



Hallsdale-Powell Utility District
Capacity, Management, Operation & Maintenance
(CMOM) Program
2016 Annual Report



TABLE OF CONTENTS

SECTION 1.0 - 2016 CMOM PROGRAM SUMMARY

- A. Certification Statement
- B. Purpose and Scope
- C. Overview of HPUD Infrastructure
- D. Roles and Responsibilities for CMOM Program
- E. CMOM Program Summary
 - 1. Management Plan
 - 2. Performance and Management Review
 - 3. Data and Asset Management
 - 4. Capital Improvements Plan (CIP)
 - 5. Sewer Overflow Response Plan (SORP)
 - 6. Fats, Oil & Grease (FOG) Program
 - 7. System Evaluation and Capacity Assurance Plan
 - 8. Communication Plan

SECTION 2.0 - COMPLETED, ONGOING & PLANNED INFRASTRUCTURE PROJECTS

- A. Completed and Ongoing Collection System Projects FY 2016
 - 1. Preventative Maintenance & Inspection (PMI) Program
 - a. 2016 PMI – Remainder of the Sanitary Sewer System
 - b. 2016 PMI – HP06 & HP08
 - 2. Flow Monitoring
 - a. Long Term/ Permanent Flow Monitoring
 - b. Temporary Flow Monitoring – HP08 & HP09
 - 3. Dry Gap Pike Sanitary Sewer Overflow Tank
 - 4. Beaver Creek Interceptor Replacement- Easement Acquisition
- B. Completed, Ongoing and Planned Wastewater Treatment Plant Projects
- C. Completed, Ongoing and Planned Pump Station Projects

SECTION 3.0 - SUMMARY OF EDUCATION AND OUTREACH ACTIVITIES

SECTION 4.0 - CHANGES TO CMOM PROGRAM AND CAPACITY ASSURANCE PLAN

- A. Engineering Support and Management
- B. Financial Management

SECTION 5.0 - OVERVIEW OF FIVE-YEAR CAPITAL IMPROVEMENTS PLAN (CIP)

SECTION 6.0 - SUMMARY OF CMOM PROGRAM IMPLEMENTATION

SECTION 7.0 – SUMMARY OF EFFECTIVENESS OF CMOM PROGRAM

TABLE OF CONTENTS - APPENDICES

Attachment 1:	Spreadsheet - Performance Measures
Attachment 2:	Spreadsheet - Sewer Capital Improvements Plan (CIP)
Attachment 3:	Map - 2016 SSO Locations
Attachment 4:	Map - Annual PMI Inspections - 2006 - 2016
Attachment 5:	Map - PMI - 2016 CCTV Inspections
Attachment 6:	Map - 2016 – PMI Manhole Inspections

SECTION 1.0 - 2016 CMOM PROGRAM SUMMARY

SECTION 1.0 - 2016 CMOM PROGRAM SUMMARY

A. Certification Statement

This 2016 Annual Report is submitted to fulfill the requirements of Hallsdale-Powell Utility District's (HPUD's) Consent Order #WPC-14-0044 as agreed upon in August 2014. This Consent Order is a legal agreement between the Tennessee Department of Environment & Conservation (TDEC) and HPUD. The purpose of the Consent Order is to address sanitary sewer overflows (SSOs) in the HPUD sanitary sewer system in an effort to improve water quality throughout HPUD service area. In accordance with the 2014 Consent Order, this report details the results of activities undertaken during the annual reporting period beginning January 1, 2016 and ending December 31, 2016.

The format of this report will follow the outline presented within the table of contents and is presented in response to the information requested in the Consent Order. All pertinent and supplemental data, maps and background documentation will be retained on file in the main office located at 3745 Cunningham Drive, Knoxville, Tennessee and is available upon request.


Signature

3-30-2017
Date

B. Purpose and Scope

The CMOM Annual Report provides a summary of CMOM Program activities (past and planned) and is intended to be a communication tool. The report is intended for District staff, regulatory authorities, customers, and the general public. The report serves four general purposes:

- To provide an annual overview of the activities completed under the CMOM Program;
- To describe and document changes to the CMOM Program on an annual basis, which may include changes to objectives, strategies, and performance measures;
- To describe the activities that are planned or currently being undertaken under the CMOM Program;
- To continue compliance with the August 2014 Agreement between the District and the State of Tennessee, Department of Environment and Conservation (TDEC) which requires that HPUD provide an annual report regarding implementation and performance of the CMOM program.

C. Overview of HPUD Infrastructure

HPUD's wastewater system serves approximately 22,992 wastewater customers and covers an area of roughly 147 square miles. The District runs from North Knox County into Union County and extends into portions of Anderson County. The District has more than 1,000 miles of water and sewer mains buried below the 147 square miles of service area. HPUD maintains 20 wastewater pumping stations, 9,526 manholes, and operates a 9.6 million gallon-per-day (MGD) wastewater treatment plant, which uses an advanced membrane bioreactor treatment technology.

HPUD's Wastewater Infrastructure

No. of Sewer Connections	22,992
Service Area	147 square miles
Wastewater Treatment Plants	2
Decentralized Treatment Plants	2
Rated Treatment Plant Capacity	9.6 million gallons per day
Daily Max WWTP Flow	18.5 million gallons per day
Treated Wastewater	2.7 billion gallons per year
Wastewater Lift Stations	20
Sewer Manholes	9,526
Force Main & Gravity Sewer	470 miles

D. Roles and Responsibilities for CMOM Program

HPUD owns and operates the wastewater collection system. The Sewer Collection Department under the direct supervision of the Collection System Superintendent includes a staff of full-time employees who divide their time between operation and maintenance of the sewer collection system. HPUD's Manager of Collection and Distribution Systems also devotes significant time to the management and oversight of the sewer collection system.

Figure 1. Roles and Responsibilities for CMOM Program

Title	Roles & Responsibilities
Board of Commissioners	Elected officials who serve in a policy-making role for the District
General Manager	Reports to HPUD Board of Commissioners and manages all personnel, procurement, budget and overall operation and management of HPUD departments and activities.
Assistant General Manager	Serves as the assistant to the General Manager and has the authority to conduct the same duties/responsibilities as the General Manager, under his direction and approval.
Manager of Environmental Services	Has responsibility of oversight of compliance with environmental regulations and maintaining all regulatory deadlines.
Manager of Collection and Distribution Systems	Provides oversight of the Water Distribution, Sewer Collection System and Construction functions of the District.
Sewer Operations and Maintenance Superintendent	Responsible for oversight of sewer and manhole inspections; sewer cleaning; sewer repairs; and rehabilitation recommendations. Responsible for implementation of the SORP.
Collection Systems Coordinator	Responsible for HPUD Sewer Rehabilitation Program, ACT Now Program Project Oversight, PMI program
Education and Outreach Coordinator	Responsible for education outreach and communication efforts with schools, residents and local businesses.

E. CMOM Program Overview

The CMOM Program provides a method for HPUD to document current activities that are intended to help HPUD achieve goals related to control or elimination of sanitary sewer overflows, improve effluent quality, and ensure adequate system capacity. As part of this effort, HPUD has completed this 2016 annual review of the Program in conjunction with evaluating the performance measures outlined in the Program.

HPUD's CMOM Program includes the following components:

1. Management Plan
2. Performance Measures and Management Review
3. Data and Asset Management
4. Capital Improvements Plan (CIP)
5. Sewer Overflow Response Plan (SORP)
6. Fats, Oil & Grease (FOG) Program
7. System Evaluation and Capacity Assurance Plan
8. Communication Plan

1. Management Plan

The CMOM Program Annual Report provides a summary of CMOM Program activities. The report is intended for District staff, regulatory authorities, customers, and the general public. HPUD's CMOM Management Plan describes the approach that the District is undertaking to ensure all necessary activities and programs are in place in order to support the CMOM Program.

Each year, the annual report details the progress toward meeting objectives of the Plan. Following is a list of some of the major accomplishments that have helped move the CMOM Program forward:

- Continued implementation of the Collection System Preventative Maintenance Inspection Program (PMI) in order to identify, pinpoint and prioritize areas of the collection system that need rehabilitation or replacement;
- Use of the Geographic Information System (GIS) data as the basis for the asset management system for collection system & treatment plant infrastructure.

2. Performance Measures and Management Review

The review of the performance measures is intended to be an evaluation of the District's status with respect to achieving its CMOM objectives. The purpose of the performance measures is to

track District activities over time and gauge achievement of CMOM program objectives. Some of these performance measures have been selected as key measures to gauge the overall performance of HPUD in the areas of collection system operations and maintenance and capacity assurance. The CMOM Management team held its annual review of the program on January 17, 2017 to evaluate the goals and objectives of the CMOM program and review Performance Measures. *(A summary of the performance measures is included in Appendices as Attachment 1, Performance Measures).*

3. Data and Asset Management

Throughout 2016, the District continued to improve asset management processes and data quality and accuracy. The District initiated enhanced improvements to the process of tracking capital project costs at the asset level in 2016. A primary goal of this initiative was to provide accurate construction costs for assets that will improve our ability to perform life cycle cost analysis and will also provide an accurate database of cost information to use for future estimating.

The most recent Data Management Project consisted of the construction of a project management data warehouse (PIMS). PIMS consists of the following modules/functions: Project Budgets, Contracts and Payments, Project Financial Summaries, SSO Tracking, Backflow Prevention Records, Construction Inspection Logs, Bids, Permits, Project Assets, Drawing and Scan Management, Employees, and Business Contacts.

Reports can be configured for internal or external use. The system also contains tools allowing individual users to create custom reports. Reports generated from system information are created using SQL Reporting Services. Training and implementation has been tailored to specific user groups; such as project managers, IT staff, financial staff, and system administrators. Concurrent with the training sessions, final systems integration work is taking place to ensure that system refinements from testing are in place and functioning correctly.

4. Capital Improvements Plan (CIP)

The 5-year Capital Improvements Plan (CIP) is a tool to ensure adequate financial resources are obtained to fund required components of the sewer capital improvements plan. The CIP is discussed in more detail in Section 5.0 of this report and a summary of the plan is included in Appendices as *Attachment 2 - Sewer System Capital Improvements Plan (CIP)*

5. Sewer Overflow Response Plan (SORP)

The Sanitary Sewer Overflow Response Plan (SORP) describes the measures the District has put in place for response, containment, clean up, stream sampling and analysis, public notification and regulatory reporting of overflows in the collection system. The SORP details the steps to be taken when a potential overflow is identified, categorization of whether it is a wet weather or dry weather SSO, and if it reaches State Waters.

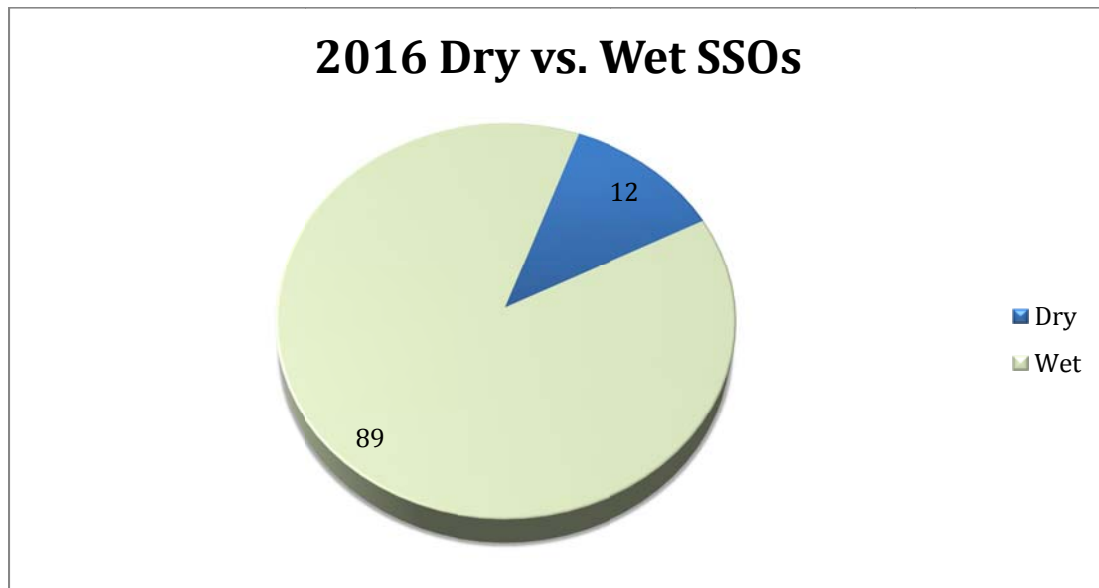
Historically, the District has been collecting data on pipe defects, line blockages, mechanical or electrical equipment problems, and, inflow and infiltration, which are the primary causes of sanitary sewer overflows. The Sewer Operations and Maintenance Superintendent has a dedicated staff that oversees operation and maintenance activities in the collection system, including SSO response and clean up.

