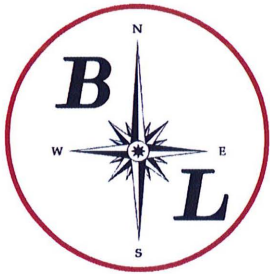


67 Maiden Lane
Kingston, New York 12401
845.338.7622
845.338.7660 fax
dmlarios@blengineers.com

Brinnier & Larios, P.C.



**Preliminary Report
Water Supply and Wastewater Capacity
The Kingstonian
City of Kingston, New York**

July 8, 2019

Prepared for:

City of Kingston Planning Board

Prepared by:

Brinnier & Larios, P.C.

***Professional Engineers & Land Surveyors
67 Maiden Lane, Kingston, NY 12401***

A handwritten signature in black ink, appearing to read 'Dennis M. Larios'.

Dennis M. Larios, P.E.
N.Y.S.P.E. Lic. No. 058747

KINGSTONIAN PROJECT: PRELIMINARY REPORT ON WATER SUPPLY & WASTEWATER CAPACITY

I. INTRODUCTION:

The **Kingstonian Project** is a proposed urban redevelopment project located at the former Uptown Kingston Parking Garage and the current Herzog's Supply Company warehouse, and the Uptown Grill(see location map-Appendix A). The project encompasses 2.4 acres of land and a portion of Fair Street Extension.

The project is proposed to consist of the following elements:

- * 129-131 Market Rate Residential Apartments
- * 32 Room Hotel
- * 8,000 Sq. Ft. of General Retail Space(mixed commercial use)
- * 420 space parking garage

The purpose of this narrative is to outline the water and sewer requirements for the project and the general approach proposed for water supply and sanitary sewer service.

II. PROPOSED WATER SUPPLY AND WASTEWATER FLOW REQUIREMENTS

A. PROJECTED WASTEWATER FLOWS and WATER SUPPLY DEMAND:

The New York State Department of Environmental Conservation "Design Standards for Intermediate Sized Wastewater Treatment Systems", March 2014, includes hydraulic loading rates for the proposed uses(reference: Table B-3 of Standards). The design flow for the project is summarized as follows:

Type of Use	Units	Flow Per Unit	Total Flow (gpd)
Apartments-per bedroom	185 bedrooms	110 gpd	20,350
Hotels-per room	32 rooms	110 gpd	3,520
Retail-per Sq. Ft.	8000 sq. ft.	0.1 gpd	800
Restaurant – per seat	70	35 gpd	2,450
Swimming Pool –per swimmer	120	10 gpd	1,200
TOTAL ESTIMATED FLOW			28,320

TOTAL DAILY FLOW ESTIMATE = 28,320 gallon per day=20 gpm
PEAK HOURLY FLOW ESTIMATE (5 x ave) = 5 x 20 gpm =100 gpm

It is noted that the DEC Hydraulic Loading Tables are design standards. Historically usage in the City of Kingston and surrounding apartment complexes has been approximately 50% of the above standards.

KINGSTONIAN PROJECT: PRELIMINARY REPORT ON WATER SUPPLY & WASTEWATER CAPACITY

B. WASTEWATER CONVEYANCE

It is proposed to convey the wastewater to the City of Kingston Sanitary Sewer System. Approximately 50% of the flow can be conveyed by gravity to the North Front Street Sanitary Sewer; and the remainder of flow would be transmitted to the Schwenk Drive Sanitary Sewer. A map of the City of Kingston Sanitary Sewer System in this area is included as Appendix B of this report.

The North Front Street sanitary sewer is 12 inch diameter, and flows by gravity to the Washington Avenue interceptor sewer. The Schwenk Drive sanitary sewer is an 8 inch diameter sanitary sewer and flows to the Frog Alley Pump Station, where wastewater is pumped to the North Front Street gravity sewer at Frog Alley/North Front Street intersection.

From Washington Avenue, there is gravity flow to and through the Washington Avenue tunnel to the **dual siphon system**(the dual siphon is also referred to as the **Rondout Interceptor**) located on lower Wilber Avenue. The dual siphon system connects directly to the Kingston Wastewater Treatment Facility on East Strand.

