-inch CIP
John Street	6- and eight-inch Unknown
James Street	6-inch DIP
Henry Herz Street	12-inch CIP
Ann Street	12-inch DIP
Former Engine Place	4-inch Unknown

Notes: CIP = cast iron pipe, DIP = ductile iron pipe
Sources: Records provided by City of Yonkers Water Bureau, City of Yonkers Engineering Department

There is currently a four-inch water service loop that runs north from John Street and then west within an easement. This four-inch water loop services a fire hydrant and the City of Yonkers Fire House to the northeast of the Chicken Island Site. The 12-inch water main in Ann Street and Henry Herz Street was recently constructed during Phase III of the City's Saw Mill Daylighting Project adjacent to the Chicken Island Site.

At the Applicant's request, the City of Yonkers Water Bureau performed hydrant flow tests in December 2020 to determine the capacity and pressure of the existing water supply infrastructure surrounding the Chicken Island Site. The hydrant flow tests were performed on both pressure and flow hydrants located on Henry Herz Street, Palisades Avenue, and New School Street. The hydrant systems are served by 12-inch cast iron water mains. A summary of testing locations and results are provided in **Table 8-3** with further detail provided in **Appendix I-1**.

Table 8-3
Chicken Island Site Fire Flow Testing Results

Hydrant	Location	Static Pressure (psi)	Residual Pressure (psi)	Flow Rate (gpm)	Calculated Fire Flow at 20 psi (gpm)
Henry Herz St Pressure Hydrant	Intersection of Henry Herz St and Nepperhan Ave	85	80	N/A	N/A
Henry Herz St Flow Hydrant	Henry Herz St south of Ann St	N/A	N/A	1,160	4,617
Palisades Ave Pressure Hydrant (#1317)	Intersection of Palisades Ave and New School St	84	80	N/A	N/A
Palisades Ave Flow Hydrant (#1315)	15 Palisades Ave (intersection of Palisade Ave and James St)	N/A	N/A	880	3,934
New School St Pressure Hydrant (#1546)	Intersection of New School St and Elm St	82	76	N/A	N/A
New School St Flow Hydrant (#1545)	New School St, 200 feet north of Nepperhan Ave	N/A	N/A	1,190	4,204

Notes: psi = pounds per square inch, gpm = gallons per minute
Source: Appendix I-1

B.1.c. North Broadway Site

According to records from the City of Yonkers Water Bureau and information provided on the site survey for the North Broadway Site (see **Appendix B-3**), existing water supply infrastructure and multiple existing fire hydrants are located in the vicinity of the North Broadway Site. Water mains in the vicinity of the North Broadway Site vary in size, as summarized in **Table 8-4** and illustrated in **Figure 8-1**.

Table 8-4
North Broadway Site Existing Water Supply Infrastructure

Street Name	Water Main Size and Material
Locust Hill Avenue	12-inch CIP
Baldwin Place	4- and eight-inch Unknown
Bell Place	4-inch Unknown and eight-inch DIP
Overlook Terrace	4- and 6-inch Unknown
North Broadway	6- and 12-inch DIP, eight-inch CIP
Palisade Avenue	12-inch CIP
Cromwell Place	4- and 12-inch Unknown
Manor House Square	12-inch Unknown
Wells Avenue	6-inch DIP

Notes: CIP = cast iron pipe, DIP = ductile iron pipe
Sources: Records provided by City of Yonkers Water Bureau, City of Yonkers Engineering Department, **Appendix I-1**

The City of Yonkers Water Bureau performed hydrant flow tests at both pressure and flow hydrants located on Locust Hill Avenue, Bell Place, and North Broadway in February 2012, November 2019, and April 2021. The Locust Hill Avenue hydrants are served by a 12-inch cast iron water main; the Bell Place hydrant is served by an eight-inch ductile iron water main, and the North Broadway hydrants are served by an eight-inch cast iron water main. At the Applicant's request, the City of Yonkers Water Bureau performed additional

hydrant flow tests in April 2021 to determine the capacity and pressure of the existing water supply infrastructure surrounding the North Broadway Site. A summary of testing locations and results are provided in **Table 8-5** with further detail provided in **Appendix I-1**.

Table 8-5
North Broadway Site Fire Flow Testing Results

Hydrant	Location	Static Pressure (psi)	Residual Pressure (psi)	Flow Rate (gpm)	Calculated Fire Flow at 20 psi (gpm)
February 2012 Testing					
Locust Hill Ave Pressure Hydrant (#1453)	87 Locust Hill Ave	44	37	N/A	N/A
Locust Hill Ave Flow Hydrant (#1452)	50 Locust Hill Ave	N/A	N/A	880	1,707
November 2019 Testing					
Locust Hill Ave Pressure Hydrant (#1453)	87 Locust Hill Ave	46	38	N/A	N/A
Locust Hill Ave Flow Hydrant (#1452)	50 Locust Hill Ave	N/A	N/A	970	1,833
April 2021 Testing					
Locust Hill Ave Pressure Hydrant (#1152)	40 Locust Hill Ave (at intersection with Cromwell Place)	45	36	N/A	N/A
Bell Place Flow Hydrant (#1473)	1 Bell Place (at intersection with Baldwin Place)	N/A	N/A	1,110	1,931
North Broadway Pressure Hydrant (#1122)	North Broadway at intersection with Manor House Square	98	94	N/A	N/A
North Broadway Flow Hydrant (#1121)	18 North Broadway	N/A	N/A	750	3,735

Notes: psi = pounds per square inch, gpm = gallons per minute
Source: Appendix I-1

B.2. SANITARY AND COMBINED SANITARY/STORM SEWER

The Project Sites are serviced by both sanitary sewer lines and combined stormwater and sanitary sewer systems owned and operated by the City.

