

# Sewer System Evaluation Survey (SSES)

## Work Plan

Town of Yorktown, New York

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**October 29, 2020**

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## 1.0 EXECUTIVE SUMMARY

The Town of Yorktown is located in Westchester County, New York (refer to Figure 1 for a project location map). The Town owns a New York State Department of Environmental Conservation (NYSDEC) permitted wastewater treatment plant (WWTP) which serves residential and commercial customers within the Town (SPDES Permit No. NY0026743). The WWTP and wastewater collection system infrastructure includes 16 pump stations, 3,462 manholes, and approximately 124 miles of sanitary sewer collection pipes owned and operated by the Town.

The collection system is separated into the Peekskill Sewer District and Hallocks Mill Sewer District as shown in Figure 2. The Hallocks Mill Sewer District collection system is located within the New York City drinking water supply watershed and is comprised of approximately 1,712 manholes, 335,000 linear-feet of gravity sewer, and 11,500 linear-feet of force main which discharges to the Hallocks Mill (Town of Yorktown) WWTP. The Peekskill Sewer District collection system is located within the both the New York City watershed and Westchester County Sewer District and is comprised of approximately 320,000 linear-feet of gravity sewer, 1,750 manholes, and 30,000 linear-feet of force main which discharges to the Westchester County owned Peekskill WWTP.

Based on historical records, sewer overflows (SSO's) have occurred within the Peekskill Sewer District collection system. Few occurred as a result of blockages typical of many collection systems and most have occurred as a result of a broken force main. The SSO's have occurred primarily in the Hill/Lee Boulevard sewers and the area immediately adjacent, including the Farmwalk Pump Station Force main. Town operations staff have indicated that most of the SSO's resulting from a broken force main have occurred in the Farmwalk force main which is constructed of 2-inch PVC. The majority of the SSO's are a result of blockages that have occurred within the gravity sewers in the Hill/Lee Boulevard (Subbasins 9 and 10). These subbasins generally have a greater number of commercial discharges and the sewers have a shallow pitch.

As a result of overflows within the collection system, the Town of Yorktown and EDR recently negotiated an Order on Consent (NYSDEC Case No. R3-20180912-159 dated May 15, 2019) with the NYSDEC to address inflow and infiltration within the Peekskill Sewer District collection system maintained by the Town of Yorktown. The Town recently completed an Infiltration and Inflow Flow Study which was submitted to the NYSDEC on August 31, 2020. As outlined in the Consent Order, the Town is to conduct a Sewer System Evaluation Survey Work Plan (Work Plan) for the Peekskill Sewer District collection system by October 30, 2020.

The purpose of this Work Plan is to outline the areas for further investigation as identified in the Inflow and Infiltration Flow Study, identify the investigation methods (CCTV inspection, smoke/dye testing, etc.), and outline the schedule for implementation.

As outlined in the Infiltration and Inflow Flow Study, flow monitoring was conducted at 12 locations by ADS Environmental Services (ADS) between May 13 and July 26, 2020. Based on the analysis of data collected during the flow metering program, the following results were noted:

1. Based on the results of the Inflow and Infiltration Flow Study, Subbasins 8 and 11 should be further investigated through a Sewer System Evaluation Survey.

In summary, recommendations for next steps to better identify the causes inflow and infiltration are as follows:

1. Conduct cleaning and close circuit tv inspection (CCTV) in Subbasins 8 and 11.
2. Utilize the CCTV video to identify potential illicit and sump pump connections.
3. Based on the results of cleaning and CCTV inspections, perform smoke and/or dye testing of areas to identify inflow sources that could not be verified by the CCTV inspections within Subbasins 8 and 11 if needed. Flow isolation will be utilized where pertinent and applicable.

