

ENGINEERING REPORT
FOR
CONSENT ORDER 08-010-CWP

FOR
THE CITY OF TALLADEGA, AL

JANUARY 2008

KREBS ARCHITECTURE & ENGINEERING, INC.
2100 RIVER HAVEN DRIVE
BIRMINGHAM, ALABAMA 35244
(205) 987-7411

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I. OVERVIEW

- A. The purpose of this report is to address the requirements of Consent Order No. 08-010-CWP dated October 18, 2007. The consent order outlines certain treatment plant discharge violations which occurred between November 2005 and October 2006, and wastewater collection system violations (SSO's) which occurred between January 2006 and March 2007 (see Appendix I).
- B. The consent order has the following requirements:
 - 1. Payment of a civil penalty
 - 2. Preparation of a comprehensive engineering report, to include:
 - a. Identification of all potential causes of non-compliance
 - b. A summary of changes necessary to achieve compliance with NPDES Permit ALO022357
 - c. A schedule for implementation

II. EXISTING FACILITIES

- A. The City of Talladega (formerly operating as the Water & Sewer Board) owns and operates a wastewater treatment plant, known as the Main Plant, located northwest of the city at 601 Alabama Highway 275. The Main Treatment Plant was originally constructed in 1965 and upgraded in 1983, 1989 and 2006. The plant has a design flow rate of 4.0 million gallons per day (MGD). The plant is a trickling filter plant utilizing influent pumping, grit removal, primary and final clarification, effluent micro-screening, nitrification towers, anaerobic digestion and disinfection via chlorination/dechlorination. The micro-screens and nitrification towers were added in the 1989 upgrade; however, due to operational issues, they were temporarily removed from service between July 2004 and approximately October 2006.
- B. The wastewater collection system consists of approximately 85 miles of sanitary sewer line, 1600 manholes and 10 pump stations. The sewer lines range in size from 4" to 30" in diameter. The most common sewer line size is 8".

III. TREATMENT PLANT UPGRADE

A. In November 2006, a plant upgrade was completed and placed on-line. The improvements are described as follows:

1. Replacement of the existing influent pumps and addition of a third pump
2. Replacement of existing grit pump
3. Refurbishment of second grit basin and addition of grit pump and classifier
4. Replacement of trickling filter distributors (both trickling filters)
5. Replacement of nitrification tower media and ventilation blowers (both towers)
6. Replacement of micro-screen control panels
7. Replacement of digester gas piping

B. These improvements have resulted in the following benefits:

1. Additional influent pumping capacity to handle peak flows
2. Improved grit removal with addition of redundant basin
3. Improved influent distribution at trickling filters with new distributors
4. Enhanced nitrification and increased BOD/TSS removal with the return to service of the micro-screens and nitrification towers
5. Full compliance with NPDES discharge permit limitations

IV. SOURCES OF VIOLATIONS

A. Treatment Plant

1. The CBOD₅, NH₃-N, and fecal coliform violations occurring from November 2005 through October 2006 (Appendix I) were a direct result of failing trickling filter equipment and the fact that the micro-screens and nitrification towers were out of service.
2. Overflows at the treatment plant which occurred from January of 2006 through October 2006 (Appendix I) resulted from significant rain fall events and construction activities relating to upgrade of the influent lift station. These overflows were due to insufficient pumping capacity at the lift station.

B.. Collection System

1. Following is a listing of collection system SSO's for 2007 and their causes:

<u>SSO Event</u>	<u>Location</u>	<u>Cause</u>
Manhole overflow	302 Welch Avenue	Main line blockage
Manhole overflow	619 Neff Avenue	Blockage due to grease
Manhole overflow	Marshall Street	Service line blockage
Sewer overflow	803 Coffee Street	Broken cleanout
Sewer overflow	508 Coffee Street	Service line blockage
Sewer overflow	807 Coffee Street	Service line blockage
Manhole overflow	Coffee & East Street	Main line blockage
Sewer overflow	Campbell's Barbeque	Main line blockage
Sewer overflow	810 Nimitz Avenue	Main line blockage
Manhole overflow	Curry Court Apt	Main line blockage
Manhole overflow	18th Street	Main line blockage
Sewer overflow	East Battle Street	Broken cleanout
Lift station overflow	Shocco Springs	Defective valve
Lift station overflow	Shocco Springs	Defective level detector
Sewer overflow	Pulliam & Dial Street	Broken service line
Manhole overflow	East McMillan Street	Main line blockage
Manhole overflow	500 McMillan Street	Main line blockage

The majority of SSO's during 2007 were due to main line blockage caused by grease buildup in the sewer. Two of the overflows were caused by deficiencies at the Shocco Springs Lift Station. Other overflows were the result of physical damage to cleanouts.

