

August 24, 2017

MEMORANDUM

To: Ellen Kost, AICP, Associate Planner

From: Jeffrey S. Burroughs, PE, Town Engineer

Re: Proposed Westwood Development Sanitary Sewer Downstream Capacity Analysis

The Engineering Department has prepared this report relative to the above referenced subject. This report will serve to document the Engineering Department's determination of available downstream sanitary sewer capacity for the proposed Westwood development and other future projects proposed for the Maple Road/Millersport Highway corridor.

This report ultimately finds that there is an existing unavoidable capacity bottleneck within the downstream sanitary sewers that would service the Westwood project. The downstream capacity to service the Westwood project and other projects within that sewer shed are ultimately limited to the capacity within the Sweet Home Road Interceptor and the detail provided within this report discusses our recommendation for how a limited flow allocation could be provided towards the Westwood project of no more than 0.34 MGD (million gallons per day) peak flow.

Background

There are significant sewer capacity constraints in the above referenced system corridor as depicted in the attached downstream sewer map (Exhibit A) and described in the following:

- The 54 inch West Side Interceptor at Sheridan Drive and the I290 has a capacity of 36.5 MGD. Peak wet weather flow in this pipe is currently at 38.75 MGD. The sewer shed of this interceptor contains Snyder, portions of Eggertsville and the Village of Williamsville. The alignment of the 54 inch West Side Interceptor is parallel to the I290 until the I990 interchange where it transitions to a northerly alignment.
- The 48 inch Hartford Road (West Side) Interceptor just upstream of its terminus with the 54 inch West Side Interceptor has a capacity of 24.6 MGD. Peak wet weather flow in this pipe is currently at 21.50 MGD. The sewer shed of this interceptor is primarily Eggertsville and the Bailey/Hartford area.
- The 54 inch West Side Interceptor just downstream of the above referenced junction point has a capacity of 38.5 MGD. Peak wet weather flow in this pipe is currently at 60.95 MGD.

- The 54 inch West Side Interceptor transitions from a 54 inch to 60 inch pipe at Chestnut Ridge Road. The 60 inch interceptor's alignment is due north and then jogs west and then north and runs under Ellicott Creek until its terminus with the Peanut Line Interceptor. The capacity of the 60 inch interceptor is 49.1 MGD and has a peak wet weather flow of 59.80 MGD. The sewer shed of this 60 inch pipe consists of all of the above areas including the NFB corridor and Willowridge area.

Given the above flows (and system Sanitary Sewer Overflows (SSOs)), the Engineering Department has concentrated its historical replacement and rehab program on the collector sewers in Eggertsville and Snyder. Also, in an effort to relieve surcharge conditions in the West Side Interceptor, a project was constructed in 2016 to divert wet weather flow from the 60 inch West side Interceptor to the Sweet Home Road Interceptor via an existing dead ended 24 inch sewer on Chestnut Ridge Road. The project consists of a 21 inch pipe overflow set at the crown elevation of the 60 inch West Side Interceptor. The flow through the diversion can be modified by the end of pipe gate valve that is currently full open. The design flow of the diversion was calculated to be approximately 5.0 MGD; however the flow allowed through the diversion is variable based on the surcharge level in the 60 inch interceptor and the position of the gate valve. The diverted sewage flows to the Sweet Home Road Interceptor.

History

Relative to the Westwood Development, the Engineering Department has reviewed and commented on sewer capacity issues multiple times. Following multiple conversations with the Petitioner and their consultants regarding a lack of sewer capacity in the West Side Interceptor, the Petitioner, in their November 2016 submittal, still proposed sewage routing to the Sheridan Drive collector sewer and the West Side Interceptor.

After reaching an impasse with the above referenced routing, the petitioner proposed two alternative sewer routings to service the development. One of the proposals routes sewage from the development to the Amherst Manor sewer and through the Augsperger Road sewer on the State University at Buffalo North Campus (SUNYAB) to Sweet Home Road. The other proposed route bypasses SUNYAB entirely and pumps the sewage to Sweet Home Road. Both alternatives end up at the same point in the sanitary sewer system – the 36 inch Sweet Home Road Interceptor.

Given the above, the Engineering Department has spent significant time and effort evaluating the sewer corridor between the proposed development referenced above and the Sweet Home Road Interceptor (the Maple Road-Amherst Manor Drive-Augsperger Drive-Sweet Home Road sanitary sewers). To aid in the review of the Engineering Department's findings, the department has attached an exhibit (Exhibit B) showing the location of the monitoring nodes with respect to the town's sanitary sewer interceptors.