The sanitary sewer lines flow to the Yonkers Joint Wastewater Treatment Plant (WWTP) owned and operated by Westchester County, which is permitted to treat 120 million gallons per day (MGD) as a 12-month rolling average. The plant has a maximum hydraulic flow rate of 330 MGD, which allows it to handle combined stormwater and sanitary flows during storms. The 12-month average flow taken from the 2019 Wastewater Treatment Annual Report was 84.8 MGD.

B.2.a. Teutonia Site

An existing sanitary sewer line and combined sanitary and storm sewer main serves the Teutonia Site and the surrounding properties along Buena Vista Avenue (see **Figure 8-2**). An 18-inch sanitary sewer line exists along the west side of Buena Vista Avenue and is owned by the City. In the center of Buena Vista Avenue is a 16-inch vitrified combined sewer which is owned by

Westchester County. The two systems combine at a manhole just south of the Intersection of Hudson Street and Buena Vista Avenue. This combined sewer continues north where it connects to a 72-inch County-owned trunk line at the intersection of Main Street and Buena Vista Avenue. The 72-inch line flows to a pump station where it is then pumped via a 54-inch force main to the WWTP.

B.2.b. Chicken Island Site

An existing combined sanitary and storm sewer system serves the Chicken Island Site and the surrounding properties along Palisade Avenue, New School Street, New Main Street, and Nepperhan Avenue (see **Figure 8-2**). Two combined sewer lines of 12- and 15-inches are located under New School Street and converge at the intersection with John Street where they connect to an 18-inch combined sewer. The 18-inch combined sewer continues west on John Street and then north on James Street in a 20-inch sewer toward Palisade Avenue where it ultimately connects to a 48-inch combined sewer. Along with the 48-inch combined sewer in Palisade Avenue, there is a 78-inch County-owned Saw Mill Trunk Sewer, which does not convey wastewater from the Chicken Island Site. The 78-inch County sewer runs from Elm Street and continues through Getty Square and down Main Street. Another 12-inch combined sewer is located near the New School Street and Nepperhan Avenue intersection. This sewer line flows into an 18-inch sewer line down Nepperhan Avenue which discharges into a 48-inch combined sewer in New Main Street. The two 48-inch combined sewers in New Main Street and Palisade Avenue join at Getty Square and continue to the Westchester County-owned Main Street Pump Station. The pump station pumps wastewater to the WWTP. **Table 8-6** lists the known existing sewers in the area surrounding the Chicken Island Site.

Table 8-6
Chicken Island Site Existing Sewer Infrastructure

Street Name	Sewer Type	Sewer Size and Material	Flow Direction	Approximate Sewer Depth
New School Street (North half)	Combined Sewer	12-inch VTP	South (to John St)	10–12 FT
New School Street (South half)	Combined Sewer	15-inch VTP	North (to John St)	10–16 FT
John Street	Combined Sewer	18-inch VTP	West/Southwest (to James St)	12–20 FT
James Street	Combined Sewer	18- and 20-inch VTP	North (to Palisade Ave)	12–15 FT
Palisade Avenue	Combined Sewer	48-inch Brick	West/Southwest (to Pump Station)	14–20+ FT
Palisade Avenue	County Trunk Sewer (WCDEF)	78-inch unknown	West/Southwest (to Pump Station)	20+ FT
New School Street (Southern end)	Combined Sewer	12-inch VTP	South	6–10 FT
Nepperhan Avenue	Combined Sewer	18-inch VTP and 24x36-inch Brick	Southwest	10–15 FT
New Main Street	Combined Sewer	36 and 48-inch Brick	Northwest	15–20+ FT

Notes: WCDEF = Westchester County Department of Environmental Facilities, VTP = vitrified tile pipe, FT = feet
Sources: Records provided by City of Yonkers Engineering Department

B.2.c. North Broadway Site

Two existing combined sanitary and storm sewer systems that converge downstream of the North Broadway Site serve the Site and surrounding properties along Baldwin Place, Overlook Terrace, Locust Hill Avenue and North Broadway (see **Figure 8-2**). An 18-inch combined sewer in Locust Hill Avenue flows south toward Palisade Avenue into a 48-inch brick combined sewer that continues through Getty Square and down Main Street. Another 12-inch combined sewer is located in Baldwin Place, and, through a series of manholes, the 12-inch sewer comes down the slope and connects to an 18-inch combined sanitary and storm sewer system in North Broadway between the intersections of Manor House Square and Wells Avenue. The 18-inch combined sewer flows toward and ultimately down Manor House Square. There is also an 18-inch combined sewer line in North Broadway that flows northwest until it connects to the 18-inch sewer in Manor House Square. This 18-inch line eventually meets up with the 48-inch combined sewer conveying the rest of the North Broadway Site's wastewater before reaching the Westchester County-owned Main Street Pump Station. The pump station pumps wastewater to the WWTP.