A review of pump run times at the Frog Alley Pump Station was performed with the assistance of the City of Kingston Public Works Department. The Station has two, vertical centrifugal pumps, with reputed capacity of 200-300 gpm. Total pump run times are summarized as follows:

Month/2018	Pump 1 (hrs)	Pump 2 (hrs)	Total Hours-Month	% of Run-Time
Jan	6	6	12	1.6%
Feb	6	6.1	12.1	1.7%
March	6.3	7.2	13.5	1.8%
April	5.6	8.1	13.7	1.8%
May	5.8	7.9	13.7	1.8%
June	5.2	5.9	11.1	1.6%
July	5.9	6.6	11.5	1.7%
Aug	6.2	9.0	15.2	2.1%
Sept	5.4	9.6	15.0	2.1%
Oct	7.5	39.60(1)	47.1	6.3%
AVERAGE	6.0	10.6	16.6	2.3%

(1) Extreme Flood Event in October may have caused storm overflow into Pump Station

The pump station results indicate that there is significant surplus capacity in the Frog Alley Pump Station. The additional flow of between 14,160 gpd-28,320 gpd will not adversely impact the pump station, as it will continue to function at a small percentage of its capacity. Specifically, with one pump in service, the run times will increase as follows:

All flow from Project to Pump Station: 28,320 gallons /250 gpm = 114 minute

50% of flow from Project to Pump Station: 14,160 gallons/250 gpm = 57.5 minutes
(likely scenario)

**KINGSTONIAN PROJECT: PRELIMINARY REPORT ON WATER SUPPLY &
WASTEWATER CAPACITY**

It is projected that the pump run time at the Frog Alley Pump Station will increase by 57.5 minutes per day, or approximately 1 hour per day.

This would increase the total run time at the pump station to 46 hours per month(existing plus proposed) and this would yield a total pump run percentage of 6.25% .

C. WASTEWATER TREATMENT

The City of Kingston Wastewater Treatment Facility has a design capacity of 6.8 MGD, and discharges to the Rondout Creek. The facility has an excellent operating record relative to compliance with SPDES Permit limits.

The most recent comprehensive review of the City of Kingston Wastewater Treatment Facility was performed by Malcom Pirnie, Inc. in October, 2008. At that time, a review of the Flows at the Kingston WWTF yielded an average daily flow of 5.0 MGD. The WWTF has a permitted flow (SPDES Permit No. 3-5108-00044-0003) and design capacity of 6.8 MGD.

Average daily flow at the WWTF was 4.3 MGD in 2016 and 4.83 MGD in 2017. It is noted that flows at the WWTF were higher in 2018 (5.7 MGD) due to excessive and unusual rainfall amounts (approximately 50% higher than normal for the year).

There are unused allocations of flow capacity for the Port Ewen Sewer District(Town of Esopus) and the Washington Avenue Sewer District(Town of Ulster). These commitments could, over time, lead to an additional flow demand of 0.34 MGD. This leaves in excess of 1 MGD of capacity in balance for projects within the City of Kingston.

The Malcom Pirnie Report included flow allocations for future projects in the City of Kingston, including the Hudson Landing Project on North Street (443,630 gpd), Sailors Cove on North Street (110,410 gpd) and the redevelopment of the parking garage property, now the Kingstonian Project(58,550 gpd). The AVR Project is no longer an active project and the land is reputedly being sold to Scenic Hudson. The Sailors Cove project is defunct and is no longer being pursued. Additionally, the Parking Garage Project flow requirement is reduced to 28,320 gpd. Collectively, the above changes reflect a reduction in wastewater flow projections of 584,270 gallons per day.

Estimated Balance of Capacity of Kingston WWTF = (from 2008 Malcom Pirnie Report)	=	1.0 MGD +/- not including above referenced reductions of 0.584 MGD
--	---	--

Estimated Total Daily From Kingstonian Project	=	0.028 MGD
--	---	-----------

Percent of Remaining Capacity Assigned to Kingstonian Project	=	
		0.028 MGD/1.0 MGD= 2.85%

KINGSTONIAN PROJECT: PRELIMINARY REPORT ON WATER SUPPLY & WASTEWATER CAPACITY

D. WATER SUPPLY

Water supply to the project would be from the Kingston Water Department(KWD). Service to the site would be from a 16 inch diameter transmission main located on North Front Street. Water pressure in this area of the City ranges from 65psi -75psi, which is adequate for servicing the project's domestic flow requirement and fire flow requirements. The KWD owns and maintains land, supply and treatment facilities located in the Towns of Ulster and Woodstock in Ulster County. The KWD's primary source headwaters, the Mink Hollow Stream, originates in Greene County.