## **2.0 BACKGROUND AND HISTORY**

### **2.1 Location**

The Town of Yorktown is located in Westchester County, New York (refer to Figure 1 for a project location map). The Town owns a NYSDEC permitted WWTP which serves residential and commercial customers within the Town (SPDES Permit No. NY0026743). The WWTP and wastewater collection system infrastructure includes 16 pump stations, 3,462 manholes, and approximately 124 miles of sanitary sewer collection pipes owned and operated by the Town. The Peekskill Sewer District is comprised of approximately 320,000 linear-feet of gravity sewer, 1,750 manholes, and 30,000 linear-feet of force main which discharges to Westchester County owned Peekskill WWTP.

The Peekskill sewage collection system is comprised of approximately 320,000 linear-feet of collection system piping that could be divided into 12 individual “basins”. Pipe sizes in the system range from 6-inch to 36-inch. Age of the collection system piping varies. Flow from each of the basins is collected together into a 36-inch (owned by Westchester



County) pipe which discharges to the Peekskill WWTP. Figure 3 provides an overview of the Peekskill Sewer District owned and operated by the Town of Yorktown, and Figures 4 and 5 show Basins 8 and 11 within the collection system.

Basins 8 and 11 are comprised of approximately 23,516 and 23,024 linear-feet of collection system piping as well as 122 and 133 manholes, respectively. The predominant land use within the basin are residential; however, it is noted that Basin 11 contains the Yorktown Rehabilitation and Nursing Center as well as the Yorktown Assisted Living Residents, both of which are significant contributors of flow into the collection system.

### **3.0 COLLECTION SYSTEM ASSESSMENT**

Assessment of the Peekskill Collection System will follow USEPA guidance and engineering practices. The assessment will be conducted in two phases. Phase 1 will include cleaning and CCTV inspection and Phase 2 will include smoke and dye testing based on the results observed during the Phase 1 inspections.

#### **3.1 Phase 1 - Closed-Circuit Television Inspection (CCTV)**

The primary assessment tool used will be CCTV inspection. CCTV inspections will follow National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification (PACP) guidelines and rating procedures. NASSCO, along with the assistance of the Water Research Centre (WRC), has developed a national certification program to standardize the identification, categorization, evaluation, and prioritization of sanitary sewer or storm sewer infrastructure through CCTV investigations. This standardized certification program is used to provide consistent recordkeeping when compiling CCTV reports into a common database which can then be used for operation and maintenance (O&M) activities, as well as pipe rehabilitation and replacement.

NASSCO PACP standards will be used to conduct CCTV investigations and document findings. The PACP defect descriptions are organized into the following general categories:

1. Pipe Condition Coding - This group includes the type of defects where the pipe is considered to be damaged, ranging from a minor case defect to a more severe case, depicted as pipe failure. The coding group includes defects described as: cracks, fractures, broken pipe, holes, deformities, collapsed pipe, joint defects, surface damage defects, weld failures, point repair codes, brickwork defects, and lining failures.

2. Operation and Maintenance Coding - This group includes the various codes that involve the spectrum of defects that may impede the operation and maintenance of the sewer piping system. The Operation and Maintenance Coding group includes defects comprised of roots, infiltration, deposits and encrustations, obstacles/obstructions, and vermin.
3. Construction Features Coding - This group includes the various codes associated with the typical construction of the sewer piping system. The Construction Features Coding group includes taps, intruding seal material, pipe alignment codes, and access points.
4. Miscellaneous Features Coding - This group includes observation codes such as water levels (detection of sags), pipe material changes, and dye testing notes.

Table 3-1 below describes the grading system for pipe condition and O&M defects, and general guidelines regarding deterioration rates. Each defect is be scored with a grade ranging from 1 to 5, where grade 5 has the most potential for pipe failure.