Table 8-7 lists the known existing sewers in the area surrounding the North Broadway Site according to records provided by the City of Yonkers Engineering Department and information provided on the site survey for the North Broadway Site (see **Appendix B-3**).

Table 8-7
North Broadway Site Existing Sewer Infrastructure

Street Name	Sewer Type	Sewer Size and Material	Flow Direction	Approximate Sewer Depth
Locust Hill Avenue	Combined Sewer	18-inch CIP	South (to Palisade Ave)	8–10 FT
Palisade Avenue	Combined Sewer	48-inch Brick	West/Southwest (to Getty Sq)	14–20+ FT
Baldwin Place	Combined Sewer	12-inch CIP	West (to North Broadway)	8–12 FT
North Broadway (North end)	Combined Sewer	18-inch CIP	South (to Manor House Sq)	10 FT
North Broadway (South end)	Combined Sewer	18-inch CIP	North/Northwest (to Manor House Sq)	Unknown
Manor House Square	Combined Sewer	18-inch Unknown	West (to Warburton Ave)	Unknown

Notes: CIP = cast iron pipe, FT = feet
Sources: Records provided by City of Yonkers Engineering Department, **Appendix B-3**

C. FUTURE WITHOUT THE PROPOSED PROJECT

There are no known plans for the City to upgrade utility infrastructure in the vicinity of the Teutonia or North Broadway Sites. In the vicinity of the Chicken Island Site, the City of Yonkers Water Bureau has indicated that the 12-inch water main in Nepperhan Avenue may be replaced in the future with a new 20-inch water main, which would increase water supply and pressure to the area. No other utility improvements in the vicinity of the Chicken Island Site are known at this time.

Other pending and approved projects proximate to the Proposed Project are described in Chapter 2, "Land Use, Zoning, and Public Policy." Some of these projects would increase water and sewer demand and would, in some cases, use the same infrastructure that would serve the Proposed Project. Further, some of these projects may include or require improvements to certain infrastructure, as identified during the review, approval, and construction of each project.

The Westhab, Inc. affordable housing project, located at 76 Locust Hill Avenue, is anticipated to be completed in 2023 and would add a water demand of approximately 19,000 gallons per day (GPD) and a sewer demand of approximately 18,370 GPD. No off-site improvements to infrastructure are anticipated as a result of this project.

Without the Proposed Project, there would be no increase in water and sewer demand from the Project Sites and no immediate impacts to the water and sewer infrastructure surrounding the Project Sites would occur. In the instance of a development on the Project Sites under existing City zoning regulations, the demand from the Project Sites is indicated in **Table 8-8** below.

Table 8-8
Development Under Existing Zoning Proposed Sanitary Sewer/Water Demand

Location	Proposed Use	SF	# of Employees	# of Units	# of Bedrooms	Flow Rate	Design Flow (GPD)
Teutonia Site	Retail	12,432	-	-	-	0.1 GDP/SF	1,243
	Commercial/ Office	-	-	-	-	15 GPD/Empl.	0
	Residential	-	-	460	713	110 GPD/Bdrm.	78,430
Chicken Island Site	Retail	69,983	-	-	-	0.1 GPD/SF	6,998
	Commercial/ Office	28,925	193	-	-	15 GPD/Empl.	2,895
	Residential	-	-	2,026	3,144	110 GPD/Bdrm.	345,840
North Broadway Site	Retail	9,700	-	-	-	0.1 GPD/Empl.	970
	Commercial/ Office	10,291	69	-	-	15 GPD/Empl.	1,035
	Residential	-	-	347	509	110 GPD/Bdrm.	59,290
Total							469,702

Note: # of Employees for commercial/retail space based on 1 employee per 150 square feet of floor area.
Sources: Flow rates based on "NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems," dated March 5, 2014.

D. FUTURE WITH THE PROJECT (BUILD CONDITION)

This section estimates the water and sanitary sewer demand generated by the Proposed Project and discusses the potential for this increased demand to require improvements to existing City-owned infrastructure.

D.1. WATER SUPPLY

D.1.a. Teutonia Site

The estimated water demand for the Teutonia Project would be approximately 155,440 GPD. This calculation utilizes the same assumptions as the sanitary sewer flow rate calculations, discussed below. The anticipated fire demand for the Teutonia Project would be 1,000 gallons per minute (gpm) for each of the two towers. The Teutonia Project would be served by the water main in Buena Vista Avenue and each tower would have one six-inch domestic and one eight-inch fire service connection (see Drawing C-06, Drainage and Utility Plan in **Appendix C-1**). The water services from the proposed buildings would be constructed of Class 56 Ductile Iron Pipe (DIP).

