



## Town of Pittsboro, North Carolina

Engineering Department

### Memorandum

To: Mayor Cindy Perry and the Town Board of Commissioners

From: Fred Royal, PE, Town Engineer 

Re: Sanitary Sewer Collection System Asset Management Plan (Resolution Required)

Date: May 23, 2016

### Background

As described in previous memoranda to the Board of Commissioners, The Town is in the initial stages of the development of a *Sanitary Sewer Asset Management Plan and Prioritization Tool*, being developed by WK Dickson. This will be a dynamic plan and tool to assist staff with rehabilitation/replacement prioritization and consistent Capital Improvement Program project generation for each fiscal years budget. Prioritization has initially been limited to the current loan application project area however, it will be expandable to more of the Town's gravity sewer collection system as funds are made available. Currently, our GIS inventory data is being imported into the database and is under review for completeness and accuracy. The Town has previously invested in this GIS inventory. Now we can put this inventory investment to proactive use.

The Asset Management Plan and Prioritization Tool will utilize GIS and GPS digital technology. Staff will require training and budgets for software and hardware that will be required. We believe that investments in this plan and tool will greatly assist with reducing the costly wet weather flows at the WWTP. Once developed and implemented, it will provide the Town with valuable cost and benefit information for sewer rehabilitation decision-making. It will also assist staff with developing annual Capital Improvement Program budgets for sewer rehabilitation and it will provide the Town with additional points in any future grant and loan applications to the State Revolving Loan Fund program.

Below is a summarized list of the project purpose and elements:

- Reduce total phosphorus (TP) limits to Robeson Creek
- Reduce total nitrogen (TN) limits to Jordan Lake
- Reduce wet weather flows entering the WWTP
- Stabilize reclaimed water treatment and sales to 3M and develop expanded sales/uses
- Minimize operational costs associated with emergency procedures at the WWTP
- Develop a more efficient method to assess and carry out system rehabilitation with the annual CIP budget process

### Discussion

The greatest challenge that Pittsboro faces in its wastewater system are substantial wet weather flows that are driven by inflow and infiltration (I&I) in the collection system. The peak wastewater flows that occur during rain events severely impact the capacity at the wastewater treatment plant (WWTP) as well as in the collection system. The WWTP and current discharge to Roberson Creek are permitted for 0.75 million gallons per day (MGD), and the plant sells reclaimed water to a large industrial customer in the system. However, peak wet weather flows at the facility can reach 1.4 MGD with regularity. These peak flows require the town to bypass the filters at the WWTP in order to avoid overflows at that facility and the system can experience sewer overflows in the collection system. When the filters are bypassed, the plant cannot meet reclaimed water quality standards and therefore cannot sell that water to customers in the system. In the past two years, WWTP operators have by-passed the filters on 25 days during 11 storm events that produced I&I to completely overwhelm the plant. These excess flows also take up valuable treatment capacity at the WWTP that is needed to serve new growth in the community. The I&I coming from the collection system creates consistent operational and financial challenges in both the collection system and at the WWTP. Reducing wet weather flows will also require less treatment capacity, which is currently nearing current allocation capacity. In other words, the Town can “stretch out” allocation availability with less inflow and infiltration.

The second significant challenge is the age and condition of the collection system components. While the town has worked to address I&I over the last 10 years, some sections are so antiquated that the Town still doesn't know the condition of the lines and manholes. The most recent condition assessment project, performed in January 2016, determined that critical information on the size and material of the pipes and manholes that were located from field conditions which differed from the information that was shown in the GIS database. Pittsboro's collection system includes 32 miles of gravity sewer ranging in size from 6 inches to 15 inches in diameter, 759 manholes and approximately 4 miles of force mains that range in diameter from 3 inches to 6 inches. Based on analysis performed by consultants for the Town, the poor condition of the

collection system contributes approximately 550,000 gallons of inflow for every inch of rainfall that occurs. This is not only limiting the available capacity at the WWTP, this excess flow is also consuming critical flow capacity that is needed in the collection system itself. Previous master plans prepared by the Town noted capacity limitations and concerns in the primary outfall and force mains in the system. With limited funding available for improvements in the system, Pittsboro needs to be able to carefully and precisely prioritize the improvements in the collection system that can provide the greatest reduction in I&I in the immediate future and over time while providing the flow capacity needed to allow for rapid growth in the community.

Pittsboro needs to continue to enhance its asset management processes and tools so that it can maximize its operations, maintenance and capital investment to effectively incorporate this growth and ensure that the existing collection and treatment systems can accommodate it safely. This Asset Management Plan project (if funded) will establish tools and process that can help to automate the process of prioritizing operations, maintenance and capital spending focus, making it easier for Town staff to repair and improve the wastewater system while maximizing the sanitary sewer allocation pool needed to allow for new development applications to continue.

### **Asset Management Planning**

In February 2016, the Town completed additional efforts to effectively plan for needed improvements in the wastewater system. It completed a Priority Sewer Rehabilitation Project, funded by the Division of Water Quality that evaluated a portion of the system to identify primary sources of I&I for improvements. This \$495,000 loan project has been approved for bidding and construction/rehabilitation. Bid advertising will take place immediately with construction/rehabilitation anticipated in July-August, 2016.

The Town also completed the first phase of the development of a non-proprietary GIS-based Asset Prioritization Tool. The Prioritization Tool, developed and operated within the Town's GIS asset inventory, will serve to continuously assess the criticality (risk) of the components of the collection system, evaluating each asset's capacity, condition and consequence of failure (the three C's). The first phase of the Tool involved developing a toolbox for the Town that utilizes just a few initial asset attributes to evaluate the "three C's" for each asset in the collection system. Pittsboro will utilize the results of the Prioritization Tool as it becomes fully developed to prioritize condition assessment, operations and maintenance activities, rehabilitation, repair and replacement of the most critical assets.

### **Next Steps: Grant Application**

Pittsboro has identified an internal asset management team that will include WK Dickson in the completion of this asset inventory, condition assessment and asset management programming project. More importantly, this staff will oversee the on-going data collection and inventory management, project prioritization, CIP development and utility

rate input going forward. As the Town has already taken some initial steps towards more effective asset management and enhanced CIP development, this team has demonstrated that it is fully committed to a process of completing this initial project in a manner that creates a sustainable process for identifying and tackling its wastewater challenges on an on-going basis. As this initial project is completed, items such as checklists, procedures and processes will be identified in order to maintain the information and inventory as a part of the daily routine activities that the Town staff performs.

**Grant Summary:**

- 12-month process
- Total Budget: \$180,000
- NCDEQ Funds Provided: \$150,000
- Town of Pittsboro match: \$30,000
- FY 16-17 budget request

This grant has been applied for without the Town's financial commitment. The attached Resolution would complete the grant application.

**Staff Recommendations**

Staff recommends that the Town of Pittsboro Board of Commissioners (BOC) adopts the attached Resolution in order to qualify for consideration for the grant funds.