The following water source and treatment components are included in the KWD's facilities:

Raw Water Reservoir (Cooper Lake):

Capacity: 1.2 Billion Gallons (BG)
Safe Yield: 6 MGD
(watershed/reservoir system)

Treatment: 8 MGD Nominal Capacity Filter Plant
(Originally Constructed in 1899, with subsequent upgrades)

Based on recent data, the Kingston Water Department produced approximately 4.1 MGD in 2017 and 4.1 MGD in 2018 at its filter plant. The Town of Ulster is allowed to purchase up to 700,000 gpd from the KWD for the Ulster Water District and other outlying districts (East Kingston, Spring Lake, Hillside Acres, Sawkill Road/Cherry Hill, Glenerie). This purchase amount is included in the total water produced figures provided above.

Specific requirements(metering, water tap, backflow prevention), looping) for the Kingstonian Project will be subject to detailed review and approval by the Kingston Water Department. The purpose of this report is to demonstrate that the Kingston Water Department has adequate supply to serve the project.

With a safe yield capacity of 6 MGD and an average daily demand of 4.1 MGD, the balance of capacity is approximately 1.9 MGD. The water demand for the Kingstonian Project is 0.0283 MGD which represents approximately 1.5% of the remaining capacity of the system.

KINGSTONIAN PROJECT: PRELIMINARY REPORT ON WATER SUPPLY & WASTEWATER CAPACITY

III. SUMMARY AND CONCLUSIONS

1. The proposed Kingstonian Project has an estimated water and sewer capacity requirement of 28,320 gallons per day. This total does not include a credit from prior flow at the Uptown Grill restaurant, which was recently closed and will be demolished as part of the proposed project.
2. A review of the wastewater conveyance system capacity in the area was performed, with specific focus on the Frog Alley Pump Station. The City of Kingston Department of Public Works provided “pump run” data which indicates that the pumps runs only 16.6 hours per month, or 2.3 percent of the time. It is projected that pump run times will increase to approximately 6.25% of pump run percentage with the additional wastewater flow generation from the project.
As exhibited by the low pump run times, the sanitary sewer line on Schwenk Drive has very few users and low flows(bank branches, offices, car dealership, fire house). The lowest capacity of this line (assume worst case slope of 0.5%) is 420 gpm. The project will add a maximum peak flow to this sewer line of 98 gpm, or approximately 23 % of peak flow capacity. It is the further intention of the project to direct 50% of the sanitary flow to the larger sanitary main on North Front Street. This would reduce the flow to both the Schwenk Drive sanitary sewer and the Frog Alley Pump Station.
3. The City of Kingston Wastewater Treatment Facility has a balance of capacity of approximately 1 MGD(1,000,000 gallons per day), and this balance included allowances for several large projects which have not advanced. (i.e. AVR project will allocation of 0.584 MGD and Uptown Garage with allocation of 0.059 MGD). In either case, the estimate follow of the Kingstonian Project represents only 2.85% of the 1 MGD capacity reserve, and 48% of prior reserved capacity for this project. .
4. The City of Kingston Water Supply has a safe yield of 6 MGD and currently produces approximately 4.1 MGD for customers in the City of Kingston and Town of Ulster. The water demand for the Kingstonian Project represents 1.5% of the available capacity of the water system. Additionally, the project is served from a major transmission line in North Front Street (16 inch diameter), with adequate flow and pressure to serve the project.
5. The Kingstonian Project will not have a significant impact on the City of Kingston Sanitary Sewer System or the City of Kingston Water Supply System.