The Teutonia Project would increase demand on the existing water main in Buena Vista Avenue. Based on hydrant flow tests performed in 2021, the City of Yonkers Water Bureau determined that the existing six-inch water main in Buena Vista Avenue is not adequate to service the Teutonia Project. Consequently, the Applicant proposes to extend the existing 12-inch water main starting at the intersection of Prospect Street and Hawthorne Avenue to the Teutonia Site. The new 12-inch water main would continue west to the intersection of Prospect Street and Buena Vista Avenue where it would run north and connect to the existing 12-inch water main at Main Street (see **Appendix I-2**). The new 12-inch water main would replace approximately 900 linear feet of existing water main. The existing

connections currently supplied by the six-inch line would be reconnected to the 12-inch water main, including existing fire hydrants.

According to the City of Yonkers website, there is a service fee associated with water usage that is billed twice a year. The fee is calculated as $4.04 per 100 cubic feet of usage. Based on the anticipated water usage for the Teutonia Project, the service fee per billing cycle would be $151,108 ($302,216 per year) with a Basic Service Charge of $126.58.[2]

D.1.b. Chicken Island Site

The Chicken Island Project would increase demand on the water mains that are located in the vicinity of the Chicken Island Site. Each proposed building would have separate connections to the existing water mains for domestic and fire service. The Applicant would upgrade existing water mains as required by the City of Yonkers Water Bureau to provide sufficient water flow and pressure to the Chicken Island Site. The estimated water demand for the Chicken Island Project would be approximately 350,550 GPD. This calculation utilizes the same assumptions as the sanitary sewer flow rate calculations discussed below. The anticipated fire demand for each of the buildings would be 1,000 gpm. The water services from the proposed buildings would be constructed of Class 56 DIP.

As the Chicken Island Site contains multiple buildings in multiple phases, each building would have separate domestic and fire service connections to the water supply infrastructure surrounding the Site. **Table 8-9** describes water service connection information for the Chicken Island Project (see also Drawings UT-1 and UT-2, Utility Plan Sheets 1 and 2 in **Appendix C-3**).

Table 8-9
Chicken Island Project Proposed Water Service Connections

Building	Domestic Water Service Size/Material	Fire Water Service Size/Material	Connection Location	Connecting Water Main Size/Material
Building 1	6-inch DIP	8-inch DIP	Palisade Ave	12-inch DIP
Building 1A	4-inch DIP	6-inch DIP	James St	8-inch DIP
Building 2	6-inch DIP	8-inch DIP	New School St	12-inch DIP
Building 3	6-inch DIP	8-inch DIP	Former Henry Herz St	12-inch DIP
Building 4	6-inch DIP	8-inch DIP	Former Henry Herz St	12-inch DIP
Building 5	6-inch DIP	8-inch DIP	New School St	12-inch DIP

Note: DIP = ductile iron pipe

The proposed Building 1 footprint would be over the existing easement for the four-inch water loop that currently services a fire hydrant and the City of Yonkers Fire House. The existing four-inch water service loop in former Engine Place would need to be cut, capped, and removed from the Chicken Island Site (see Drawings DM-1 and UT-1 of **Appendix C-3**). Prior to its removal, the current water services to the City of Yonkers Fire House would need to be reconnected to the existing 12-inch water main in Palisade Avenue. The existing fire hydrant located on John Street near the intersection with James Street would be relocated

[2] Calculations were prepared by PS&S using information provided on the Yonkers website at https://www.yonkersny.gov/live/taxes-water/water-bills.

and reconnected to the new 12-inch water main in James Street to service the Chicken Island Site (see Drawings DM-1 and UT-1 of **Appendix C-3**). Following completion of these reconnections, the existing four-inch water loop would be removed within the footprint of the proposed Building 1 footprint. The existing easement for this water loop would be extinguished in coordination with the City.

At the Applicant's request, a site walk was conducted with the City of Yonkers Water Bureau to review proposed building and roadway locations, existing known water main infrastructure, including services to nearby buildings, and fire hydrant locations. With the results of the hydrant flow tests, the City of Yonkers Water Bureau has determined that the existing water supply infrastructure in the roadways surrounding the Chicken Island Site are generally sufficient and in good condition. Improvements requested by the City are discussed under Section E, "Mitigation Measures Proposed," below.

Table 8-10 describes the water service fee per billing cycle associated with each building of the Chicken Island Project. The total water service fee would be $681,562 per year. The water service fee also carries a Basic Service Charge of $126.58 per billing cycle.

Table 8-10
Chicken Island Project Water Service Fees

Building	Water Usage (GPD)	Water Usage (cf/day)	Water Usage Per Cycle (cf/day)	Water Service Fee Per Semi-Annual Cycle
Building 1/1A	116,490	15,572	2,802,960	$113,243
Building 2	73,600	9,839	1,771,020	$71,549
Building 3	73,600	9,839	1,771,020	$71,549
Building 4	43,680	5,839	1,051,020	$42,463
Building 5	43,180	5,772	1,038,960	$41,977
Total	350,550	46,855	8,434,980	$340,781

Notes: GPD = gallons per day, cf/day = cubic feet per day
Sources: Calculations were prepared by PS&S using information provided on the Yonkers website at https://www.yonkersny.gov/live/taxes-water/water-bills.