The Sewer Operations and Maintenance Superintendent maintains the SSO tracking system in the PIMS Database. Overflow data is also incorporated into the GIS. The following section of this report details specifics about SSO data captured during this reporting period. *(See Attachment 3 - Map - 2016 SSO locations).*

a. Summary of SSO Data

HPUD is undergoing adjustments to both the data input and output processes for Cityworks to generate more precise data for use in these annual reports. HPUD continues to move forward with structuring its reporting procedures, and enhancing and improving data input and output, quality assurance and quality control processes.

For the 2016 calendar year, there were a total of 101 SSOs (Jan 1, 2016 to Dec. 31, 2016) due to either operational issues or wet weather events throughout the HPUD service area. A total of 89 of the discharges were due to wet weather events and attributable to inflow/infiltration. The other 12 discharges were dry weather overflows as reflected in the chart on the next page.

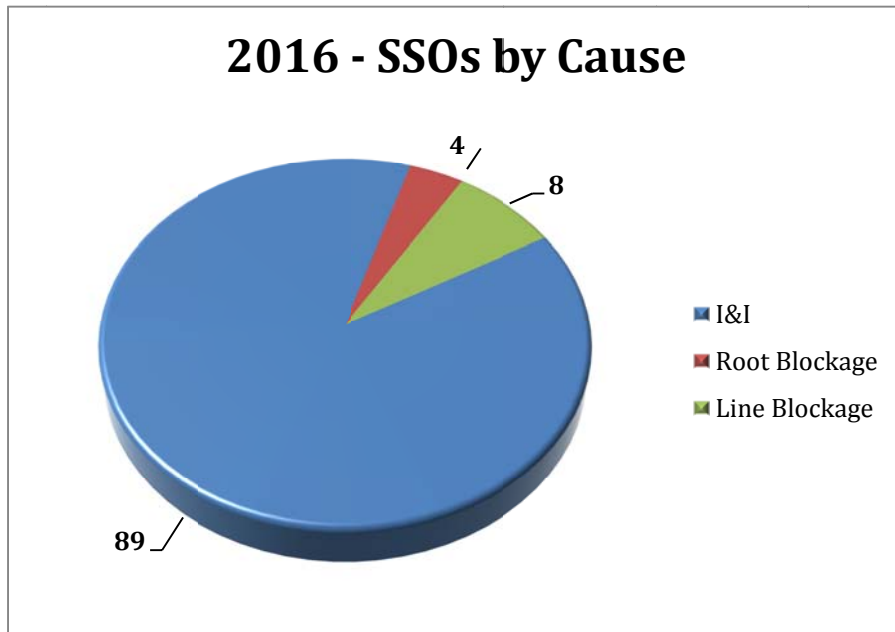


Dry Versus Wet Weather SSOs - 2016

Of the 12 recorded dry weather SSO events during the 2016 annual reporting period, most were caused by operational issues such as line blockage, roots or debris. The majority of the SSO's (89) were caused by wet weather issues attributed to inflow and infiltration. All SSOs are documented in the PIMS database and in the GIS and are periodically reviewed to identify if any trends or localized problem areas (such as past overflows or proximity to recurring SSOs) exist that warrants the need for a larger-scale inspection or rehabilitation project.

b. Summary of SSO Events by Cause

All SSOs, regardless of the cause, are immediately responded to and the problems are remediated as soon as possible. Parts of the collection system where blockages occurred are put on a cleaning program to be inspected and cleaned as needed, or placed on a schedule for rehab or replacement.



Summary of 2016 SSOs by Cause

6. Fats, Oil & Grease (FOG) Program

HPUD has continued to outsource grease trap inspections. Since late 2009, HPUD has contracted with Robert G. Campbell & Associates (RGC&A) to conduct grease and grit trap inspections. For the calendar year of 2016, RGC&A conducted 499 inspections on 149 businesses. The frequency of the inspection varies as to the type of business and whether follow up inspections are necessary. Contracting with a third party for inspections and management of the program has enabled HPUD Collection System staff to be more effective in the operation and maintenance of the collection system. HPUD staff periodically review and update the written FOG Program.

7. System Evaluation and Capacity Assurance Plan

The Capacity Assurance Plan was submitted to TDEC on March 17, 2015 and HPUD received approval on May 23, 2015. In response to TDEC's review of HPUD's System Evaluation and Capacity Assurance Plan, HPUD will undertake the following objectives:

- Continue to address HPUD's I/I problem
- Continue to identify collection system rehabilitation priorities
- Complete Capital Improvement Projects such as Dry Gap Pike 5MG equalization/ storage tank and the two phase project for upsizing and replacing the Beaver Creek Interceptor
- Continue the preventative maintenance inspection program
- Continue with pump station improvements
- Continue calibration and monitoring of HPUD's 9 permanent stations

One of the tools utilized to develop the District's System Capacity Analysis Plan is HPUD's collection system hydraulic model. With its development in 2005, the HPUD collection system model has been periodically updated over the last 10 years to reflect the ongoing improvements to the collection system assets. Flow characteristics are calibrated by utilizing rainfall and flow monitoring information data. HPUD has nine permanent flow monitoring stations with three rain gauges currently in place. The most recent update and calibration of the model occurred in September 2014.

The updated and calibrated collection system hydraulic model was used to perform the capacity assessments. The objectives of the capacity assessment included the following objectives:

- Identify locations and causes of hydraulic constraints in the collection system;
- Assess the Beaver Creek WWTP ability to accommodate/treat peak flows
- Assess how existing sewer system performance will be improved by planned rehabilitation and improvement projects, and
- Assess the performance of planned rehabilitation projects to accommodate future population growth

8. CMOM Communication Plan

The Communication Plan is used to document the types and frequency of communications that will be prepared and distributed regarding the status of the CMOM Program and CMOM Annual Report. The Hallsdale-Powell Utility District communicates with the Tennessee Department of Environment and Conservation (TDEC), the HPUD Board of Commissioners and our customers on a regular basis.

The Hallsdale-Powell Utility District meets on a monthly basis to determine policy issues related to finance, personnel, operations, sanitary sewer system improvements and other HPUD business. Any significant SSO events or other capacity issues are often presented and discussed at the Board meetings. Currently, HPUD utilizes its quarterly customer newsletter, CMOM annual report, and the new website, www.hpudactnow.org, to update customers on issues related to the sewer collection system.

HPUD collects data and disseminates information regarding the results of progress toward the CMOM Program with the management team, employees, and members of the public. Annual meetings are held which include a presentation of HPUD's CMOM program, information about upgrades at the wastewater treatment plants, upgrades to wastewater lift stations, and data collected regarding inspections of the wastewater collection system.



Citizen's Academy 2016

The CMOM Communication Plan documents the types and frequency of communications that are prepared and distributed regarding the implementation of the CMOM Program. The past year's activities also included communication of the CMOM Program to the public at various venues such as the customer newsletter, at an annual Citizen's Academy held on March 22, April 27 and May 25 and at a presentation to the Board of Commissioners on June 20.

Part of HPUD's communication efforts involve posting information about upcoming and completed projects at www.hpudactnow.org. This site is strictly dedicated to communication about HPUD wastewater infrastructure and projects associated with the 2014 Consent Order.

SECTION 2.0 - COMPLETED, ONGOING & PLANNED INFRASTRUCTURE PROJECTS

SECTION 2.0 – COMPLETED, ONGOING AND PLANNED PROJECTS

A. Completed and Ongoing Collection System Projects FY 2016

The major collection system projects that were completed in 2016 included the following:

1. Preventative Maintenance and Inspection (PMI) Program
 - a. 2016 PMI – Remainder of the Sanitary Sewer System
 - b. 2016 PMI – HP06 & HP08
2. Flow Monitoring
 - a. Long Term/Permanent Flow Monitoring
 - b. Temporary Flow Monitoring – HP08 & HP09
3. Dry Gap Pike Sanitary Sewer Overflow Tank
4. Beaver Creek Interceptor Replacement – Easement Acquisition

1. Preventative Maintenance & Inspection (PMI) Program

Establishment of a preventative maintenance and inspection program targeting problematic areas in the collection system is a key to preventing sanitary sewer overflows (SSOs). HPUD began implementation of this program in late 2006. The preventative maintenance inspection activities include manhole inspections; smoke testing, closed-circuit television (CCTV) inspection, pre-conditioning and pipeline cleaning.

Results of these investigations were captured digitally and integrated into HPUD's Geographic Information System (GIS) and a final summary report was prepared detailing the problems found and the priority in which they should be addressed. As in past years, HPUD continued this program into FY 2016 by completing 1,211 manhole inspections and cleaning and/or closed-circuit television (CCTV) inspection of 241,121 linear feet of sewer pipeline. To date, HPUD has completed inspections on 95% of the manholes and 95% of the gravity sewer pipelines in the collection system. *(See Attachment 4 Map – Annual PMI inspections from 2006 to 2016).*

a. 2016 PMI – Completion of the System

In February of 2016, Hallsdale-Powell Utility District entered into a contract with Compliance EnviroSystems to clean and inspect approximately 287,200 linear feet of sanitary sewer mains ranging from 6" – 30" in diameter using closed-circuit television (CCTV), smoke testing approximately 281,750 linear feet of sanitary sewer mains ranging from 6"-12" in diameter, and the inspection of approximately 1,270 manholes either by 3D manhole inspection method or pole camera inspection method. The purpose of this project was to identify any infiltration or

other defect that would negatively affect the system and to perform any inspections that had not been completed throughout the system in previous PMI projects. HPUD will use the inspection information to address any defects found during the inspection of these line segments. The majority of these inspections were completed in 2016 and will continue into 2017. (*See Attachment 5 - Map - 2016 PMI CCTV Inspections, Attachment 6 - Map - 2016 Manhole inspections*).

b. 2016 PMI – HP08 & HP06

Hallsdale-Powell Utility District extended and expanded the 2016 PMI contract with Compliance EnviroSystems as a result of unused funds from the original contract. The focus of this project is concentrated in sub-basin HP08 and basin HP06. Both sub-basin HP08 and basin HP06 have been identified as areas with excessive infiltration from temporary and permanent flow monitoring projects. The additional scope of work includes the cleaning and inspection of approximately 154,215 linear feet of sanitary sewer mains ranging from 6” – 24” in diameter using closed-circuit television (CCTV), and the inspection of approximately 670 manholes by the pole camera inspection method. The purpose of the additional scope of work is to identify any infiltration or other defect that would contribute to SSOs or negatively affect the sanitary sewer system. HPUD will use the inspection information to address any defects found during the inspection of these line segments. The inspections began in December 2016 and will continue into 2017.

2. Flow Monitoring

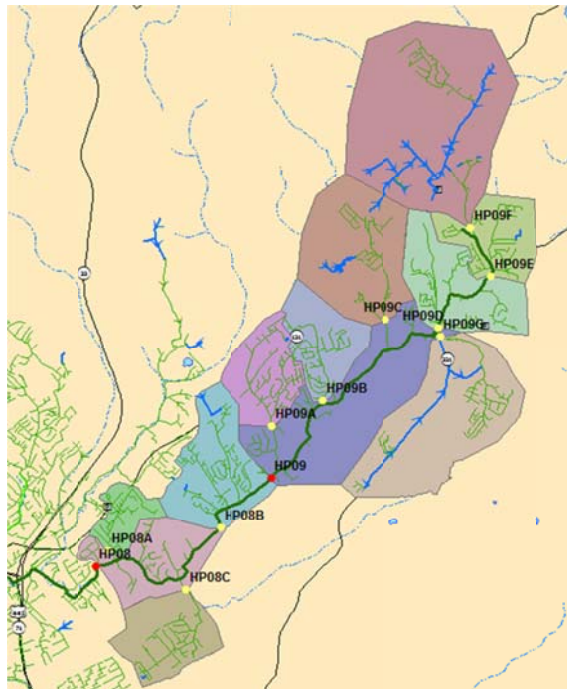
One of the key tools for enabling Hallsdale-Powell Utility District to analyze the performance of the sewer system is flow monitoring. Since 2004 HPUD has maintained continuous Flow Monitoring Units throughout the collection system. These flow monitoring devices have been installed within selected manholes at locations which are able to provide the best information to HPUD about how the collection system is performing on dry days or wet weather days.

The geographic location of each sewer basin and associated flow monitors and rain gauges are shown on the map provided on the next page. A summary of results from both long term and temporary flow monitoring is provided.

a. Long-Term/Permanent Flow Monitoring

During 2016, the Hallsdale-Powell Utility District continued long-term flow monitoring at nine locations, along with rainfall monitoring at three locations. During Winter 2015 and Summer 2015, wet weather peaking factors up to 9.38 and 12.50, respectively, were observed.

While rain-dependent inflow and infiltration (RDII) data show a decreasing trend over the past several analysis periods, frequent surcharge conditions remain a concern along the main trunk line.