Findings

Flow meters were deployed in the above referenced corridor during the periods of November-December 2016, February-March 2017 and May-July 2017. The primary reason for the extensive flow metering was to ensure that the Town understood the effects of the proposed development on the system and also the effects of the new diversion structure on the Sweet Home Road Interceptor.

It is important to note that the Town has also recently deployed flow meters in the Augsperger Drive sewer on the SUNYAB campus to determine if there are flow limiting conditions in that sewer. Those flow meters will remain until mid-October 2017.

The flow monitoring has determined the following peak wastewater flows in the existing system:

Node (Exhibit A)	Sewer Size and Material of Construction	Peak Wet Weather Flow (MGD)	Pipe Capacity (MGD)	Notes
1 (Amherst Manor sewer)	15 inch VTP	1.64	1.70	December 1, 2016 flow monitoring
2 (SUNYAB outfall)	30 inch RCP	3.41 (May 25, 2017 peak flow 3.21)	Varies	December 1, 2016 flow monitoring
3 (Chestnut Ridge diversion sewer)	24 inch VTP	5.6	5.0 (design capacity)	May 25, 2017 flow monitoring
4 (Sweet Home Road Interceptor)	36 inch RCP	9.0	9.64	May 25, 2017 flow monitoring.

In reviewing the above referenced table and information, it is important to note the following:

- The peak flows that were captured on December 1, 2016 correspond to a 0.34 inch rain event, which followed after a 0.83 inch rain event on November 30, 2016. However, during this event, there was no data captured for Node 3.
- The peak flows that were captured on May 25, 2017 correspond to a 1.68 inch rain event (a 2 year 6 hour event).
- SUNYAB was not in session on May 25, 2017. (For purposes of this analysis, the Department estimates that in-session flows from SUNYAB are an incremental 0.20 MGD)

The Engineering Department chose two different dates to illustrate the flow variations in the sewer corridor because the May 25, 2017 date does not capture SUNYAB in session; however the May 25, 2017 date was the only date where the Chestnut Ridge Diversion Sewer (Node 3) and the Sweet Home Road Interceptor (Node 4) flows were captured simultaneously.

Given that the above monitoring in Node 4 did not include 0.20 MGD of sewage flow from SUNYAB, it can be conservatively assumed that if SUNYAB had been in session, the flow in Node 4 may have been approximately 9.20 MGD, leaving 0.44 MGD capacity.

Future Demand

Future proposed peak flows (incremental) for the corridor are as follows

+0.95 MGD	Proposed Westwood development
+0.10 MGD	Proposed town projects (hotel and ice arena expansion)
+0.365 MGD	Prior proposed gun club development
<u>+???</u>	<u>Future SUNYAB projects</u>
>>1.415 MGD	Future proposed incremental peak flows

Available Capacity

In light of the above, it is clear that there is not adequate capacity in the Amherst Manor sewer and Sweet Home Road Interceptor to serve the Westwood project as currently proposed.

Given the above, the Engineering Department recommends that the Chestnut Ridge Diversion structure discharge be reduced by 0.6 MGD to match the design discharge goals to the Sweet Home Road Interceptor. This modification will increase the sewer capacity as follows:

+0.44 MGD	Remaining Sweet Home Road Interceptor Capacity (including 0.20 MGD flow contribution from SUNYAB)
<u>+0.60 MGD</u>	<u>Reduction in Chestnut Ridge Diversion flow (from Chestnut Ridge Diversion adjustment)</u>
1.04 MGD	Total Available Capacity

Allocation

The Engineering Department is recommending the following flow allocation:

+0.34 MGD	TOA Reserved Flow
+0.34 MGD	SUNYAB Reserved Flow
<u>+0.34 MGD</u>	<u>Westwood Flow Allocation</u>
1.02 MGD	Total Reserved Flow

The above recommendation includes equal allocation to future town projects (including future development in the corridor), to Westwood and to SUNYAB.

Future Downstream Sewer Capacity Analysis

Node (Exhibit A)	Existing Peak Flow (MGD)	Total Allocation (MGD)	Proposed Peak Flow (MGD)	Future Capacity (MGD)	Notes
1 (Amherst Manor sewer)	1.64	0.68	2.32	2.55	Increase to 18 inch
2 (SUNYAB outfall)	3.41	1.02	4.43	Varies	
3 (Chestnut Ridge diversion sewer)	5.60		5.0		Decrease diversion flow to 5.0 MGD
4 (Sweet Home Road Interceptor)	9.20	1.02	9.62	9.64	Existing peak flow would be 8.60 MGD with decrease in diversion flow

As part of our analysis the department rejects the petitioner's proposal to pump sewage around SUNYAB; therefore the department is recommending that the petitioner increase the size of the Amherst Manor sewer.