APPENDICES:

The following appendices are included as part of this application:

- Appendix A- United States Geological Survey (USGS) Location Map
- Appendix B- Map of City of Kingston Sanitary Sewer System in Vicinity of Project

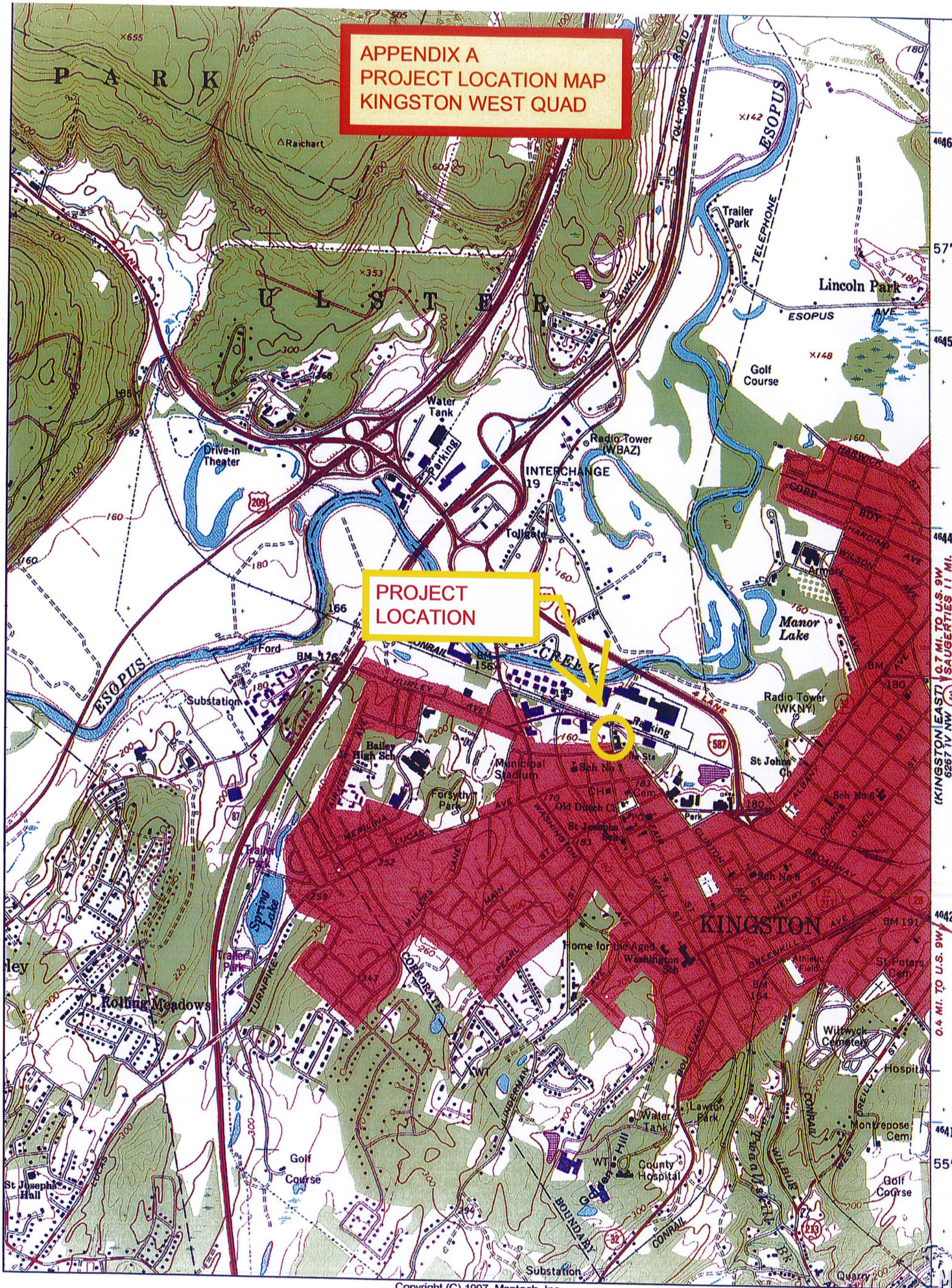
**KINGSTONIAN PROJECT: PRELIMINARY REPORT ON WATER SUPPLY &
WASTEWATER CAPACITY**

Appendix A

United States Geological Survey (USGS) Location Map

APPENDIX A
PROJECT LOCATION MAP
KINGSTON WEST QUAD

PROJECT
LOCATION



Appendix B

Map of City of Kingston Sanitary Sewer System in Vicinity of Project

APPENDIX B
AREA SEWER MAP

Schwenk Drive
Sanitary Sewer

Frog Alley Force
Main to No.
Front St.

No. Front Street
Sanitary Sewer

PROJECT
AREA