**Table 3-1. Pipe Condition and O&M Defects Grading**

<b>Grade</b>	<b>Description</b>	<b>Grade Definition</b>
5	Immediate Attention	Defects requiring immediate attention
4	Poor	Severe defects that will become Grade 5 defects in the near future
3	Fair	Moderate defects that will continue to deteriorate
2	Good	Defects that have not begun to deteriorate
1	Excellent	Minor defects

CCTV inspections will assess the physical and operating condition of the collection system using NASSCO standards to identify degradation that may contribute to high inflow and infiltration, and sanitary sewer overflows within the collection system. CCTV inspections will also confirm pipe attributes and other system information in the Peekskill Collection System (Basins 8 and 11) including:

1. Location, size and configuration of sewers and manholes.
2. Locations of suspected cross connections between the sanitary sewer system and the Town's MS4.
3. Locations of potential illicit discharges and sump connections.

## **3.2 Phase 2 - Smoke and Dye Testing**

Smoke testing and/or dye testing may be conducted only in very limited areas to complement CCTV inspection work in order to identify and pinpoint the location of possible I/I sources. Smoke testing and/or dye testing are economical and quick methods for identifying the location of inflow sources, such as damage in sewer pipes or manholes, or cross connections including, but not limited to, roof leaders, foundation drains, yard drains, storm sewers, and undocumented/illicit connections.

### **3.2.1 Smoke Testing**

Limited smoke testing will be conducted as part of the phased field investigations to help determine which gravity sewer system components may require additional assessment through limited and/or comprehensive dyed water testing.

Smoke testing will be conducted during periods of dry weather with low groundwater and with at least 24 hours having elapsed from the previous rain event. Smoke testing will not be performed during or following weather conditions that may impair the detection of escaping smoke, when groundwater is high or the ground is frozen, or on days of high winds, rain, snow, or fog. Smoke testing will be conducted on a limited basis in Basins 8 and 11 based on the CCTV inspection results.

### **3.2.2 Dye Testing**

Dye testing will be conducted as part of the phased field investigation approach to complement smoke testing where applicable for verifying direction of flow, sources of I/I, and the presence of illicit connections to the collection system. Dye testing is used to confirm sewer system connectivity that cannot be confirmed through smoke testing or CCTV inspection activities. Dye testing will be performed in conjunction with CCTV inspection on a limited basis in Basins 8 and 11 based on the CCTV inspection results.