Conclusion

The department finds an equal allocation of the available capacity an appropriate approach to managing proposed and future sewer flows. This limits the available capacity for the Westwood project to 0.34 MGD.

Attachments

C: Barry Weinstein, M.D., Town Supervisor
Stanley Sliwa, Town Attorney



Town of Amherst Engineering Department
Sewer Maintenance Division

Main Sanitary Sewer Interceptors
DOWNSTREAM SEWER

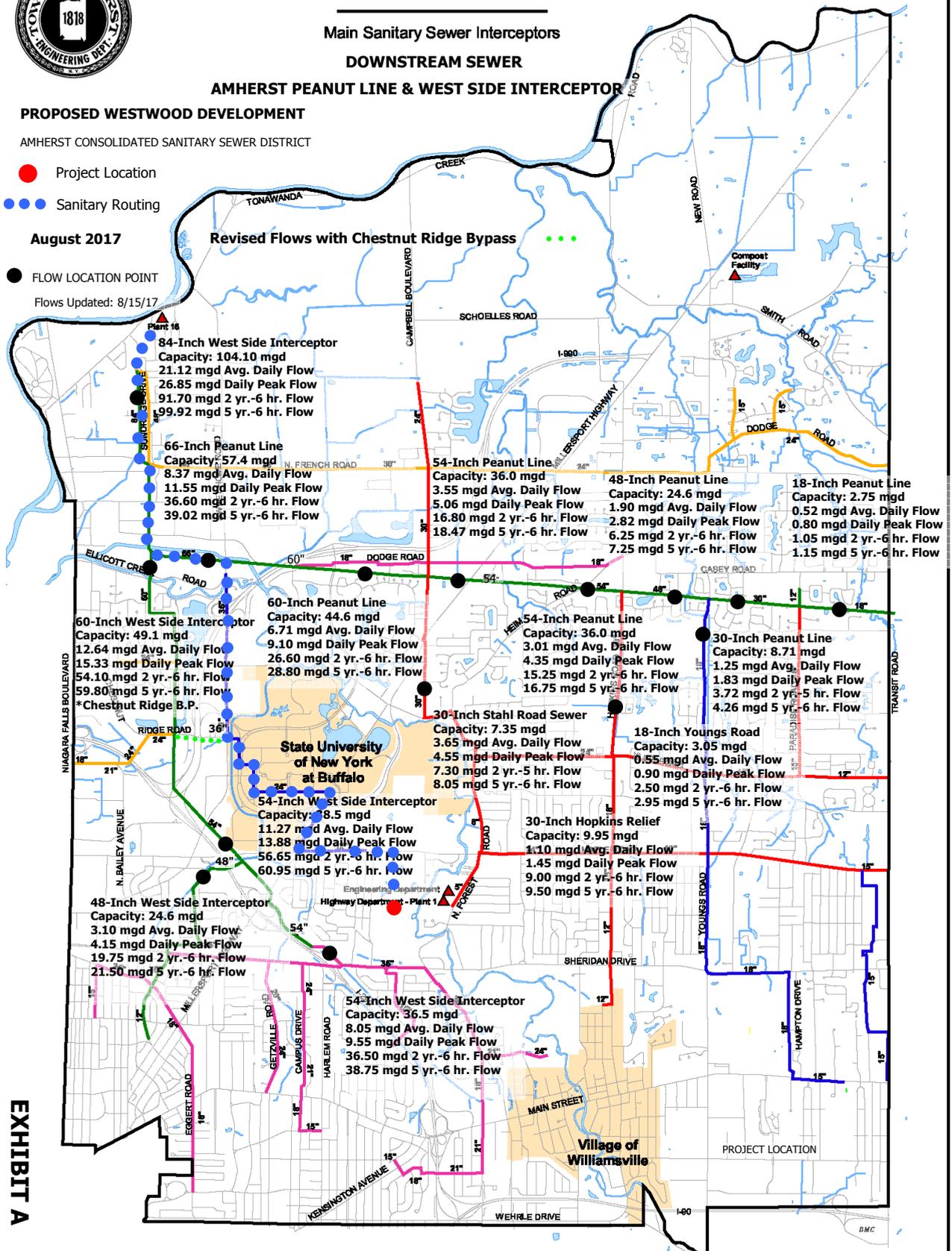
AMHERST PEANUT LINE & WEST SIDE INTERCEPTOR

PROPOSED WESTWOOD DEVELOPMENT

AMHERST CONSOLIDATED SANITARY SEWER DISTRICT

- Project Location
 - Sanitary Routing
 - August 2017**
 - FLOW LOCATION POINT
- Flows Updated: 8/15/17