Location of Temporary Flow Monitoring in Basins HP08 & HP09

b. Temporary Flow Monitoring - HP08 & HP09

In 2016, Hallsdale-Powell Utility District contracted with ADS Environmental Services (ADS) to perform a temporary flow monitor study in Basins HP08 and HP09. The purpose of the study was to identify which areas in basins HP08 and HP09 had the highest I/I, possibly contributing to a couple of SSOs in the area.

The study period was conducted from 03/12/2016 to 06/21/2016 – over a total of 103 days. The project included 10 temporary flow monitors that were evaluating 12 sub-basins. ADS observed 10 rain events of interest that ranged from 0.12 inches of rainfall to 1.7 inches of rainfall.

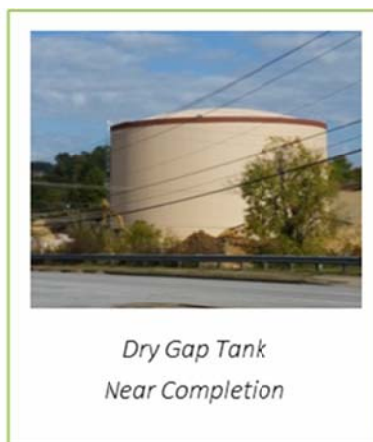
The results from the temporary flow monitoring study show two sub-basins, HP08 and HP09D, to have more estimated Rain-Dependent Inflow and Infiltration (RDII) during a projected 1-inch Rain Event than the other monitored sub-basins. Since sub-basin HP09D was part of a PMI project in recent years, Hallsdale-Powell is going to begin doing repairs on defects in the sub-basin that could contribute to I/I. Sub-basin HP08 was added to the original scope of the PMI 2016 project to be inspected in 2017. HPUD will use the inspection information to address any defects found during the inspection of these line segments.

3. Dry Gap Pike Sanitary Sewer Overflow Tank – Construction

Construction began on the 5 MGD storage tank in August 2015. Robert G. Campbell & Associates (RGC&A) are the design engineers and the general contractor is J. Cumby Construction, Inc. The Dry Gap Sanitary Sewer Overflow Tank was designed to help alleviate sanitary sewer overflows during peak flow events when the sewer system is overwhelmed by heavy rainfall of high intensity and long duration.

The construction site for the Dry Gap Tank is the land owned by HPUD where the former Dry Gap Water Treatment Plant was located. This site was chosen based on engineering and design estimates obtained from system hydraulic modeling, which determined ideal placement of the tank to help alleviate chronic wet weather SSOs. The primary purpose of the structure is to temporarily store rainwater and wastewater during heavy rain events. At the end of 2016, the tank was 98% complete. The project is being funded through the Clean Water State Revolving Fund (SRF).

Dry Gap Wastewater Storage Tank Project



4. Beaver Creek Interceptor Replacement – Easement Acquisition

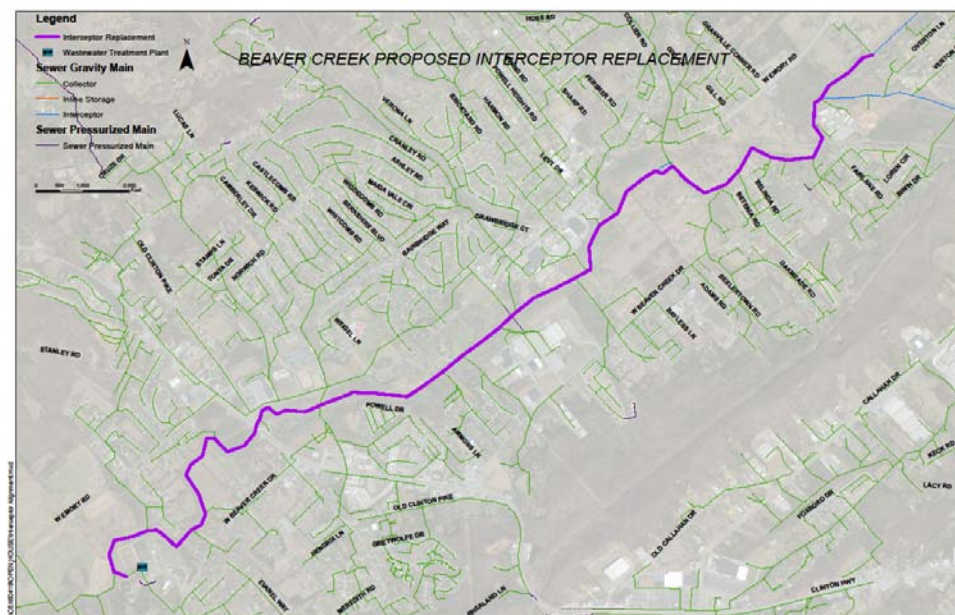
Scope: The Beaver Creek Interceptor Improvement Project consists of replacing the existing 36-inch diameter interceptor beginning at the Beaver Creek WWTP and continuing for approximately 11,300 linear feet into the HPUD collection system near the existing interceptor's crossing of Brickyard Road in Powell.

The existing interceptor will be replaced with a new 48-inch diameter interceptor, accompanying manholes and other structures, 300 linear feet of sewer line near West Emory Road and Clinton Highway, and 2,200 linear feet of sewer line replacement. An additional 14,500 linear feet of lines and manholes are planned to be rehabilitated as part of the project.

The project is scheduled to begin in spring 2017 with an expected duration of approximately 36 months to complete.

Easement Acquisition: At the time of this report, easement acquisition is nearly complete for Contract 1 and underway for Contract 2. Permitting efforts related to Contract 1 and Contract 2 are underway and continuing. The preparation and submission of funding application to SRF for Contract 1 is also underway. Drawings and specifications for Contract 1 have been prepared and submitted to the State for comments and approval.

For more detailed project information, refer to HPUD Beaver Creek Interceptor Improvement Project, Contract 1, Clean Water SRF Facilities Plan, submitted to TDEC by Jacobs Engineering on September 30, 2016.



Proposed location of Beaver Creek interceptor replacement

B. Completed, Ongoing and Planned Wastewater Treatment Plant Projects

Beaver Creek Solids Handling Improvements: A study was completed in 2015, of solids handling improvements at Beaver Creek WWTP and return activated sludge/effluent hydraulic improvement; review of waste solids projections and operations; development of long-term options, capital costs, and life-cycle costs for solids improvements; review of RAS/effluent piping performance, coordination of field investigation, and recommendation of modifications.

Process design and equipment selection was completed in late 2015 for the Phase III Solids upgrade at Beaver Creek WWTP. Preliminary and final design of this project was completed in 2016 for the implementation of the recommended solids handling improvements and a construction contract was awarded in May 2016. Approximately 60% of the construction work was completed in 2016, with a construction completion date set for the end of May 2017.



New Jet Aeration Piping in Digester #5



Structural Steel for Covered Storage Pad

C. Completed, Ongoing and Planned Pump Station Projects

Pump station reliability continues to be a focus of the HPUD collection system improvement efforts. The District's Capital Improvements Plan (CIP) has provisions for continued upgrades and rehabilitation of existing pump stations. HPUD personnel will continue to monitor the pump station performance within the collection system to determine if any sites will require major rehabilitation in future years. In 2016, two existing pump stations were replaced. Yellow Brick Pump Station was completed in April, and Campbell's Point Pump Station was completed in August.



Old Yellow Brick Pump Station



During Construction



Completed Yellow Brick Pump Station



Old Campbell's Point Pump Station



During Construction



Completed Campbells's Point Pump Station

SECTION 3.0 - SUMMARY OF EDUCATION & OUTREACH ACTIVITIES

SECTION 3.0 - SUMMARY OF EDUCATION AND OUTREACH ACTIVITIES

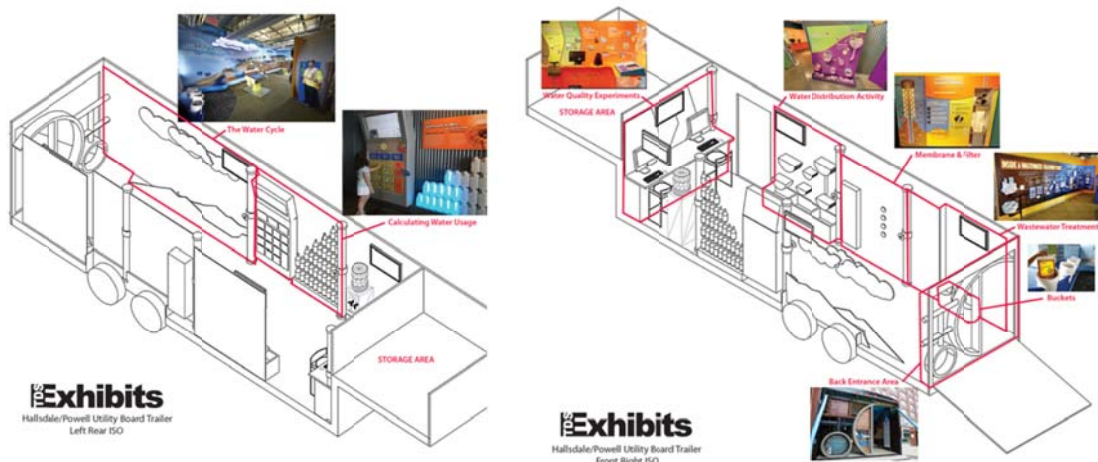
A. Supplemental Environmental Project for TDEC Consent Order WPC-14-0044

In response to the TDEC Consent Order and Assessment WPC-14-0044 issued on 8/24/14, HPUD proposed a Supplemental Environmental Project (SEP) for consideration on 9/24/15. The original project submission consisted of a mobile classroom utilizing an old school bus. In early 2016, HPUD personnel revised the project's scope of work and submitted a letter to TDEC on 8/27/16 to request additional time to complete the revised project. On 9/12/16, TDEC issued a letter granting final approval for the revised SEP.

The project is expected to be completed in September 2017. A multi-disciplinary project team consisting of graphic designers, exhibit fabricators and HPUD personnel will provide design, construction and production support for the Hallsdale-Powell Utility District (HPUD) Water on Wheels trailer. This trailer will be filled with interactive, traveling exhibits that will target multiple audiences within the HPUD service area. HPUD staff will prepare curriculum guides that will correlate with the State of Tennessee's curriculum and classroom objectives.

The proposed exhibits that will be housed in the Water on Wheel Educational Trailer will illustrate the following learning concepts:

- Water Cycle
- Watershed and Source Water Protection
- Water Treatment & Distribution
- Water Use & Conservation
- Water Quality
- Wastewater Collection & Treatment



Sketches of HPUD trailer layout

B. Utility Tours - HPUD Water Treatment Plants

HPUD's Melton Hill Water Treatment Plant, originally built in 1962, has undergone a series of extensive upgrade projects during the past five years and is one of the State's largest and most advanced membrane filtration plants. Since the water cycle and water treatment fit into the curriculum of both middle and high school students, HPUD offers tours for the Melton Hill Water Treatment Plant. On November 30, 2016 students from Halls High School Watershed Class toured the facility, where they learned about the water treatment process and water quality tests performed in the water quality laboratory.

The Norris WTP membrane ultrafiltration plant uses GE/Zenon membranes and uses technologies such as onsite chlorine generation and chlorine dioxide for pre-disinfection. HPUD takes every opportunity to educate customers about the need for better infrastructure through use of the website, newspaper articles, company newsletters and presentations at the monthly Board meetings.



Lead operator giving students a tour of Melton Hill Water Treatment Plant

C. Utility Tours – HPUD Wastewater Treatment Plants

One of the other educational outreach efforts that HPUD embraces is to provide tours of the recently renovated Beaver Creek Wastewater Treatment Plant. Some of the various groups that have toured the facility within the past few years are Halls High School students, AmeriCorps students, West High School students, Grace Christian Academy students, Halls Business & Professional Association student interns and other community groups.



Photos show Wastewater Plant Operator giving students from Halls High School tour of BCWWTP

D. Community Outreach: Halls Outdoor Classroom Sponsor

The Halls Outdoor Classroom (HOC) is a community partnership project for which HPUD has provided financial support and in-kind service to make the site adjacent to Halls High School an educational resource for the community.



New Outdoor Classroom Sign

Each year the AmeriCorps students, community partners, teachers and students participate in an annual celebration. HPUD's initial contribution to the site was obtaining building materials, constructing the footbridge and fence, adding water service and providing food and drinks for the annual HOC Celebration. Each year, HPUD provides food for the annual event.



HPUD serving food at 2016 HOC Celebration

E. Community Outreach: Brickey McCloud Elementary School Duck Race

Another fun community event that Hallsdale-Powell Utility District assists with annually is a Rubber Duck Race at Brickey McCloud Elementary School. This event takes place in the fall of every school year. All students in each of the grade levels race rubber ducks down a hill to win a prize provided by the school.

Hallsdale-Powell Utility District Education/Outreach Team makes annual preparations for the event and provides the water for the duck race from the Emory Road Water Booster Station. This year's event was held on October 7, 2016.