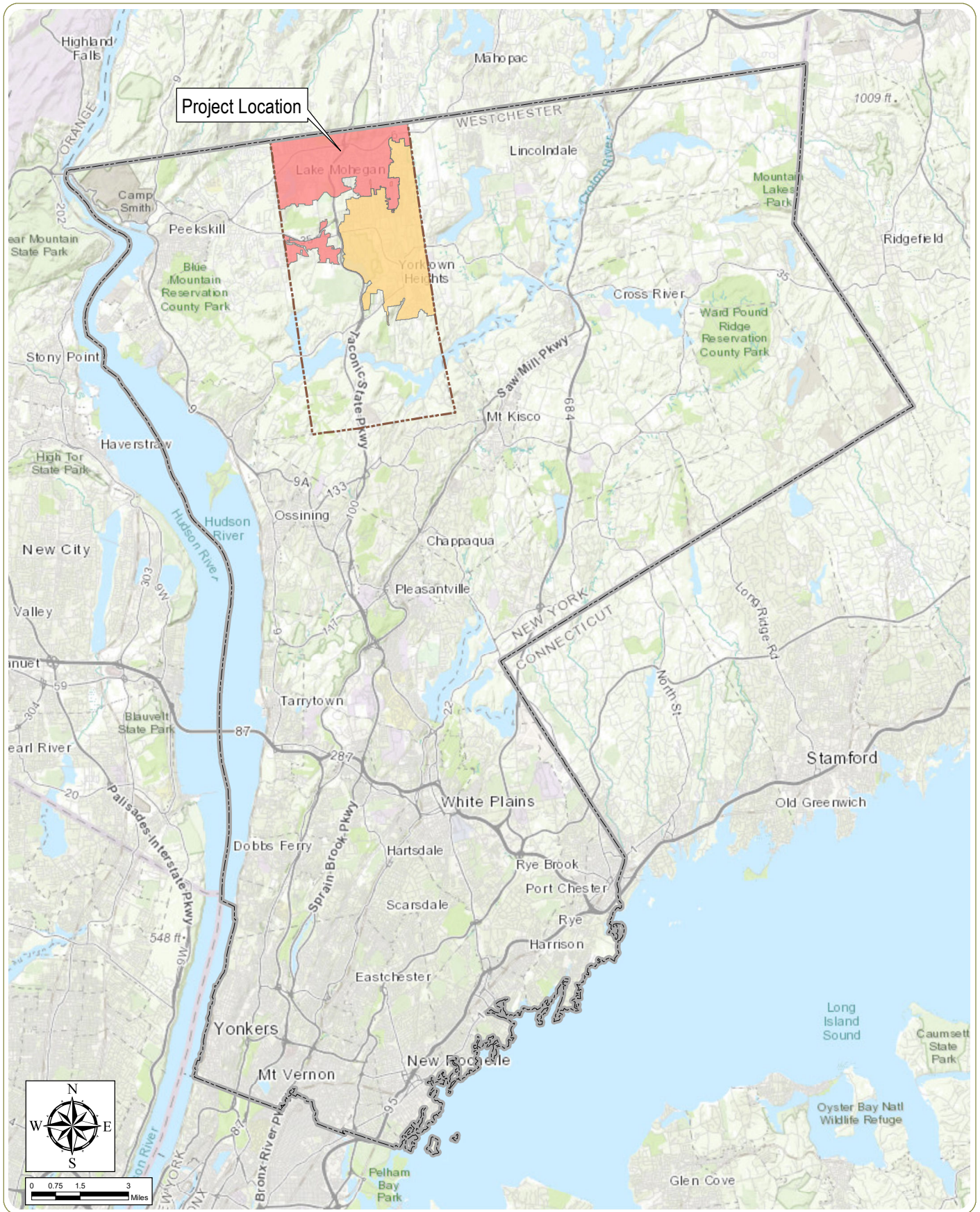
## **4.0 ASSESSMENT REPORT**

The Town of Yorktown proposes to conduct field investigations (Phase 1 and 2) and submit a summary report which summarizes the Work Plan task status within 18 months of the approved Work Plan in accordance with the Order on Consent. The report will identify areas of the Peekskill Collection System within Basins 8 and 11, evaluate collected field data, provide recommendations for repair/replacement, and include an implementation schedule and estimated capital cost.

## 5.0 IMPLEMENTATION SCHEDULE

The Town of Yorktown anticipates the following schedule for implementation of the Work Plan based on a NYSDEC approval of the Work Plan by November 30, 2020:

- Phase 1 Field Investigations November 30, 2020 – September 20, 2021
- Phase 2 Field Investigations (if required) September 21, 2021 – December 21, 2021
- Assessment Report December 22, 2021 – May 30, 2022
- Submission to NYSDEC May 30, 2022 (18 months after approved Work Plan)