D.1.c. North Broadway Site

The North Broadway Project would increase demand on the water mains that are located in the vicinity of the North Broadway Site. Each building would have a separate connection to the existing water mains for domestic and fire service (see Drawing C-06 in **Appendix C-9**). If deemed necessary by the City of Yonkers Water Bureau, the Applicant would upgrade existing water mains to provide sufficient water flow and pressure to the North Broadway Site. The estimated water demand for the North Broadway Project would be approximately 114,680 GPD. This calculation utilizes the same assumptions as the sanitary sewer flow rate calculations discussed below. The anticipated fire demand for each of the buildings associated with the North Broadway Project would be 1,000 gpm. The two residential towers would each be served by one (1) six-inch domestic and one (1) eight-inch fire service, which would be connected to a new water main extension within Overlook Terrace that would be supplied by the water main in Locust Hill Avenue (see Drawing C-06 in **Appendix C-9**). The water services

from the proposed buildings would be constructed of Class 56 DIP. Existing water service connections in Overlook Terrace would remain unchanged. New buildings and retail spaces fronting North Broadway would connect to the existing 6-inch and 8-inch water mains in North Broadway.

The Applicant has performed hydrant flow tests to determine the capacity and pressure of the existing water supply infrastructure surrounding the North Broadway Site and the improvements that would be needed, as discussed below in Section E, "Mitigation Measures Proposed."

Table 8-11 shows the water service fee per billing cycle associated with each building of the North Broadway Project. The total water service fee would be $222,966 per year. The water service fee also carries a Basic Service Charge of $126.58 per billing cycle.

Table 8-11
North Broadway Project Water Service Fees

Building	Water Usage (GPD)	Water Usage (cf/day)	Water Usage Per Cycle (cf/day)	Water Service Fee Per Cycle
Building 1	53,950	7,212	1,298,160	$52,446
Building 2	60,730	8,118	1,461,240	$59,037
Total	114,680	15,330	2,759,400	$111,483

Notes: GPD = gallons per day, cf/day = cubic feet per day
Sources: Calculations were prepared by PS&S using information provided on the Yonkers website at https://www.yonkersny.gov/live/taxes-water/water-bills.

D.2. SANITARY SEWER

The Proposed Project would generate new wastewater and increase flows to the sanitary sewer and combined sanitary and storm sewer systems that serve the Project Sites. As described below, the increased flow will be mitigated by separating stormwater runoff from the combined sewer system, where feasible, as well as relining various sections of sewer pipe to reduce inflow and infiltration. Nevertheless, the Proposed Project may require the replacement of portions of the existing combined sanitary and storm sewers with larger pipes within Buena Vista Avenue, Locust Hill Avenue, Baldwin Place, James Street, John Street, and New School Street. In order to confirm this and appropriately size any new, larger, pipes that may be required, a video inspection and flow monitoring program of the surrounding collection sewers was created with the City's Engineering Department and is currently underway. This program will also assist the City in identifying the location and extent of existing sewer pipes that could be relined as part of the Applicant's overall mitigation program.

A written request has been sent to Westchester County Department of Environmental Facilities to confirm the WWTP has the available treatment capacity for the estimated demand from each Project Site. Based on the 2019 Westchester County Environmental Facilities Annual Report, the 2019 actual flow average to the Yonkers Treatment facility was 84.8 MGD. The design flow of the facility is 120 MGD; however, the hydraulic capacity is 330 MGD. The NYSDEC permitted flow is 120 MGD as a 12-month rolling average. Based on this data, there is adequate capacity at the treatment facility for the Proposed Project. In addition, the Applicant will be removing infiltration and inflow at a rate of three-to-one, including separating storm sewers wherever possible.

D.2.a. Teutonia Site

The Teutonia Site is vacant; previous connections to the existing sanitary sewer infrastructure in Buena Vista Avenue were removed in 2013 prior to the demolition and remediation of the Teutonia Hall building and no connections remain. The Teutonia Project would connect to the 18-inch sanitary sewer in Buena Vista Avenue (see Drawing C-06, Drainage and Utility Plan in **Appendix C-1**). The sanitary lateral connection from Building 1 would be a 12-inch diameter pipe, and the connection from Building 2 would be a 15-inch diameter pipe. The sanitary laterals from the proposed buildings would be constructed of Class 54 DIP.

The sanitary sewer discharge rate for the Teutonia Project was estimated at approximately 155,440 GPD as indicated in **Table 8-12**.

Table 8-12
Teutonia Project Proposed Sanitary Sewer Flow Rate

Location	Proposed Use	# of Units	# of Bedrooms	Flow Rate (GPD/Bdrm.)	Design Flow (GPD)
Building 1	Studio	128	128	110	14,080
	1 Bedroom	153	153	110	16,830
	2 Bedroom	178	356	110	39,160
	3 Bedroom	51	153	110	16,830
Building 2	Studio	99	99	110	10,890
	1 Bedroom	119	119	110	13,090
	2 Bedroom	138	276	110	30,360
	3 Bedroom	40	120	110	13,200
Podium	Retail	10,000	-	0.1 (GPD/sf)	1,000
Total					155,440

Sources: Flow rates based on "NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems," dated March 5, 2014.

Based on discussions with the Yonkers Engineering Department, known pipe sizes, and the age of the pipes, the additional flow from the Teutonia Project may require the replacement of the combined sanitary sewer in Buena Vista Avenue from Prospect Street to Main Street. In order to confirm this and appropriately size any new, larger, pipe that may be required, a video inspection and flow monitoring program was created with the City's Engineering Department. Proximate to the Teutonia Site, this program includes the sewer within Buena Vista Avenue extending from the Teutonia Site to the intersection between Main Street and Buena Vista Avenue approximately 400 linear feet to the north.