HPUD employees helping Brickey students with the 2016 Duck Race

F. Communicating Infrastructure Investment - Citizens' Academy

Beginning in late summer 2014, HPUD hosted a series of meetings with a focus group of customers representing various segments of the District's customer base including small business, local government, medical fields and banking. The HPUD Citizen's Academy in 2016 was a series of three monthly meetings which were held on March 22, April 27 and May 25, 2016.



*Photo above left shows Darren Cardwell presenting at Beaver Creek WWTP.
Photo at the right shows a member viewing an E. coli test at Beaver Creek WWTP.*

This series of meetings and presentations provided attendees with an overview of HPUD's water and wastewater facilities, infrastructure needs, and issues facing our industry. The first meeting was held at the Operations Building on Cunningham Road and consisted of a series of hands-on exhibits, presentations, videos, and storyboards. Tours were conducted of the Beaver Creek Wastewater Treatment Plant and the Melton Hill Water Treatment Plant at the second and third meetings.

F. Water on Wheels Program (WOW) For District Elementary Schools

In 2004, HPUD developed the “Water on Wheels” Program in order to educate area elementary schools about the importance of water quality and the impact it has on everyday life. During the past year, HPUD provided the program to about 400 students within the HPUD service area. This hands-on activity focuses on educating students about the basic components of the water treatment process.

Beginning with a discussion about where our drinking water comes from, the students have an opportunity to learn about the kind of contaminants that could be in our water sources and how they might get there. Students learn concepts about “source water protection” and taking personal responsibility for water conservation and preserving water quality.



3rd Grade students making water filters for HPUD’s Water on Wheels Program

G. Knoxville Area Medication Collection Program

The Knox-Area Medication Collection Program started in 2008 to keep unwanted medications and over-the-counter drugs off the streets and out of the hands of children.



Drug Collection Event at Healthy Living Expo 2016

HPUD joined the program in fall of 2009 due to an interest in protecting the community's water source. Since the program began, partners have collected approximately 7,000 lbs. of unwanted medication through these organized collection events and the installation of a permanent drop box at the Knoxville Police Department's downtown station. HPUD has been a co-sponsor of several Knox County collection events. In September and October 2016, HPUD included a statement on its bills advertising a medication takeback in the District on October 29, 2016.

H. Education/Outreach with Local Schools

In addition to the Water on Wheels Program and other educational programs, HPUD has provided in-kind services and equipment such as donating of colorimetric water quality test kits to AmeriCorps workers. The AmeriCorps students used the test kits in their work with elementary school students in the local "Adopt a Watershed" Program. HPUD continues to provide support for educational programs in the local schools within the District.



HPUD's Water Drop Mascot "Tappy" Teaching Students about Water Treatment

In summer 2012, HPUD solicited contributions from our Engineering Firms and other professional organizations for a Water Drop Mascot. "Tappy" is now a cornerstone of HPUD's education/outreach efforts with local school children. "Tappy" goes to classrooms for Water on Wheels for encore performances when discussing water conservation, water treatment and wastewater treatment concepts.

I. Community Outreach – Water Conservation

WaterSense, a partnership program sponsored by the U.S. Environmental Protection Agency, encourages Americans to save water and protect the environment. Since fall 2008, HPUD has been an EPA *WaterSense* Partner. HPUD uses these promotional materials to supplement our educational programs about water conservation and use them in customer newsletters and as articles on the company website, www.hpud.org.



Display Set Up in HPUD Administration Building Lobby for Fix A Leak Week

Beginning in spring 2012, HPUD hosted its first annual *WaterSense* Promotional Event, partnering with Modern Supply Wholesale for “National Fix a Leak Week” March 12-16, 2012. Modern Supply set up a promotional display in the HPUD lobby with *WaterSense*-labeled products such as toilets, showerheads and faucets.

HPUD set up educational displays showing a prototype of a water meter, provided handouts for customers “How to Read a Water Meter” and provided dye test tablets and pamphlets about diagnosing a leaky toilet. HPUD sets up displays in our main lobby and observes “Fix A Leak Week” during March of each year.

SECTION 4.0 - CHANGES TO CMOM PROGRAM & CAPACITY ASSURANCE PLAN (CAP)

SECTION 4.0 - CHANGES TO CMOM AND CAPACITY ASSURANCE PROGRAM

HPUD's focus for the future of the CMOM Program will rely heavily on Engineering Support and Management and good sound financial management to fund sewer system improvements over the next ten (10) years.

A. Engineering Support and Management:

HPUD continues to rely on support from various consultants to assist in the implementation of a comprehensive System Capacity Assurance Program. The goal of this program is to establish short and long-term actions to address hydraulic deficiencies including prioritization, alternative analysis, and a schedule for completion of these steps.

A key component of this program was the completion of the Wastewater Master Plan in August of 2006. Acceptance and approval of this comprehensive plan was granted by TDEC on October 19, 2006 and work continues toward meeting the proposed goals. The District continues to utilize several consultants to assist HPUD with implementing the components of the Wastewater Master Plan, as well as the long term Corrective Action Plan (CAP) for both the Collection System and the Wastewater Treatment Plants.

The primary goals of the CAP at this time are to continue the Preventative Maintenance and Inspection (PMI) Program and develop a list of priority repairs to the collection system. This work is essential in assisting HPUD assess and manage the collection system. This work in conjunction with selecting optimum sites for installing equalization basins for wet weather storage during rain events will allow the District to continue reducing the number of sanitary sewer overflows with the collection system.

B. Financial Management:

Due to regulatory requirements, HPUD was required to pass along rate increases to District customers to fund the ACT Now Program which was a direct result of new infrastructure projects to meet the August 2014 Consent Order. Our aging infrastructure, along with regulatory demands from EPA and TDEC to lower SSO numbers for compliance, placed financial constraints on the District and our customers.

HPUD has continued to focus on developing a solid capital improvement and financial plan to fund the significant improvements required as a result of this Consent Order. One of the key tools in HPUD's financial management plan is a rate model developed by Raftellis Consultants. HPUD tries to keep rates competitive so as to avoid placing an excessive financial burden on the HPUD customers.

In response to the 2014 Consent Order - ACT Now Program, a new rate structure was first approved by the HPUD Board of Commissioners in March 2015. Initial Rate increases under the new structure took place in fall 2016. More recently, the Budget for Fiscal Year 2018 (April 1, 2017 - March 31, 2018) was presented for consideration at the February Board Meeting which was held on 2/13/17. The budget was approved unanimously at the March Board meeting held on March 20, 2017. The approved Budget will be submitted to the Tennessee Comptroller of the Treasury for review and approval. Discussion at the March Board meeting also focused on the revised water and sewer rate schedule for FY 2018.

These revisions are necessary to fulfill the District's debt service requirements and fund the 2014 Consent Order from the Tennessee Department of Environment and Conservation (TDEC). The Board of Commissioners approved the revised rates and adopted the revised rate schedule, which incorporates a three (3%) percent increase in water rates and a six percent (6%) increase in sewer rates. These rates will become effective on September 1, 2017.

HPUD remains committed to ensuring rates support the Capital Improvement Projects outlined in our Capital Improvements Plan (CIP) through FY 2025. To ensure our ratepayers understand the importance of these rate changes, there is a continued communication effort by the District using the HPUD website, newsletters, mailers and pamphlets and newspaper articles.. We plan to continue developing a solid capital improvement and financial plan to fund the significant improvements required as a result of this Consent Order.

SECTION 5.0 - OVERVIEW OF HPUD'S CAPITAL IMPROVEMENTS PLAN (CIP)

SECTION 5.0 - OVERVIEW OF FIVE YEAR CAPITAL IMPROVEMENTS PLAN

Most of the one-year and five-year capital improvements projects have been described in different sections of the Annual report. A summary of the one-year and five-year CIP is included in the Appendices. The strategy of formulating a Capital Improvements Plan for at least a five year period requires continuing data analysis, prioritization of system defects, and possible revision of implementation schedules from year to year.

Several projects have been prioritized and placed into the five year CIP as grant funding, SRF loans and revenue bonds are available for financing the projects. *(Refer to Attachment 2- Sewer System CIP).*

Some the key projects planned for FY 2017 and FY 2018 are listed below:

A. Planned Projects for FY 2017 and FY 2018

1. 2017 Preventative Maintenance and Inspection
2. Beaver Creek Interceptor Replacement Phase 1
3. Wastewater Pump Station Improvements
4. Continued Rehab

SECTION 6.0 - SUMMARY OF CMOM PROGRAM IMPLEMENTATION

SECTION 6.0 - SUMMARY OF CMOM PROGRAM IMPLEMENTATION

At this time, HPUD is in the second full year of implementation of the CMOM Program to meet the 2014 consent order. Most of these programs are ongoing; however, the two primary areas of focus and key CMOM program components continue to be infrastructure improvements to the wastewater treatment plant and also evaluation, inspection and prioritization of areas of the sewer collection system for rehabilitation or replacement. The Collection System Preventive Maintenance and Inspection (PMI) Program is the of the CMOM program enabling the District to achieve the changes necessary to ensure adequate capacity in the collection system, reduce and eliminate sanitary sewer overflows. The following summarizes the implementation of efforts to include:

- A. Utilization of HPUD's Geographic Information System (GIS)
- B. Enhanced Data and Information Management

A. Utilization of HPUD's Geographic Information System (GIS)

The Preventative Maintenance Inspection Program (PMI) has relied heavily on the implementation of the Geographic Information System (GIS). The GIS allows HPUD to geographically track customer complaints, work orders, collection system problems, manage collection system assets and analyze system issues.

Combined with information from the long term flow monitoring program, the data in the GIS provided HPUD with an indication of which sanitary sewer basins required further investigation and the likelihood of which sanitary sewer pipelines or manholes required rehabilitation. Each year we have further refined our database and found it to be invaluable as a tool for managing data for the CMOM program.

B. Enhanced Data and Information Management

Throughout 2016 the District continued to improve asset management processes and data quality and accuracy. Over time, the Cityworks Work Order Management System has become more compatible with the District's overall asset management program. The implantation of PIMS should help HPUD to obtain more accurate construction costs for assets. Hopefully, this will improve our ability to perform life cycle cost analysis and also provide an accurate database of cost information to use for future estimating. In coordination with the software improvements.

SECTION 7.0 - SUMMARY OF EFFECTIVENESS OF CMOM PROGRAM

SECTION 7.0 - SUMMARY OF EFFECTIVENESS OF CMOM PROGRAM

HPUD's CMOM Program reflects the District's commitment to the protection of the environment and provision of exceptional customer service to our ratepayers. As indicated throughout this report, HPUD has committed, and is prepared to further commit, the resources necessary to provide adequate funding for improvements to the wastewater system.

Necessary funds and staffing are available through operating and capital budgets and required contractual arrangements are either already in place or can be readily accomplished to meet the goals and objectives of the CMOM Program.

In evaluating the effectiveness of HPUD's CMOM Program development and implementation over the past few years, several key factors have been noted. The efficient operation and management of HPUD's collection system assets is essential as well as the ability to continuously monitor collection system performance. Documenting programs, practices, and procedures was one of the keys to help produce successful and efficient performance of the collection system.

Our main focus continues to be:

- Maintaining a comprehensive system inventory and information management system.
- Implementing an effective sewer overflow response program including better emergency response and reporting procedures.
- Performing timely and adequate collection system operation and maintenance.
- Conducting effective system hydraulic capacity assessment, evaluation, and assurance.
- Implementing and maintaining an effective public communication and outreach program.