## Yorktown SSES Work Plan

Town of Yorktown, Westchester County, New York

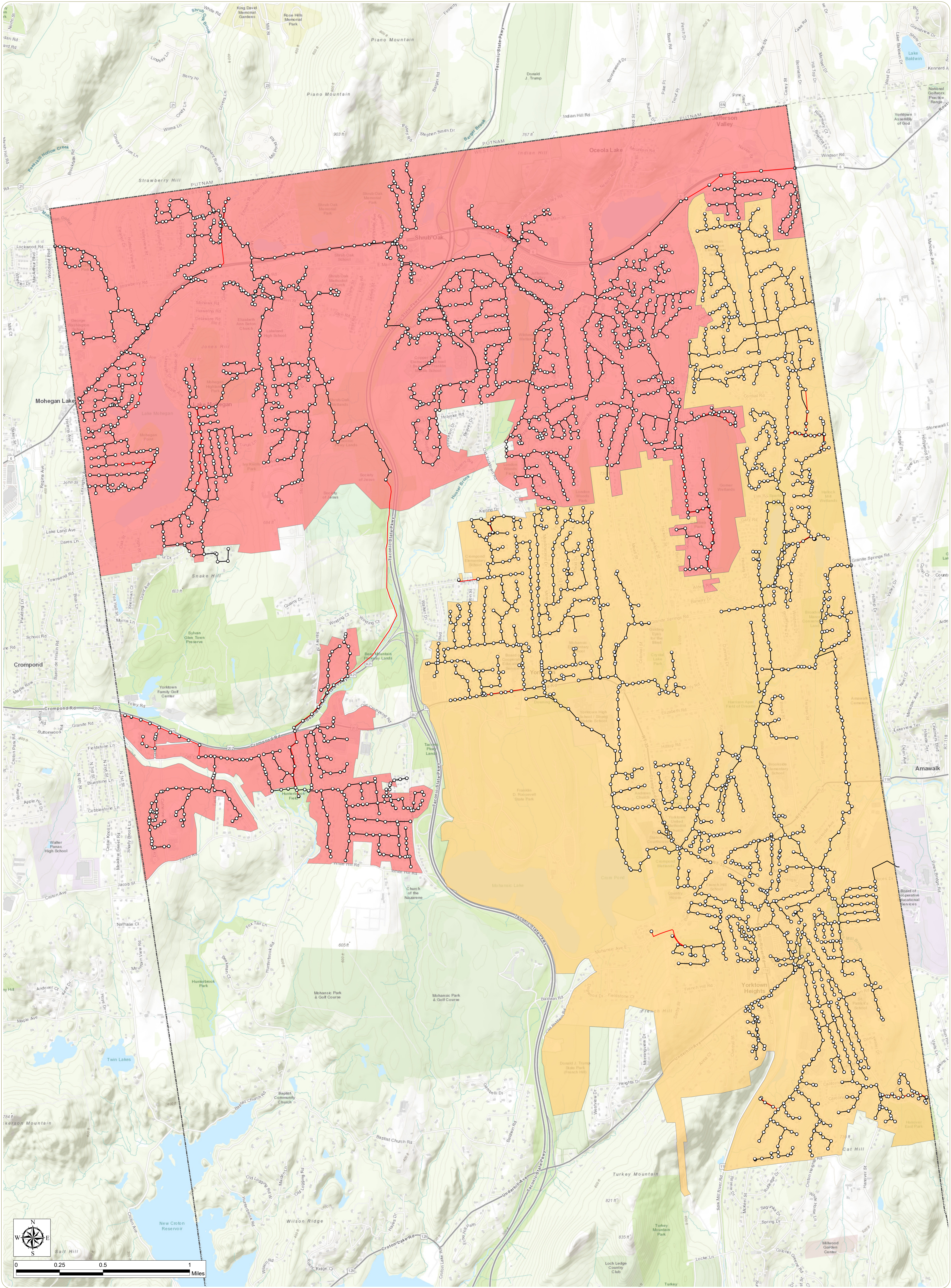
**Figure 1: Location Map**

**Notes:** 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on October 15, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Peekskill Sewer District
- Hallocks Mill Sewer District
- Town of Yorktown
- Westchester County