The Teutonia Project's stormwater drainage system would connect to the combined sanitary and storm sewer in Buena Vista Avenue. The Teutonia Project would detain stormwater internally prior to discharging to the combined sewer. Additional information regarding the stormwater connection to this combined sewer is provided in Chapter 9, "Stormwater Management." As discussed further in Chapter 9, "Stormwater Management," the nearest separate storm sewers are located on the opposite side of the railroad tracks and at the intersection of Main Street and Buena Vista Avenue. Connections from the Teutonia Site would be

infeasible due to Metro North Railroad restrictions and a multitude of existing utility crossings along Buena Vista Avenue.

According to the City of Yonkers website, there is a service fee associated with sewer usage that is billed twice a year. The fee is calculated as $1.00 per 100 cubic feet of usage. Based on the sewer usage for the Teutonia Project, the service fee per cycle would be $37,403 ($74,806 per year) with a Basic Service Charge of $126.58 per billing cycle.[3]

D.2.b. Chicken Island Site

Currently the Chicken Island Site has no sanitary sewer connections as the Site contains no buildings. The Chicken Island Project would redevelop the Chicken Island Site with a five-building, mixed-use development. Each building would have at least one connection to the existing sanitary and combined sanitary and storm sewers in the adjacent streets. The stormwater generated by the Chicken Island Project would be collected and routed to the Saw Mill River to reduce impacts on the combined sewer system, as discussed further in Chapter 9, "Stormwater Management."

The sanitary sewer discharge rate for the Chicken Island Project was estimated at approximately 350,550 GPD, as shown in **Table 8-13** below.

Table 8-13
Chicken Island Project Proposed Sanitary Sewer Flow Rate

Location	Proposed Use	SF	# of Employees	# of Units	# of Bedrooms	Flow Rate	Design Flow (GPD)
Building 1/1A	Retail	39,000	-	-	-	0.1 GPD/SF	3,900
	Office	17,000	114	-	-	25 GPD/Empl.	1,710
	Residential	-	-	650	1,008	110 GPD/Bdrm.	110,880
Building 2	Retail	10,000	-	-	-	0.1 GPD/SF	1,000
	Residential	-	-	425	660	110 GPD/Bdrm.	72,600
Building 3	Retail	10,000	-	-	-	0.1 GPD/SF	1,000
	Residential	-	-	425	660	110 GPD/Bdrm.	72,600
Building 4	Retail	10,000	-	-	-	0.1 GPD/SF	1,000
	Residential	-	-	250	388	110 GPD/Bdrm.	42,680
Building 5	Retail	5,000	-	-	-	0.1 GPD/SF	500
	Residential	-	-	250	388	110 GPD/Bdrm.	42,680
Total							350,550

Notes: # of Employees for commercial/retail space based on 1 employee per 150 square feet of floor area.
Sources: Flow rates based on "NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems," dated March 5, 2014.

As the Chicken Island Site contains multiple buildings in multiple phases, each building would have a separate connection to the sewer infrastructure surrounding the Chicken Island Site. **Table 8-14** describes sanitary sewer connection information that would be required throughout the Chicken Island Project (see also Drawings UT-1 and UT-2, Utility Plan Sheets 1 and 2 in **Appendix C-3**). All

[3] Calculations were prepared by PS&S using information provided on the Yonkers website at https://www.yonkersny.gov/live/taxes-water/water-bills.

connecting sewer depths are approximate based on information from the City of Yonkers Engineering Department records and would need to be verified in the field prior to construction. The sanitary laterals from the proposed buildings would be constructed of Class 54 DIP.

Table 8-14
Chicken Island Project Proposed Sanitary Sewer Connections

Building	Sanitary Sewer Lateral Size/Material	Connection Location	Connecting Sewer Type	Connecting Sewer Size/Material	Connecting Sewer Depth
Building 1	15-inch DIP	James St	Combined Sewer	20-inch VTP	12 FT
Building 1A	6-inch DIP	John St	Combined Sewer	18-inch VTP	15 FT
Building 2	15-inch DIP	John St	Combined Sewer	18-inch VTP	15 FT
Building 3	15-inch DIP	New School St	Combined Sewer	15-inch VTP	12–15 FT
Building 4	12-inch DIP	New School St	Combined Sewer	12-inch VTP	10 FT
Building 5	12-inch DIP	New School St	Combined Sewer	15-inch VTP	12–15 FT
Notes: DIP = ductile iron pipe, VTP = vitrified tile pipe, FT = feet					

Based on discussions with the Yonkers Engineering Department, known pipe sizes, and the age of the pipes, the additional flow from the Chicken Island Project may require the replacement or relining of the combined sanitary sewers in James Street, John Street, and New School Street. In order to confirm this, as well as identify the location and extent of existing sewer pipes that could be relined as part of the Applicant's overall mitigation program, a video inspection and flow monitoring program was created with the City's Engineering Department. Proximate to the Chicken Island Site, the combined sanitary and storm sewers being analyzed are the following:

- Approximately 875 linear feet of combined brick sewer in New Main Street, extending from Nepperhan Avenue to Getty Square, of sizes varying between 36 to 48 inches.
- Approximately 365 linear feet of combined brick sewer in Nepperhan Avenue, extending from School Street to New Main Street, of sizes varying between 30 inches and 24x36 inches.
- Approximately 175 linear feet of combined sewer in the intersection of Nepperhan Avenue and New School Street, of sizes varying between 12 and 18 inches.
- Approximately 500 linear feet of 48-inch combined brick sewer in Palisade Avenue, extending from the newly proposed intersection at Centre Street and Palisade Avenue to Getty Square.
- Approximately 265 linear feet of combined sewer in James Street, extending from John Street to Palisade Avenue, of sizes varying between 18 and 20 inches.
- Approximately 365 linear feet of 18-inch combined sewer in John Street, extending from New School Street to James Street.
- Approximately 215 linear feet of 12-inch combined sewer in New School Street, extending north from John Street.

- Approximately 260 linear feet of 15-inch combined sewer in New School Street, extending south from John Street.

The stormwater drainage systems for the Chicken Island Site, including all internal building systems, would connect to existing, separate storm sewer pipes prior to discharging to the nearby Saw Mill River. In addition, some existing stormwater infrastructure in the surrounding roadways would be separated from the combined sewer via a new pipe system and discharged to the Saw Mill River. In total, stormwater runoff from approximately 1.5 acres of drainage area would be separated and removed from the existing combined sewer system, reducing the overall flow to the existing combined sewer system. Additional information with respect to the stormwater discharge to these combined sewers is provided in Chapter 9, "Stormwater Management."

Table 8-15 shows the sewer service fee per billing cycle associated with each building of the Chicken Island Project. The total sewer service fee would be $168,704 per year. The sewer service fee also carries a Basic Service Charge of $126.58 per billing cycle.

Table 8-15
Chicken Island Project Sewer Service Fees

Building	Sewer Usage (GPD)	Sewer Usage (cf/day)	Sewer Usage Per Cycle (cf/day)	Sewer Service Fee Per Semi-Annual Cycle
Building 1/1A	116,490	15,572	2,802,960	$28,031
Building 2	73,600	9,839	1,771,020	$17,710
Building 3	73,600	9,839	1,771,020	$17,710
Building 4	43,680	5,839	1,051,020	$10,511
Building 5	43,180	5,772	1,038,960	$10,390
Total	350,550	46,855	8,434,980	$84,352

Notes: GPD = gallons per day, cf/day = cubic feet per day
Sources: Calculations were prepared by PS&S using information provided on the Yonkers website at https://www.yonkersny.gov/live/taxes-water/water-bills.

D.2.c. North Broadway Site

The existing buildings on the North Broadway Site have multiple connections to the adjacent combined sanitary and storm sewers. The North Broadway Project would redevelop the property with two mixed-use residential towers and street level commercial space on North Broadway. Each tower would have at least one connection to the combined sewers adjacent to the North Broadway Site. A 12-inch sanitary sewer lateral from Building 1 would connect to the existing 18-inch sanitary sewer main in North Broadway. A 12-inch sanitary sewer lateral from Building 2 would connect to the existing 12-inch sanitary sewer main in Baldwin Place. New buildings and retail spaces fronting North Broadway would connect to the existing 18-inch combined sewer in North Broadway.

The sanitary sewer discharge rate for the North Broadway Project was estimated at approximately 114,680 GPD, as shown in **Table 8-16** below.

Based on discussions with the Yonkers Engineering Department, known pipe sizes, and the age of the pipes, the additional flow from the North Broadway Project may require the replacement of the combined sanitary sewer in Locust

Hill Avenue from Overlook Terrace to Palisade Avenue and in Baldwin Place from Locust Hill Avenue to its terminus at North Broadway. In order to confirm this and appropriately size the new, larger, pipe that may be required, a video inspection and flow monitoring program was created with the City's Engineering Department. Proximate to the North Broadway Site, this program includes the combined sanitary and storm sewers in the following locations:

- Approximately 250 linear feet of 18-inch combined sewer in Locust Hill Avenue, extending from Overlook Terrace to the intersection between Palisade Avenue and Locust Hill Avenue.
- Approximately 300 linear feet of 12-inch combined sewer in Baldwin Place, extending west to North Broadway.
- Approximately 450 linear feet of 18-inch combined sewer in North Broadway, extending north and south from Manor House Square.
- Approximately 200 linear feet of combined sewer in Manor House Square, extending from North Broadway to Warburton Avenue.

The stormwater drainage system for the main towers and parking garage of the North Broadway Project would make a connection to the combined sanitary and storm sewer in Locust Hill Avenue. The North Broadway Project would detain stormwater internally prior to discharging to the combined sewer. The retail spaces along North Broadway would make a connection to the separate storm sewer system that discharges into the nearby Saw Mill River. Additional information with respect to the stormwater discharge to the combined sewer is provided in Chapter 9, "Stormwater Management."

Table 8-17 shows the sewer service fee per billing cycle associated with each building of the North Broadway Project. The total sewer service fee would be $55,190 per year. The sewer service fee also carries a Basic Service Charge of $126.58 per billing cycle.