APPENDICES - ATTACHMENTS 1 - 6

2016 PMI Manhole Inspections

Legend

2016 PMI Manholes

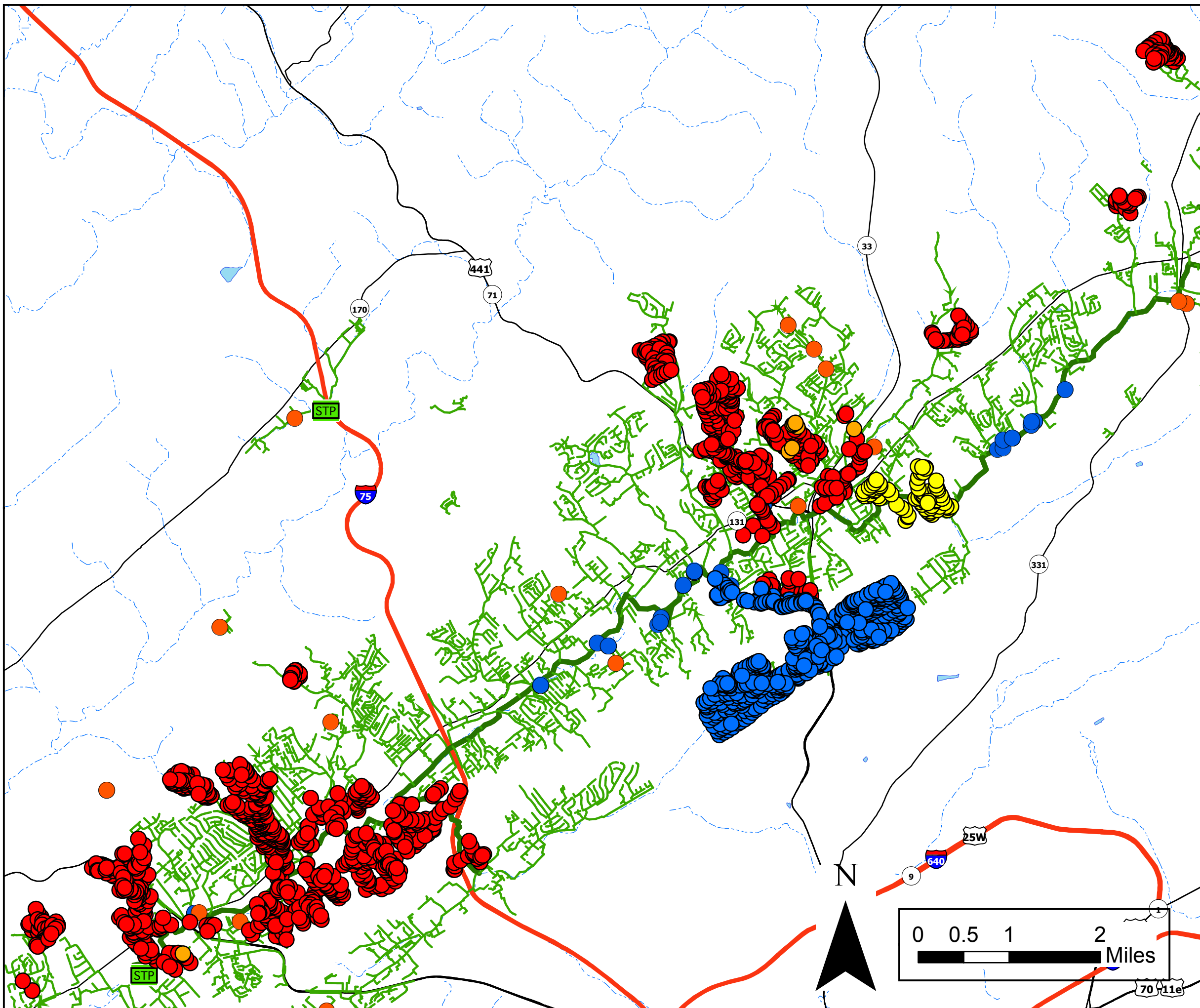
Phase

- 1
- 1A
- 2
- 3

- Collector, HPUD
- Inline Storage, HPUD
- Interceptor, HPUD
- Collector, Private

2016 PMI Manhole Notes:

- * Phase 1 and 1A are incorporated in the original contract- Completion of the System
- * Phase 2 and 3 are incorporated in the additonal scope added to the contract- HP08 & HP06



2016 PMI Sewer Line Inspections

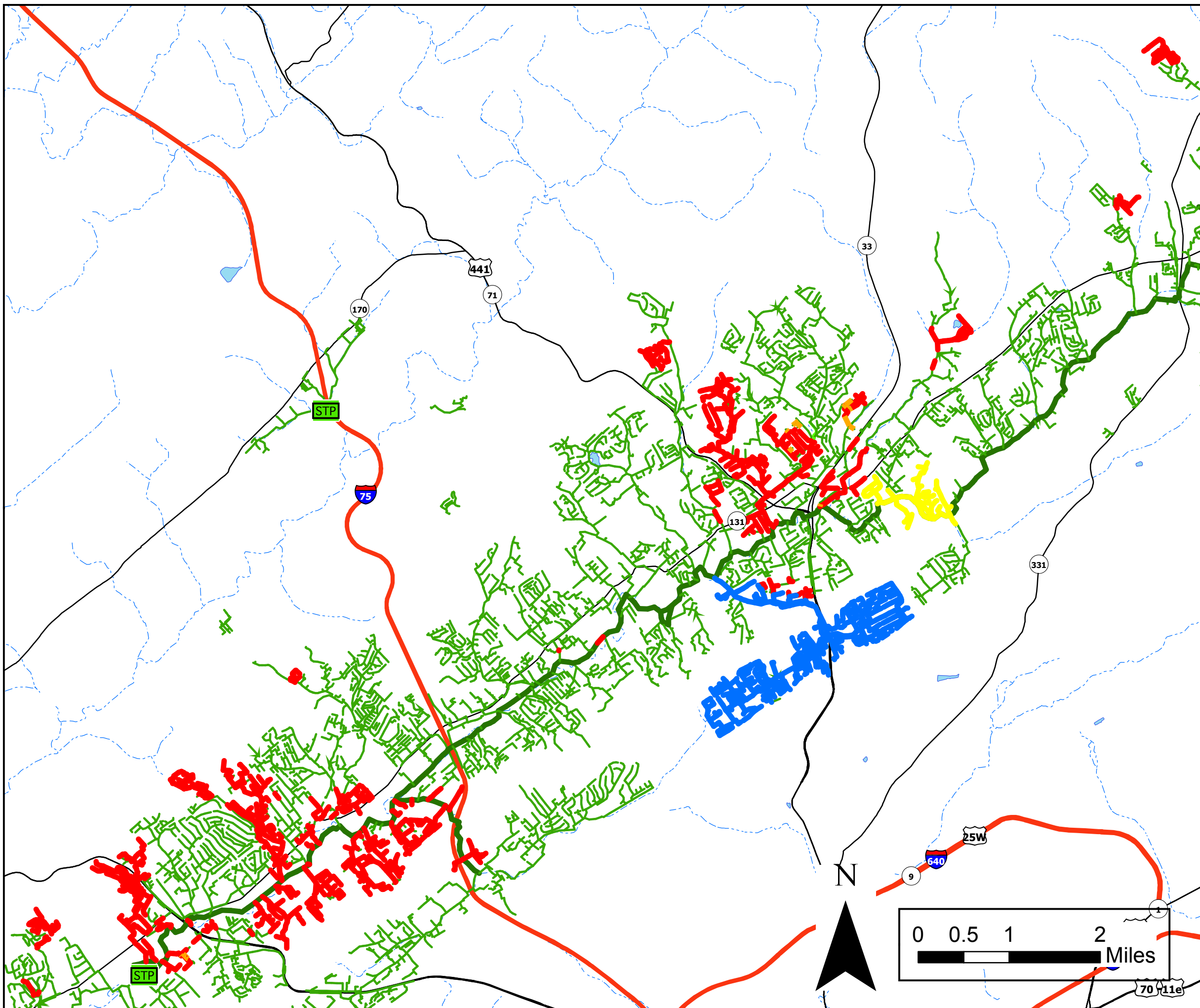
Legend

2016 CCTV/Smoke Test Lines Phase

- 1
- 1A
- 2
- 3
- Collector, HPUD
- Inline Storage, HPUD
- Interceptor, HPUD
- Collector, Private

2016 PMI CCTV/SmokeTest Notes:












- * Phase 1 and 1A are incorporated in the original contract- Completion of the System
- * Phase 2 and 3 are incorporated in the additional scope added to the contract- HP08 & HP06

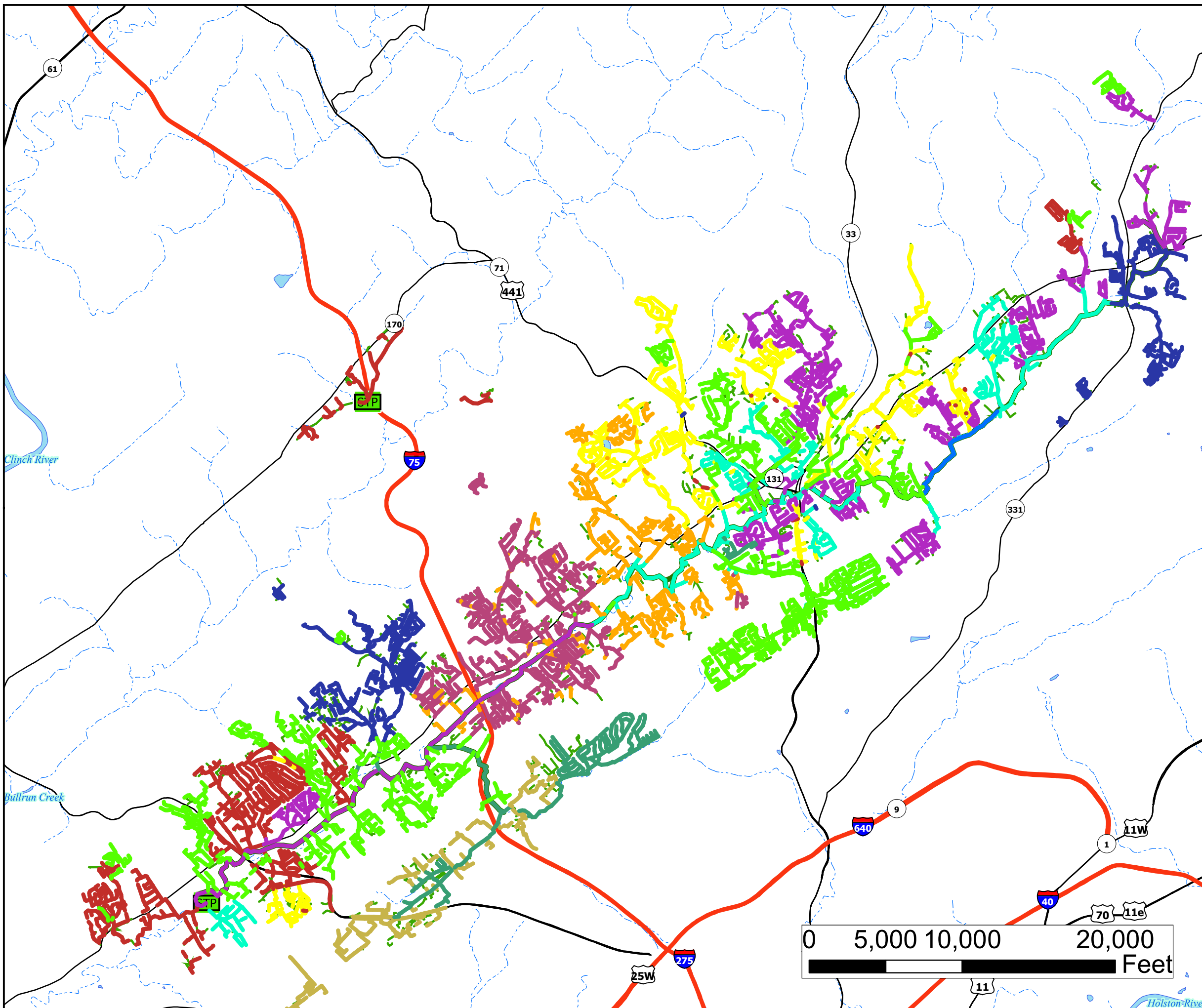


Legend

**CCTV
Inspections by
Year**

YEAR

-  2006
-  2007
-  2008
-  2009
-  2010
-  2011
-  2012
-  2013
-  2014
-  2015
-  2016