# Yorktown SSES Work Plan

Town of Yorktown, Westchester County, New York

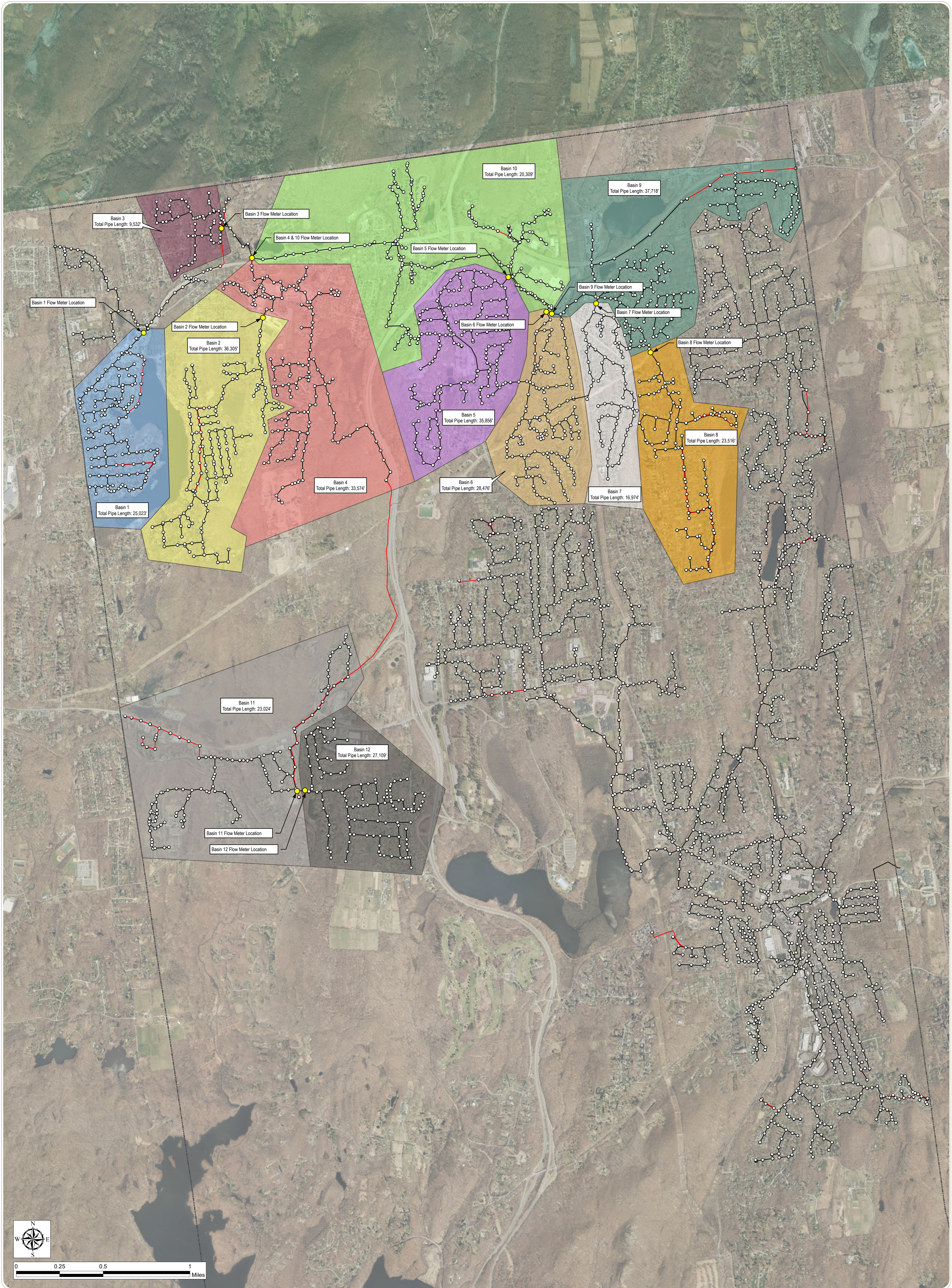
**Figure 2: Sewer Collection System Map**

- Manhole
- Sewer Force Main
- Sewer Main
- ▭ Town of Yorktown
- ▭ Peekskill Sewer District
- ▭ Hallocks Mill Sewer District