V. CHANGES NEEDED TO ACHIEVE COMPLIANCE

A. Treatment Plant

1. The 2006 treatment plant upgrade, during which the trickling filter equipment was replaced and the micro-screens and nitrification towers were placed into service, has addressed the primary deficiencies which led to the 2005 and 2006 permit violations. Additionally, in 2007, approximately \$30,000 was expended to replace sludge pumps, piping and valves to improve the plant's sludge handling capability.

2. As a part of the upgrade, the influent pump station was expanded to handle peak flows and prevent future overflows at the plant. The existing pumps were replaced; and a third pump was added. This upgraded the pump station capacity to approximately 12 MGD. Appendix II shows flow data since September 2006.
3. As indicated above, no discharge permit violations have occurred since completion of the plant upgrade. The influent lift station has been upgraded to handle peak flows. Therefore, no treatment plant modifications are recommended.
4. Since the NPDES permit limits are more stringent than secondary, the City has requested that the % removal requirement for CBOD be removed.
5. Current treatment plant operating and maintenance procedures are sufficient for maintaining permit compliance. Selective replacement of aging equipment prior to failure should continue. An additional certified operator has been hired to help staff the plant.

B. Collection System Rehabilitation

1. In order to identify areas of the collection system needing repair and rehabilitation, the City has established a program to video inspect the sewer lines in the main collection system. An annual budget of \$300,000 has been set aside for repairs of identified deficiencies. This effort will be part of an ongoing, systematic program designed to repair deteriorated infrastructure and reduce infiltration and inflow (I/I), as follows:
 - a. Utilizing the City's video inspection truck, document lines which are noted to have defects including cracked or broken pipe, mis-aligned joints, root intrusion, etc..
 - b. Perform repairs on all lines which exhibit significant defects. Repairs should include, but not be limited to, manhole rehabilitation, line replacement, pipe lining and/or point repairs.
 - c. Work should begin with the trunk sewer at the Main Wastewater Plant and proceed upstream into the remainder of the main collection system.

C. Lift Station Improvements

1. The Shocco Springs lift station is located at the intersection of Alabama Highway 275 and Howard Street. As noted above, the station has been the source of several SSO's, due to either grease buildup on the wet well level detector, valve malfunction or power failures.
2. To address these problems at the lift station, the following improvements should be implemented:
 - a. Install a telemetry system to remotely monitor the lift station. Installation should include new level detection equipment and auto-dialer with 24 hour alarm notification.
 - b. Replace the existing stand-by power generator at the Big Bemiston lift station with a new one and relocate the existing generator to the Shocco Springs lift station to provide continuous lift station operation in the event of a power failure.

D. Collection System Maintenance

1. Many of the SSO's listed in the consent order were due to blockages caused by a buildup of fats, oils and grease (FOG) in the collection system. The City currently has a grease trap ordinance (Appendix III) in place requiring installation of a grease interceptor at all public food preparation facilities. The ordinance does not establish permit fees or specific maintenance requirements.
2. A comprehensive FOG ordinance should be adopted to address the SSO problem. The City is currently evaluating an ordinance similar to that in place in Jefferson County. The ordinance should include the following features:
 - a. Annual permit fees
 - b. Minimum grease trap requirements
 - c. Specific grease trap maintenance requirements including:
 - (1) Maximum grease content
 - (2) Pumping schedule
 - (3) Record keeping
 - (4) Inspection
 - d. Enforcement mechanisms

3. Adoption of such an ordinance will help minimize the occurrence of line blockage caused by a buildup of FOG.

VI. Implementation Schedule

- A. Following is an implementation schedule for the improvements recommended above:

ITEM	BEGIN	COMPLETE
System Rehabilitation	February 2008	Annual Commitment
Adoption of a FOG Ordinance	January 2008	2008
Shocco Springs Lift Station Telemetry	February 2008	April 2008
Shocco Springs Lift Station Standby Power	April 2008	May 2008