2016 SSO Locations

Legend

SSO

WET_DRY

● Dry

● Wet

→ Collector, HPUD

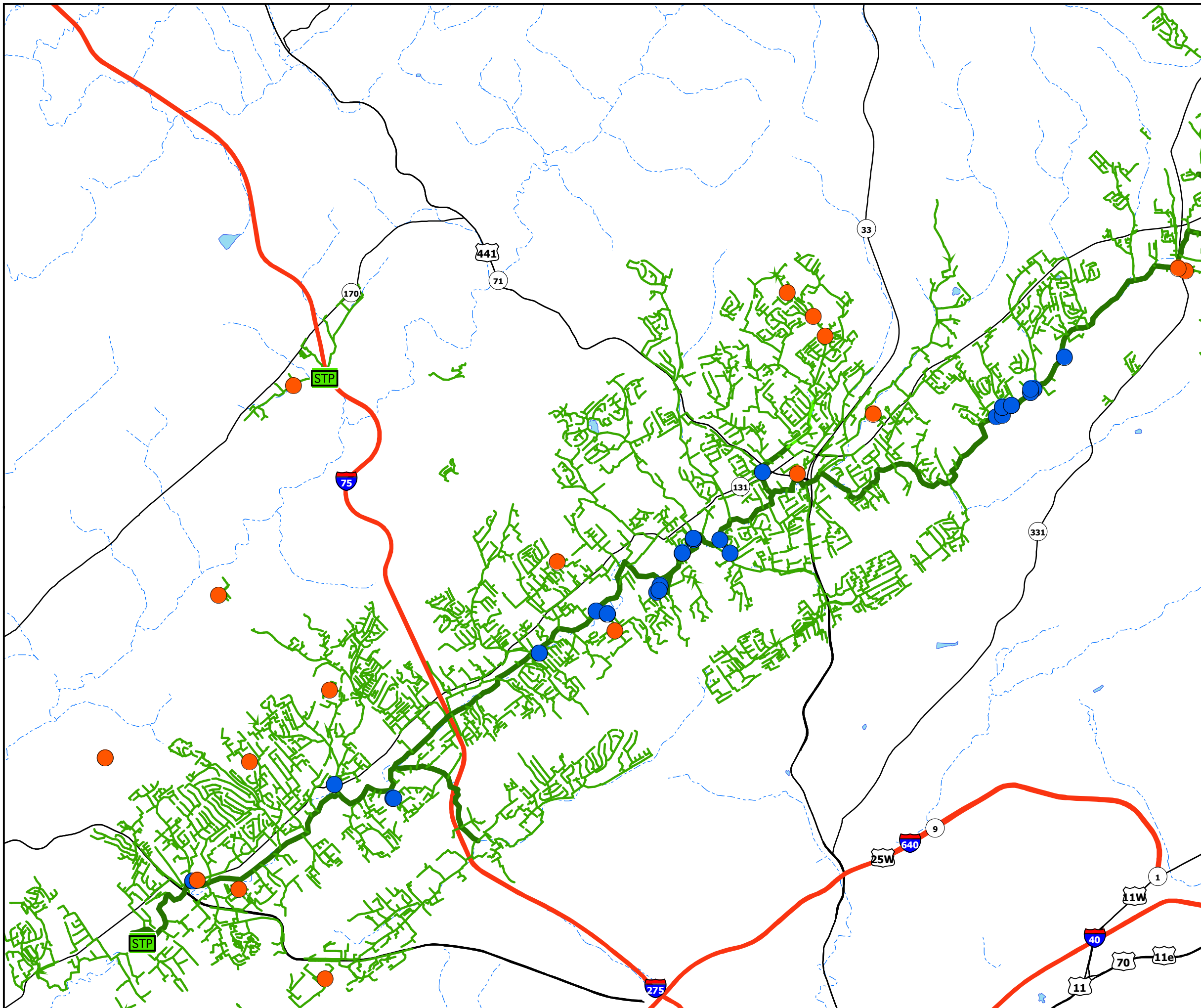
→ Inline Storage, HPUD

→ Interceptor, HPUD

→ Collector, Private

N

0 0.5 1 2 Miles



Sewer Capital Improvements

Note: FY Begins April 1st and Ends March 31st

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Sewer Rehab Basin 1F/1G & other	4,000,000								\$ 4,000,000
Sewer Rehab Basin 9B & other		4,500,000							4,500,000
Sewer Rehab Phase 4		5,000,000							5,000,000
Sewer Rehab Phase 5			5,000,000						5,000,000
Sewer Rehab Phase 6				5,000,000					5,000,000
Sewer Rehab Phase 7					5,000,000				5,000,000
Sewer Rehab Phase 8						5,000,000			5,000,000
Sewer Rehab Phase 9							5,000,000		5,000,000
Sewer Rehab Phase 10								5,000,000	5,000,000
Beaver Creek Interceptor Replacement Phase 1 SRF	8,000,000	2,000,000							10,000,000
Beaver Creek Interceptor Replacement Phase 2		5,000,000	5,000,000						10,000,000
North Fork Interceptor Imp. Phase 2		600,000							600,000
West Emory Rd Sewer Realignment	700,000								700,000
Sharps Chapel Sewer System	100,000	100,000							200,000
Beaver Creek Interceptor from Central Ave to I-75	4,500,000								4,500,000
Beaver Creek WWTP Upgrades to future solids	-			5,000,000					5,000,000
Beaver Creek WWTP Eff. & RAS/WAS pump stations & SolidsSRF									-
Beaver Creek WWTP Upgrading to handle more Flow	-					7,000,000			7,000,000
Replace Step Systems w/ Grinder Pumps	10,000	10,000	10,000	10,000					40,000
Miscellaneous Sewer Line Extensions	100,000	100,000	100,000	100,000	100,000	200,000	200,000	300,000	1,200,000
Wastewater Pump Station Improvements	150,000	150,000	200,000						500,000
Sewer Equalization Storage Dry Gap									-
Sewer Equalization Storage Norris Freeway					9,000,000				9,000,000
Sewer Equalization Storage near I-75							11,000,000		11,000,000
Sewer Investigation	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	4,000,000
Campbell Point Pump Station Improvements	-								-
Yellow Brick Pump Station Improvements									-
Total Sewer Capital Improvements	\$ 18,060,000	\$ 17,960,000	\$ 10,810,000	\$ 10,610,000	\$ 14,600,000	\$ 12,700,000	\$ 16,700,000	\$ 5,800,000	\$ 107,240,000

HALLSDALE- POWELL UTILITY DISTRICT - PERFORMANCE SPREADSHEET							
<u>Program/Performance Measures</u>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
<u>Infrastructure From GIS</u>							
# Gravity Lines (feet)	2,229,440	2,242,136	2,306,389	2,247,880	2,272,871	2,272,871	2,284,611
# Forcemain (feet)	186,866	190,934	220,549	209,296	211,105	211,105	212,523
# Connections	21,981	22,103	22,254	22,430	22,606	22,781	22,992
<u>Sanitary Sewer System Overflow Response</u>							
# Overflows	128	181	110	193	95	97	101
# Estimated Gallons of Overflows	343,525	136,500	464,600	1,037,800	356,500	799,500	898,300
# Overflows Reaching Waters	111	166	94	178	79	87	93
# Estimated Gallons of Overflows Reaching Waters	265,125	84,000	391,000	765,300	147,000	734,000	500,100
95	0 BCWWTP 3 RVWWTP	0 BCWWTP 5 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 1 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 0 RVWWTP
# Dry Weather Overflows	25	19	19	19	23	21	12
# Wet Weather Overflow Events per NPDES Permit Language							
# Wet Weather Overflow Individual Releases	103	162	91	174	72	76	89
# Overflows Cleaned Up	101	155	90	174	75	64	73
# Overflows Reported on Electronic DMR							
# Overflows Initial Report Notification to TDEC	128	181	110	193	95	97	101
# Overflows Follow-up Report Sent to TDEC within 5 Days	128	181	110	193	95	97	101
# Building Backups Due to Public System Failure during Dry Weather	22	25	16	4	20	22	12
# Building Backups Due to Public System Failure during Wet Weather	0	1	0	1	0	1	2
<u>Customer Complaint Tracking</u>							
# Complaints Received	267	250	139	210	250	306	252
# Complaints Investigated	256	250	139	210	250	306	251
# Complaints Resolved	254	198	125	202	241	294	235
# Complaints determined to be Customer Private Line Issues	62	47	36	51	88	58	53
<u>Assessment and Prioritization - Corrosion</u>							
# Locations Subject to Corrosion	None Identified To Date	None Identified To Date	None Identified To Date	None Identified To Date	None Identified To Date	None Identified To Date	None Identified to Date
# Corrosion Inspections Conducted	N/A	N/A	N/A	N/A	N/A	N/A	N/A
# Corrosion Defects Identified	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<u>Manhole Inspection/ROW</u>							
# Manholes in System	9,275	9,373	9,559	9,457	9,505	9,517	9,528
# Manholes Inspected during the Calendar Year	316	370	808	1,958	236	11	1,211
# Manholes Inspected since Program Began	4,513	4,883	5,691	6,471	7,885	7,896	9,107
# Manholes with Defects	93	184	582	(2)	160	10	388
<u>Flow Measurement (ADS)</u>							
Year of Most Recent Flow Monitoring	2010	2011	2012	2013	2014	2015	2016
Peak Flow Observed During Monitoring Period(gpd)	19,433,000	19,600,000	17,640,000	22,490,000	16,190,000	19,120,000	18,270,000
Instantaneous Peak Flow Observed(gpd)				24,824,000	18,983,000	21,198,000	20,150,000
Average Flow Observed during Monitoring Period(gpd)	6,209,000	7,250,000	7,547,000	7,654,000	6,534,000	6,868,000	6,129,000
Low Flow Observed during Monitoring Period(gpd)	836,000	240,000	4,630,000	4,101,000	4,003,000	3,902,000	3,693,000
List Basins that Contribute Flow to this Basin	See System Map	See System Map	See System Map	See System Map	See System Map	See System Map	See System Map
<u>CCTV Inspection (Contractor & Internal)</u>							
# Feet Inspected by CCTV this Calendar Year	115,548	126,264	252,622	348,108	148,549	117,880	319,630
# Feet Inspected since Program Began	1,097,345	1,223,609	1,476,231	1,445,453	1,972,888	2,090,768	2,410,398
# Feet Cleaned for Inspection	80,750	138,727	42,724	272,450	28,580	8,300	190,290
# Feet Cleaned for Routine or Scheduled Maintenance	40,852	56,210	54,153	32,015	68,328	60,424	57,713
# Defects Identified by CCTV Inspection	475	460	289	(2)	3,531	177	2,242
# Defects Catalogued or Recorded into Database	475	460	289	(2)	3,531	177	2,242

HALLSDALE- POWELL UTILITY DISTRICT - PERFORMANCE SPREADSHEET							
<u>Program/Performance Measures</u>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
Smoke Testing (Contractor & Internal)							
# Feet Smoke Tested this Year	80,750	137,845	237,021	394,198	32,657	0	275,814
# Leaks Identified on Public System	11	92	275	198	18	0	229
# Public System Leaks Repaired	107	36	148	0	9	0	0
# Public System Leaks Not Repaired This Year	0	56	127	198	9	0	229
# Public Leaks Not Repaired Since Program Began	162	218	345	360	369	369	598
# Leaks Identified on Private Service Connections	24	149	219	31	19	0	90
<u>Gravity Line Rehabilitation (Contractor & Internal)</u>							
# Feet Gravity Lines Rehabilitated	121,592	20,465	11,075	0	3,455	33418	0
# Feet Rehabilitated Since Program Began	159,757	180,222	191,297	191,297	194,752	228,170	228,170
# Feet Replaced	1,527	5,741	0	0	3,455	5497.5	0
# Feet Replaced Since Program Began	11,127	16,868	16,868	16,868	20,323	25,821	25,821
# Feet Sliplined	0	0	0	0	0	0	0
# Feet Sliplined Since Program Began	0	0	0	0	0	0	0
# Feet Cured in Place	117,905	14,724	10,295	0	0	27920	0
# Feet Cured in Place Since Program Began	156,070	170,794	181,089	181,089	181,089	209,009	209,009
# Manholes Rehabilitated	757	228	181	0	13	409	20
# Manholes Rehabilitated Since Program Began	1,090	1,318	1,499	1,090	1,103	1,512	1,532
# Manholes Replaced	1	23	0	0	20	19	0
# Manholes Replaced Since Program Began	47	70	70	70	90	109	109
# Feet of Gravity Line Rehabilitation Inspected	121,592	14,724	11,075	0	3,455	33,418	0
# Feet Of Gravity Line Rehabilitation Tested	6,100	5,741	0	0	3,455	5497.5	0
<u>Grease Program</u>							
# Facilities Identified for Inclusion in Grease Program	148	153	160	144	145	146	149
# Facilities with Installed Grease Devices	148	153	160	144	145	146	149
# Grease Installation Inspections Conducted and Documented	3	1	2		2	3	11
# Routine Grease Inspections	122	5	358	439	468	483	499
<u>Other Inspections</u>							
# Construction Inspections	7	7	8	6	6	8	9
# Pump Station Inspections	745	179	209	298	318	354	625
# Documented Pump Station Inspections	745	179	209	298	318	354	625
# Customer Owned Service Line (lateral) inspections	169	135	185	181	175	208	163
⁽¹⁾ Note this number may not be quantifiable in wet weather							
⁽²⁾ Final data numbers were not available as of the date this report was prepared							