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## Yorktown SSES Work Plan

Town of Yorktown, Westchester County, New York

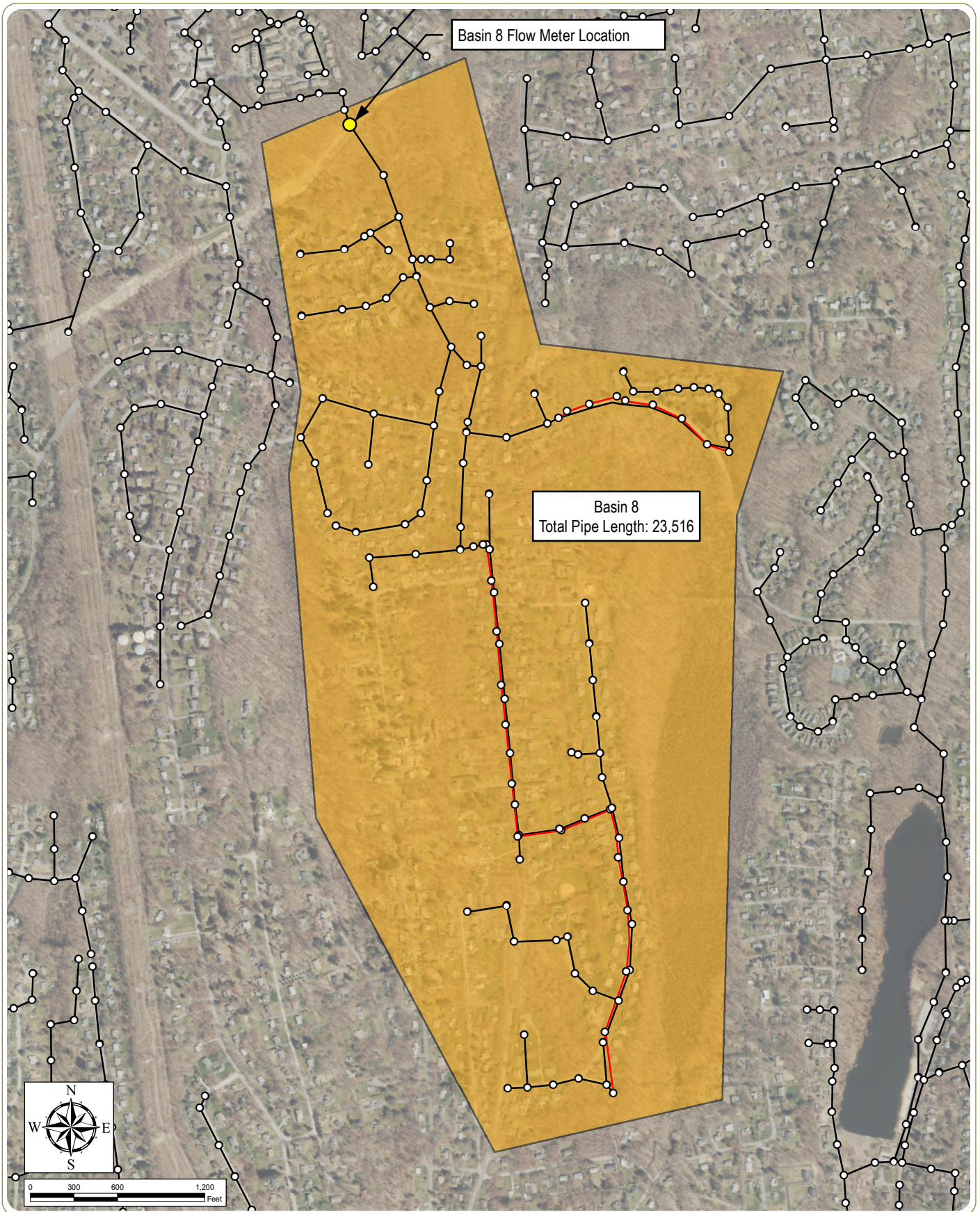
Figure 3: Peekskill Sewer District - Basin Location Map