Revised Flows with Chestnut Ridge Bypass



84-Inch West Side Interceptor
Capacity: 104.10 mgd
21.12 mgd Avg. Daily Flow
26.85 mgd Daily Peak Flow
91.70 mgd 2 yr.-6 hr. Flow
99.92 mgd 5 yr.-6 hr. Flow

66-Inch Peanut Line
Capacity: 57.4 mgd
8.37 mgd Avg. Daily Flow
11.55 mgd Daily Peak Flow
36.60 mgd 2 yr.-6 hr. Flow
39.02 mgd 5 yr.-6 hr. Flow

60-Inch West Side Interceptor
Capacity: 49.1 mgd
12.64 mgd Avg. Daily Flow
15.33 mgd Daily Peak Flow
54.10 mgd 2 yr.-6 hr. Flow
59.80 mgd 5 yr.-6 hr. Flow
*Chestnut Ridge B.P.

48-Inch West Side Interceptor
Capacity: 24.6 mgd
3.10 mgd Avg. Daily Flow
4.15 mgd Daily Peak Flow
19.75 mgd 2 yr.-6 hr. Flow
21.50 mgd 5 yr.-6 hr. Flow

54-Inch West Side Interceptor
Capacity: 36.5 mgd
8.05 mgd Avg. Daily Flow
9.55 mgd Daily Peak Flow
36.50 mgd 2 yr.-6 hr. Flow
38.75 mgd 5 yr.-6 hr. Flow

60-Inch Peanut Line
Capacity: 44.6 mgd
6.71 mgd Avg. Daily Flow
9.10 mgd Daily Peak Flow
26.60 mgd 2 yr.-6 hr. Flow
28.80 mgd 5 yr.-6 hr. Flow

54-Inch West Side Interceptor
Capacity: 38.5 mgd
11.27 mgd Avg. Daily Flow
13.88 mgd Daily Peak Flow
56.65 mgd 2 yr.-6 hr. Flow
60.95 mgd 5 yr.-6 hr. Flow

30-Inch Stahl Road Sewer
Capacity: 7.35 mgd
3.65 mgd Avg. Daily Flow
4.55 mgd Daily Peak Flow
7.30 mgd 2 yr.-5 hr. Flow
8.05 mgd 5 yr.-6 hr. Flow

30-Inch Hopkins Relief
Capacity: 9.95 mgd
1.10 mgd Avg. Daily Flow
1.45 mgd Daily Peak Flow
9.00 mgd 2 yr.-6 hr. Flow
9.50 mgd 5 yr.-6 hr. Flow

54-Inch Peanut Line
Capacity: 36.0 mgd
3.55 mgd Avg. Daily Flow
5.06 mgd Daily Peak Flow
16.80 mgd 2 yr.-6 hr. Flow
18.47 mgd 5 yr.-6 hr. Flow

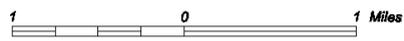
48-Inch Peanut Line
Capacity: 24.6 mgd
1.90 mgd Avg. Daily Flow
2.82 mgd Daily Peak Flow
6.25 mgd 2 yr.-6 hr. Flow
7.25 mgd 5 yr.-6 hr. Flow

18-Inch Peanut Line
Capacity: 2.75 mgd
0.52 mgd Avg. Daily Flow
0.80 mgd Daily Peak Flow
1.05 mgd 2 yr.-6 hr. Flow
1.15 mgd 5 yr.-6 hr. Flow

18-Inch Youngs Road
Capacity: 3.05 mgd
0.55 mgd Avg. Daily Flow
0.90 mgd Daily Peak Flow
2.50 mgd 2 yr.-6 hr. Flow
2.95 mgd 5 yr.-6 hr. Flow

30-Inch Peanut Line
Capacity: 8.71 mgd
1.25 mgd Avg. Daily Flow
1.83 mgd Daily Peak Flow
3.72 mgd 2 yr.-5 hr. Flow
4.26 mgd 5 yr.-6 hr. Flow