HALLSDALE- POWELL UTILITY DISTRICT - PERFORMANCE SPREADSHEET							
<u>Program/Performance Measures</u>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
<u>Infrastructure From GIS</u>							
# Gravity Lines (feet)	2,229,440	2,242,136	2,306,389	2,247,880	2,272,871	2,272,871	2,284,611
# Forcemain (feet)	186,866	190,934	220,549	209,296	211,105	211,105	212,523
# Connections	21,981	22,103	22,254	22,430	22,606	22,781	22,992
<u>Sanitary Sewer System Overflow Response</u>							
# Overflows	128	181	110	193	95	97	101
# Estimated Gallons of Overflows	343,525	136,500	464,600	1,037,800	356,500	799,500	898,300
# Overflows Reaching Waters	111	166	94	178	79	87	93
# Estimated Gallons of Overflows Reaching Waters	265,125	84,000	391,000	765,300	147,000	734,000	500,100
95	0 BCWWTP 3 RVWWTP	0 BCWWTP 5 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 1 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 0 RVWWTP
# Dry Weather Overflows	25	19	19	19	23	21	12
# Wet Weather Overflow Events per NPDES Permit Language							
# Wet Weather Overflow Individual Releases	103	162	91	174	72	76	89
# Overflows Cleaned Up	101	155	90	174	75	64	73
# Overflows Reported on Electronic DMR							
# Overflows Initial Report Notification to TDEC	128	181	110	193	95	97	101
# Overflows Follow-up Report Sent to TDEC within 5 Days	128	181	110	193	95	97	101
# Building Backups Due to Public System Failure during Dry Weather	22	25	16	4	20	22	12
# Building Backups Due to Public System Failure during Wet Weather	0	1	0	1	0	1	2
<u>Customer Complaint Tracking</u>							
# Complaints Received	267	250	139	210	250	306	252
# Complaints Investigated	256	250	139	210	250	306	251
# Complaints Resolved	254	198	125	202	241	294	235
# Complaints determined to be Customer Private Line Issues	62	47	36	51	88	58	53
<u>Assessment and Prioritization - Corrosion</u>							
# Locations Subject to Corrosion	None Identified To Date	None Identified To Date	None Identified To Date	None Identified To Date	None Identified To Date	None Identified To Date	None Identified to Date
# Corrosion Inspections Conducted	N/A	N/A	N/A	N/A	N/A	N/A	N/A
# Corrosion Defects Identified	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<u>Manhole Inspection/ROW</u>							
# Manholes in System	9,275	9,373	9,559	9,457	9,505	9,517	9,528
# Manholes Inspected during the Calendar Year	316	370	808	1,958	236	11	1,211
# Manholes Inspected since Program Began	4,513	4,883	5,691	6,471	7,885	7,896	9,107
# Manholes with Defects	93	184	582	(2)	160	10	388
<u>Flow Measurement (ADS)</u>							
Year of Most Recent Flow Monitoring	2010	2011	2012	2013	2014	2015	2016
Peak Flow Observed During Monitoring Period(gpd)	19,433,000	19,600,000	17,640,000	22,490,000	16,190,000	19,120,000	18,270,000
Instantaneous Peak Flow Observed(gpd)				24,824,000	18,983,000	21,198,000	20,150,000
Average Flow Observed during Monitoring Period(gpd)	6,209,000	7,250,000	7,547,000	7,654,000	6,534,000	6,868,000	6,129,000
Low Flow Observed during Monitoring Period(gpd)	836,000	240,000	4,630,000	4,101,000	4,003,000	3,902,000	3,693,000
List Basins that Contribute Flow to this Basin	See System Map	See System Map	See System Map	See System Map	See System Map	See System Map	See System Map
<u>CCTV Inspection (Contractor & Internal)</u>							
# Feet Inspected by CCTV this Calendar Year	115,548	126,264	252,622	348,108	148,549	117,880	319,630
# Feet Inspected since Program Began	1,097,345	1,223,609	1,476,231	1,445,453	1,972,888	2,090,768	2,410,398
# Feet Cleaned for Inspection	80,750	138,727	42,724	272,450	28,580	8,300	190,290
# Feet Cleaned for Routine or Scheduled Maintenance	40,852	56,210	54,153	32,015	68,328	60,424	57,713
# Defects Identified by CCTV Inspection	475	460	289	(2)	3,531	177	2,242
# Defects Catalogued or Recorded into Database	475	460	289	(2)	3,531	177	2,242

HALLSDALE- POWELL UTILITY DISTRICT - PERFORMANCE SPREADSHEET							
<u>Program/Performance Measures</u>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
Smoke Testing (Contractor & Internal)							
# Feet Smoke Tested this Year	80,750	137,845	237,021	394,198	32,657	0	275,814
# Leaks Identified on Public System	11	92	275	198	18	0	229
# Public System Leaks Repaired	107	36	148	0	9	0	0
# Public System Leaks Not Repaired This Year	0	56	127	198	9	0	229
# Public Leaks Not Repaired Since Program Began	162	218	345	360	369	369	598
# Leaks Identified on Private Service Connections	24	149	219	31	19	0	90
<u>Gravity Line Rehabilitation (Contractor & Internal)</u>							
# Feet Gravity Lines Rehabilitated	121,592	20,465	11,075	0	3,455	33418	0
# Feet Rehabilitated Since Program Began	159,757	180,222	191,297	191,297	194,752	228,170	228,170
# Feet Replaced	1,527	5,741	0	0	3,455	5497.5	0
# Feet Replaced Since Program Began	11,127	16,868	16,868	16,868	20,323	25,821	25,821
# Feet Sliplined	0	0	0	0	0	0	0
# Feet Sliplined Since Program Began	0	0	0	0	0	0	0
# Feet Cured in Place	117,905	14,724	10,295	0	0	27920	0
# Feet Cured in Place Since Program Began	156,070	170,794	181,089	181,089	181,089	209,009	209,009
# Manholes Rehabilitated	757	228	181	0	13	409	20
# Manholes Rehabilitated Since Program Began	1,090	1,318	1,499	1,090	1,103	1,512	1,532
# Manholes Replaced	1	23	0	0	20	19	0
# Manholes Replaced Since Program Began	47	70	70	70	90	109	109
# Feet of Gravity Line Rehabilitation Inspected	121,592	14,724	11,075	0	3,455	33,418	0
# Feet Of Gravity Line Rehabilitation Tested	6,100	5,741	0	0	3,455	5497.5	0
<u>Grease Program</u>							
# Facilities Identified for Inclusion in Grease Program	148	153	160	144	145	146	149
# Facilities with Installed Grease Devices	148	153	160	144	145	146	149
# Grease Installation Inspections Conducted and Documented	3	1	2		2	3	11
# Routine Grease Inspections	122	5	358	439	468	483	499
<u>Other Inspections</u>							
# Construction Inspections	7	7	8	6	6	8	9
# Pump Station Inspections	745	179	209	298	318	354	625
# Documented Pump Station Inspections	745	179	209	298	318	354	625
# Customer Owned Service Line (lateral) inspections	169	135	185	181	175	208	163
⁽¹⁾ Note this number may not be quantifiable in wet weather							
⁽²⁾ Final data numbers were not available as of the date this report was prepared							

Sewer Capital Improvements

Note: FY Begins April 1st and Ends March 31st

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Sewer Rehab Basin 1F/1G & other	4,000,000								\$ 4,000,000
Sewer Rehab Basin 9B & other		4,500,000							4,500,000
Sewer Rehab Phase 4		5,000,000							5,000,000
Sewer Rehab Phase 5			5,000,000						5,000,000
Sewer Rehab Phase 6				5,000,000					5,000,000
Sewer Rehab Phase 7					5,000,000				5,000,000
Sewer Rehab Phase 8						5,000,000			5,000,000
Sewer Rehab Phase 9							5,000,000		5,000,000
Sewer Rehab Phase 10								5,000,000	5,000,000
Beaver Creek Interceptor Replacement Phase 1 SRF	8,000,000	2,000,000							10,000,000
Beaver Creek Interceptor Replacement Phase 2		5,000,000	5,000,000						10,000,000
North Fork Interceptor Imp. Phase 2		600,000							600,000
West Emory Rd Sewer Realignment	700,000								700,000
Sharps Chapel Sewer System	100,000	100,000							200,000
Beaver Creek Interceptor from Central Ave to I-75	4,500,000								4,500,000
Beaver Creek WWTP Upgrades to future solids	-			5,000,000					5,000,000
Beaver Creek WWTP Eff. & RAS/WAS pump stations & SolidsSRF									-
Beaver Creek WWTP Upgrading to handle more Flow	-					7,000,000			7,000,000
Replace Step Systems w/ Grinder Pumps	10,000	10,000	10,000	10,000					40,000
Miscellaneous Sewer Line Extensions	100,000	100,000	100,000	100,000	100,000	200,000	200,000	300,000	1,200,000
Wastewater Pump Station Improvements	150,000	150,000	200,000						500,000
Sewer Equalization Storage Dry Gap									-
Sewer Equalization Storage Norris Freeway					9,000,000				9,000,000
Sewer Equalization Storage near I-75							11,000,000		11,000,000
Sewer Investigation	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	4,000,000
Campbell Point Pump Station Improvements	-								-
Yellow Brick Pump Station Improvements									-
Total Sewer Capital Improvements	\$ 18,060,000	\$ 17,960,000	\$ 10,810,000	\$ 10,610,000	\$ 14,600,000	\$ 12,700,000	\$ 16,700,000	\$ 5,800,000	\$ 107,240,000