Table 8-16
North Broadway Project Proposed Sanitary Sewer Flow Rate

Location	Proposed Use	SF	# of Employees	# of Units	# of Bedrooms	Flow Rate	Design Flow (GPD)
Building 1	Retail	15,000	-	-	-	0.1 GPD/SF	1,500
	Commercial /Office	13,000	75	-	-	15 GPD/Empl.	1,300
	Residential	-	-	300	465	110 GPD/Bdrm.	51,150
Building 2	Retail	2,000	-	-	-	0.1 GPD/SF	200
	Commercial /Office	8,000	53	-	-	15 GPD/Empl.	800
	Residential	-	-	350	543	110 GPD/Bdrm.	59,730
Total							114,680

Notes: # of Employees for commercial/retail space based on 1 employee per 150 square feet of floor area.
Sources: Flow rates based on "NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems," dated March 5, 2014.

Table 8-17
North Broadway Project Sewer Service Fees

Building	Sewer Usage (GPD)	Sewer Usage (cf/day)	Sewer Usage Per Cycle (cf/day)	Sewer Service Fee Per Cycle
Building 1	53,950	7,212	1,298,160	$12,982
Building 2	60,730	8,118	1,461,240	$14,613
Total	114,680	15,330	2,759,400	$27,595

Notes: GPD = gallons per day, cf/day = cubic feet per day
Sources: Calculations were prepared by PS&S using information provided on the Yonkers website at https://www.yonkersny.gov/live/taxes-water/water-bills.

E. MITIGATION MEASURES PROPOSED

E.1. WATER SUPPLY

E.1.a. Teutonia Site

Based on hydrant flow tests performed in 2021, the City of Yonkers Water Bureau determined that the existing six-inch water main in Buena Vista Avenue is not adequate to service the Teutonia Project. Consequently, the Applicant proposes to extend the existing 12-inch water main starting at the intersection of Prospect Street and Hawthorne Avenue to the Teutonia Site. The new 12-inch water main would continue west to the intersection of Prospect Street and Buena Vista Avenue where it would run north and connect to the existing 12-inch water main at Main Street (see **Appendix I-2**). The new 12-inch water main would replace approximately 900 linear feet of existing water main. The existing connections currently supplied by the six-inch line would be reconnected to the 12-inch water main, including existing fire hydrants. The water main extension for the Teutonia Site would require approval from the City of Yonkers Engineering Department and the Westchester County Department of Health (WCDOH) prior to construction.

E.1.b. Chicken Island Site

The City of Yonkers Water Bureau has requested an upgrade of the water main in James Street, currently a 6-inch DIP, to an 8-inch DIP to complete the overall water service loop that is proposed to be constructed as part of the Chicken Island Project. This upgrade would include the construction of a new 12-inch water main extending from the existing 12-inch water mains in Ann Street and the former Henry Herz Street, constructed during the Phase 3 of the City's Saw Mill River Daylighting Project, and would connect to the existing 12-inch water main in Palisade Avenue (see Drawings UT-1 and UT-2, Utility Plan Sheets 1 and 2 in **Appendix C-3**).

E.1.c. North Broadway Site

Hydrant flow tests performed in April 2021 confirmed previous statements from the City of Yonkers Water Bureau that the existing 12-inch water main in Locust Hill Avenue is a low-pressure main and would not have adequate pressure to service the North Broadway Project. To mitigate this, the Applicant would install approximately 2,000 linear feet of new water main in Locust Hill Avenue from Ashburton Avenue to Palisade Avenue (see Drawing C-06, Drainage and Utility

Plan in **Appendix C-9**). The water main extension for the North Broadway Site would require approval from the City of Yonkers Engineering Department and the WCDOH prior to construction.

E.2. SANITARY SEWER

In order to accommodate the increased sanitary flow from the Proposed Project, portions of the combined sewer within Buena Vista Avenue, Locust Hill Avenue, Baldwin Place, James Street, John Street, and New School Street may need to be replaced with new, larger, pipes. In order to confirm this and appropriately size the new, larger, pipe that may be required, a sewer televising and flow monitoring program has been developed in collaboration with Yonkers Engineering Department. This program will also assist the City in identifying the location and extent of existing sewer pipes that could be relined as part of the Applicant's overall mitigation program.

To mitigate the increased sanitary sewer flow from the Proposed Project, the Applicant will separate stormwater runoff from the combined sewer system where practical. The entirety of the stormwater runoff from the Chicken Island Site and from some of the surrounding roadways will be separated from the combined sewer system and would be conveyed to the nearby Saw Mill River, reducing approximately 1.5 acres of drainage area runoff from the combined sewer. For the stormwater flow that would still be connected to the combined sewer system, the detention provided for on-site runoff will provide a measured reduction to overall flows reaching the combined sewer. To further mitigate the increased flow, additional I&I mitigation would be provided at a three-to-one ratio, in accordance with Westchester County policy. This would be accomplished by a combination of relining lengths of existing sewers as directed by the City and payment to the City of a fee in lieu in the amount of the cost of any required I&I work not performed by the Applicant, for implementation by the City of other City-wide improvements. ✷