EXHIBIT A





Town of Amherst Engineering Department
Sewer Maintenance Division

**Main Sanitary Sewer Interceptors
DOWNSTREAM SEWER MONITORING LOCATIONS
PROPOSED WESTWOOD DEVELOPMENT**

AMHERST CONSOLIDATED SANITARY SEWER DISTRICT

- Project Location
- Sanitary Routing
- August 2017**
- FLOW LOCATION POINT
- Flows Updated: 8/15/17

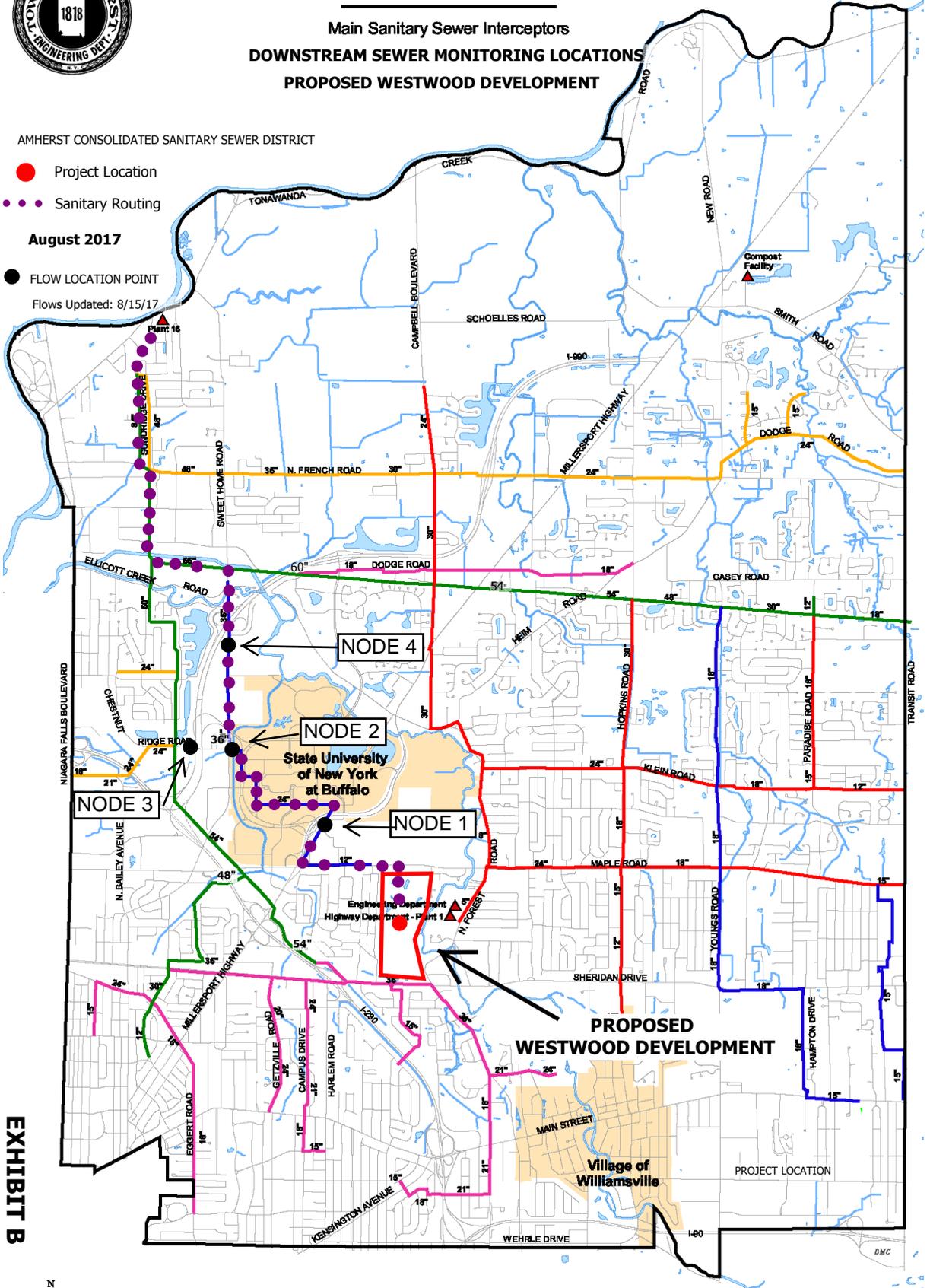


EXHIBIT B