2016 SSO Locations

Legend

SSO

WET_DRY

● Dry

● Wet

→ Collector, HPUD

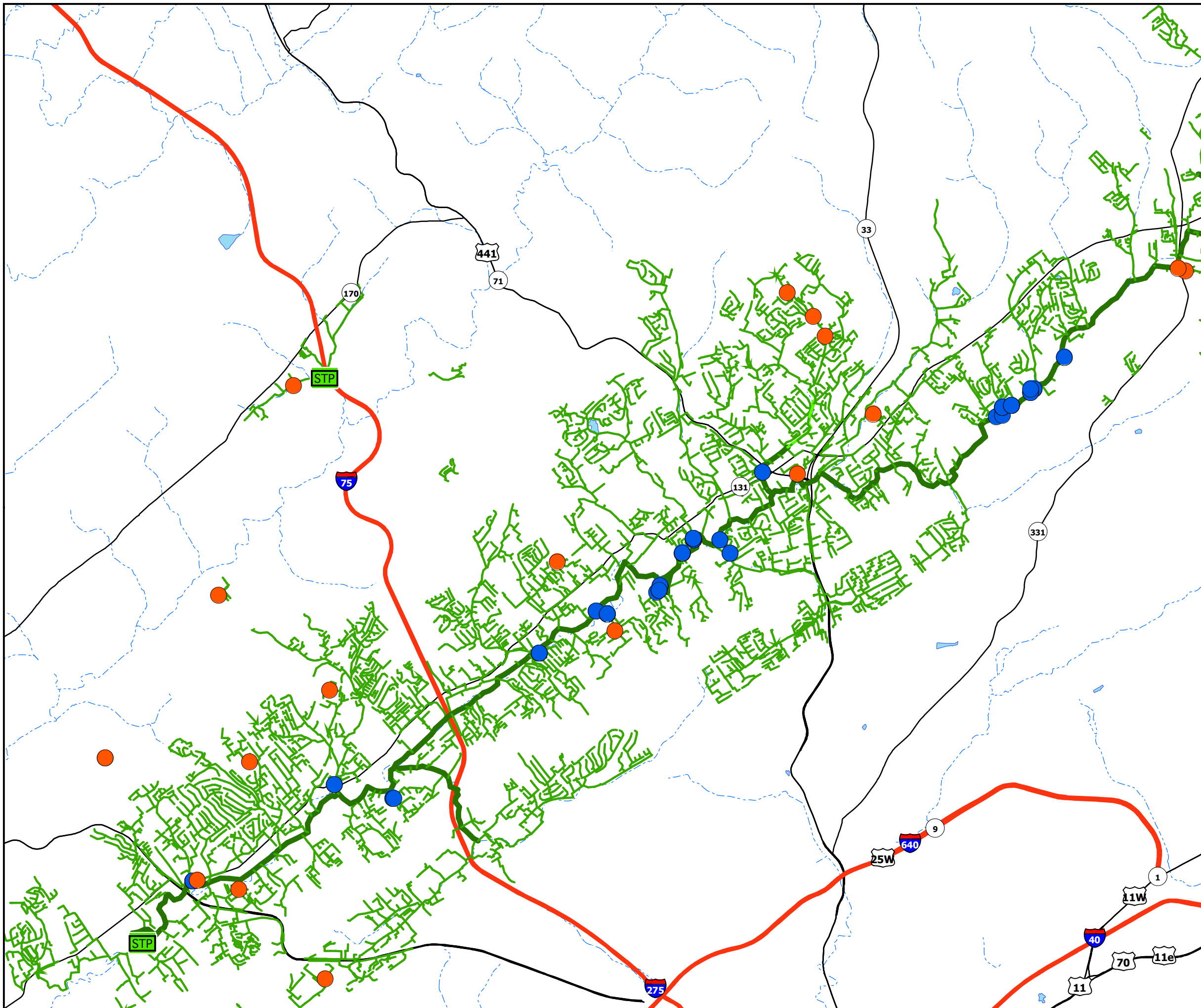
→ Inline Storage, HPUD

→ Interceptor, HPUD

→ Collector, Private

N












0 0.5 1 2
Miles

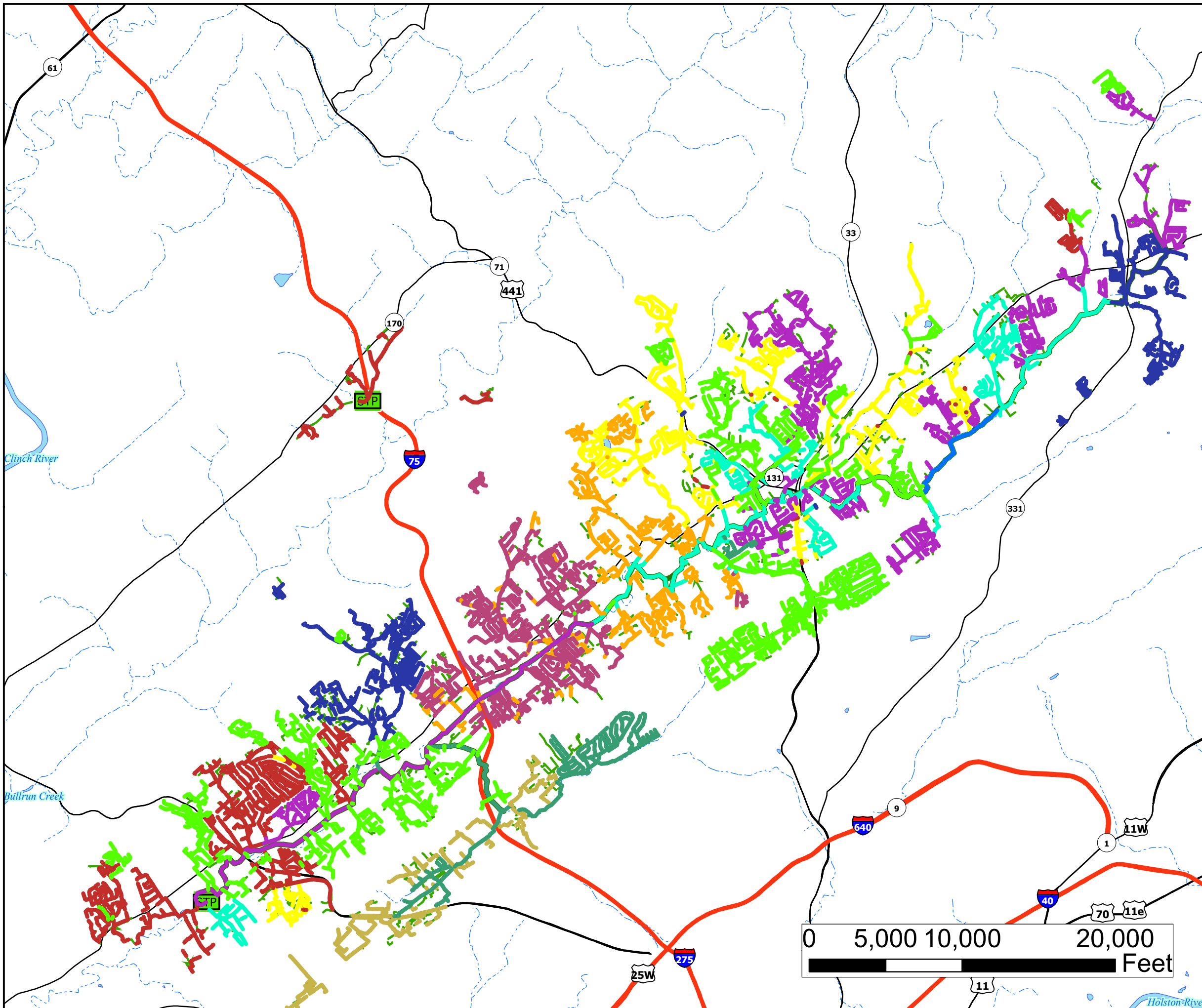


Legend

**CCTV
Inspections by
Year**

YEAR

-  2006
-  2007
-  2008
-  2009
-  2010
-  2011
-  2012
-  2013
-  2014
-  2015
-  2016



2016 PMI Sewer Line Inspections

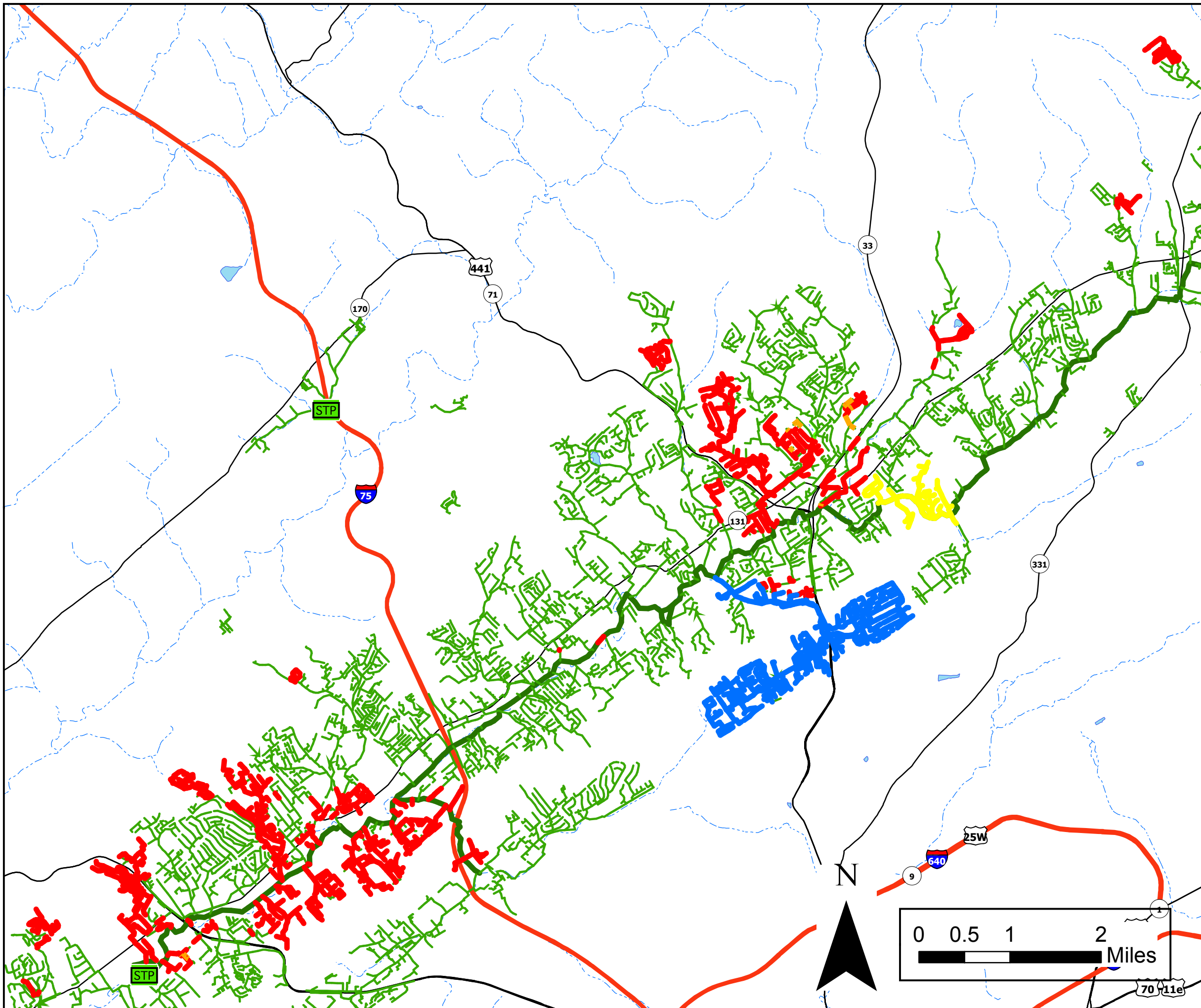
Legend

2016 CCTV/Smoke Test Lines Phase

- 1
- 1A
- 2
- 3
- Collector, HPUD
- Inline Storage, HPUD
- Interceptor, HPUD
- Collector, Private

2016 PMI CCTV/SmokeTest Notes:

- * Phase 1 and 1A are incorporated in the original contract- Completion of the System
- * Phase 2 and 3 are incorporated in the additional scope added to the contract- HP08 & HP06



2016 PMI Manhole Inspections

Legend

2016 PMI Manholes

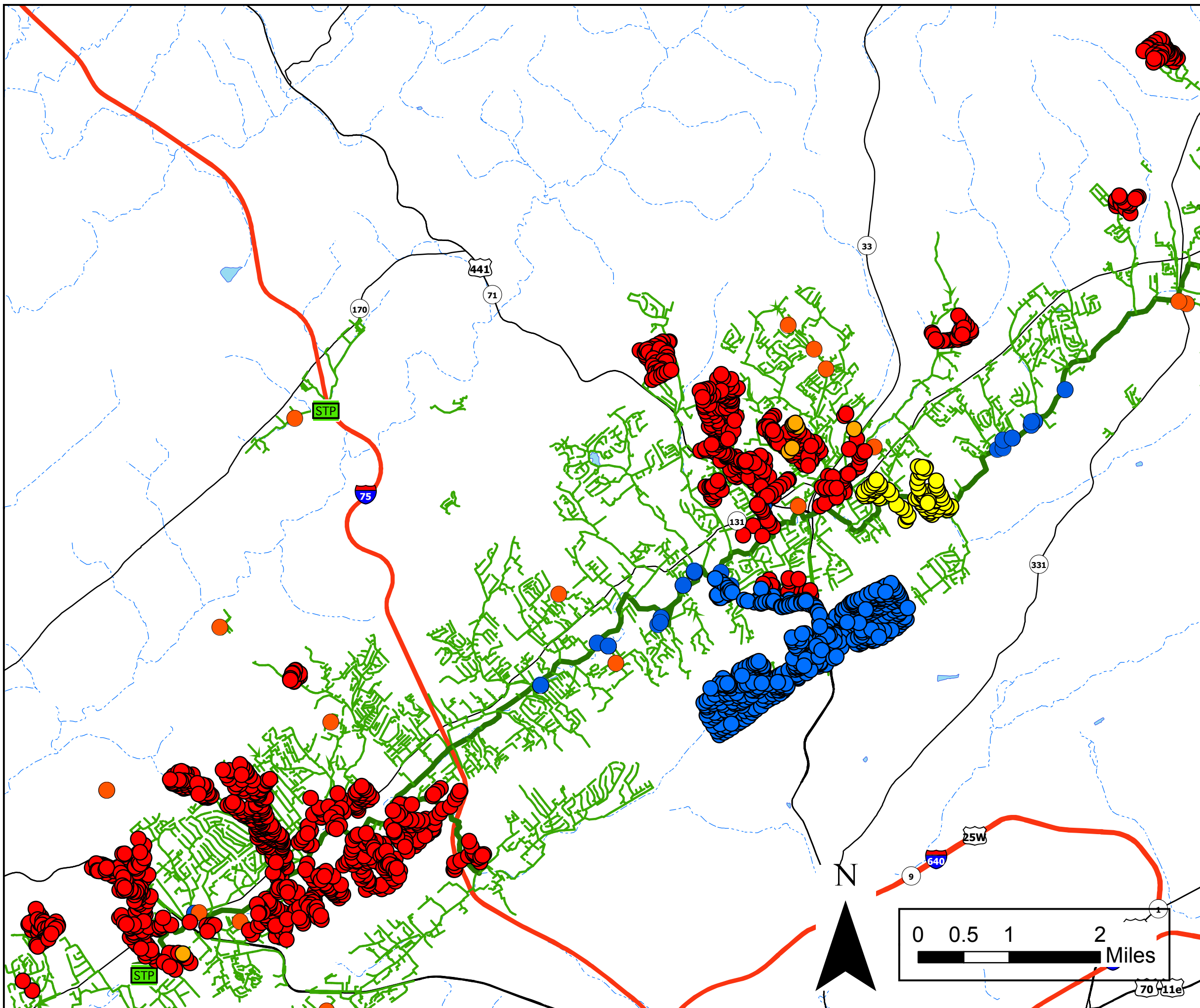
Phase

- 1
- 1A
- 2
- 3

- Collector, HPUD
- Inline Storage, HPUD
- Interceptor, HPUD
- Collector, Private

2016 PMI Manhole Notes:

- * Phase 1 and 1A are incorporated in the original contract- Completion of the System
- * Phase 2 and 3 are incorporated in the additonal scope added to the contract- HP08 & HP06



SECTION 1.0 - 2016 CMOM PROGRAM SUMMARY

A. Certification Statement

This 2016 Annual Report is submitted to fulfill the requirements of Hallsdale-Powell Utility District's (HPUD's) Consent Order #WPC-14-0044 as agreed upon in August 2014. This Consent Order is a legal agreement between the Tennessee Department of Environment & Conservation (TDEC) and HPUD. The purpose of the Consent Order is to address sanitary sewer overflows (SSOs) in the HPUD sanitary sewer system in an effort to improve water quality throughout HPUD service area. In accordance with the 2014 Consent Order, this report details the results of activities undertaken during the annual reporting period beginning January 1, 2016 and ending December 31, 2016.

The format of this report will follow the outline presented within the table of contents and is presented in response to the information requested in the Consent Order. All pertinent and supplemental data, maps and background documentation will be retained on file in the main office located at 3745 Cunningham Drive, Knoxville, Tennessee and is available upon request.


Signature

3-30-2017
Date