- Flow Meter
- Manhole
- Sewer Force Main
- Sewer Main
- Town of Yorktown

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### Yorktown SSES Work Plan

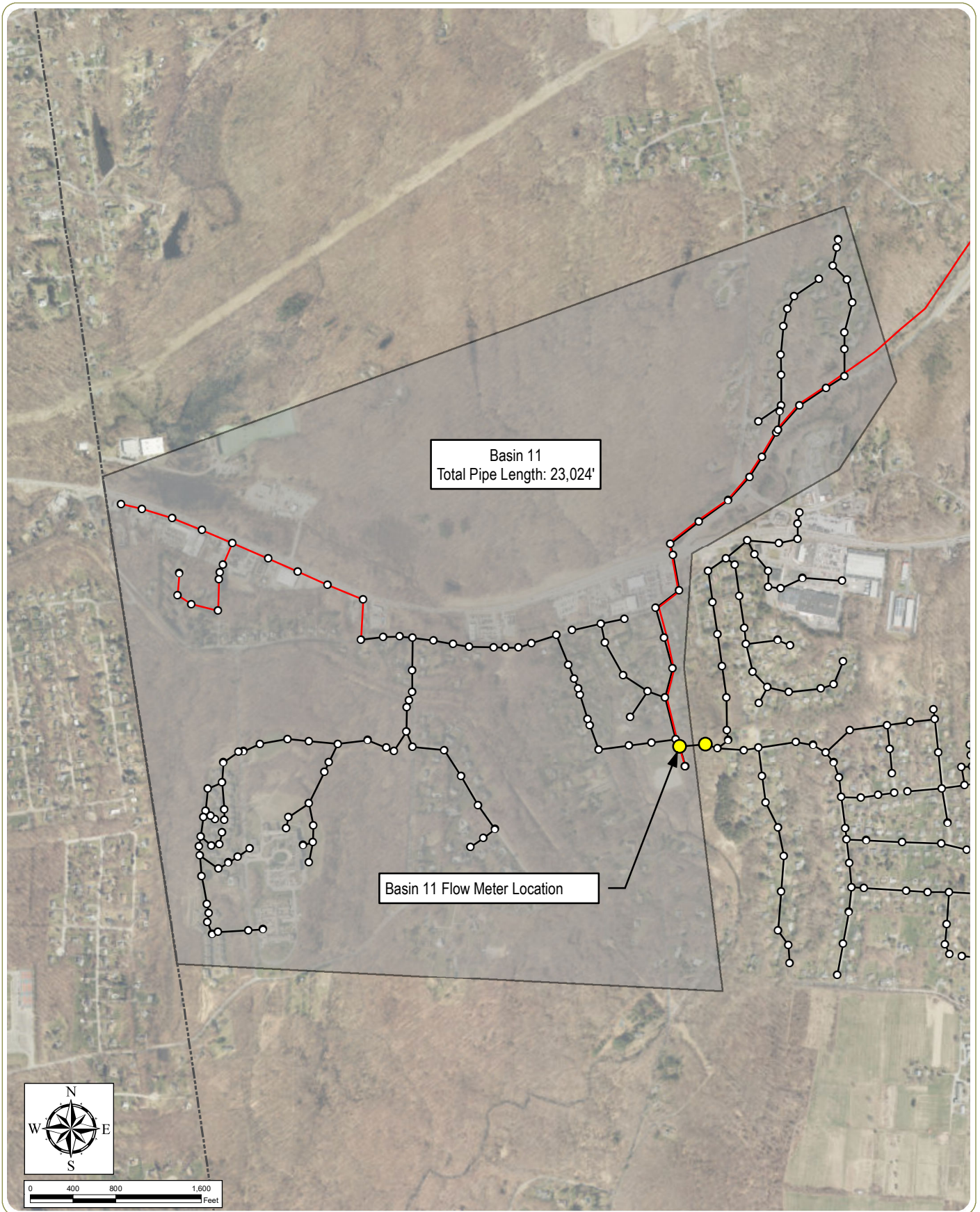
Town of Yorktown, Westchester County, New York

**Figure 4: Basin 8**

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- Flow Meter
- Basin 8
- Manhole
- Town of Yorktown
- Sewer Force Main
- Sewer Main





### Yorktown SSES Work Plan

Town of Yorktown, Westchester County, New York

**Figure 5: Basin 11**

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- Flow Meter
- Manhole
- Sewer Force Main
- Sewer Main
- Basin 11
- Town of Yorktown