City of Goldsboro
Water Reclamation Facility

Performance Annual Report

July 2015 to June 2016

Performance Annual Report

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Performance Annual Report

General Information:

Date: **July 2015 to June 2016**

Facility/System Name:
City of Goldsboro Water ReclamationFacility

Responsible Entity:
Karen Brashear/ Public Utilities Director

Operator in Responsible Charge/Contact:
Robert Sherman/Superintendent

Applicable Permits:
NC0023949

WQ0017791

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Description of City of Goldsboro Water Reclamation Facility: (Outfall 001)

Wastewater is routed through the mechanical filter screen at the Westbrook Road Pump Station. Large solids in the flow are caught on the screen, and are automatically raked off into a screw conveyor. The conveyor dewaters the solids as they are discharged into a dumpster adjacent to the structure. The solids are hauled from the pump station on a regular basis for disposal at the landfill.

Wastewater is pumped to the treatment plant from Westbrook Road Pump Station and is discharged into the Influent Structure. The influent flow is measured through a Parshall flume with flow rate indicated on the local instrument panel. The flow rate signal is transmitted to the SCADA system in the WRF Operations Building.

In case of high influent flows, part or all of the influent flow can be diverted from the Influent Structure and be diverted to Equalization Pond No. 1 for temporary storage. Opening the equalization gate allows control of the amount of flow temporarily diverted to the equalization pond. Once influent flows return to normal, stored wastewater is returned to the Influent Structure by operation of the Equalization Pond Pumps.

A concrete diverter separates the influent flow from the Parshall flume and the influent weirs equally into two grit chambers. The grit chambers are aerated, creating a turbulence that keeps organic matter in suspension while allowing heavier inorganic matter to settle to the bottom of the tank. The heavier solids (sand, coffee grounds, cinders etc.) are pumped by airlift to Equalization Pond # 1 for disposal. The removal of grit helps reduce wear on downstream process units caused by the abrasive nature of the material removed.

The wastewater then flows through four smaller Parshall flumes, which evenly separates the flow to the four Aerator/Clarifier Splitter Boxes, located adjacent to the Aeration/ Clarifier Basins. Depending on which particular process is being utilized, fiberglass stop plates in the Aeration/Clarifier Basin/Clarifier Splitter Boxes are used to split the flow and discharge into three different areas of the Aeration Basin. These areas are designated as Main Channel Aeration Zone, Main Channel Anoxic Zone, and BPR Chambers. These areas are controlled to create Aerobic, Anoxic, or Anaerobic environments.

A diffused air system is utilized for transferring oxygen to the wastewater. Networks of membrane diffusers are installed within the main aeration channel. When air is diffused through the network, millions of tiny air bubbles rise to the surface and transfer oxygen to contents of the tank.

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The Biological Phosphorus Removal (BPR) process was developed to remove phosphorus through modifying environmental conditions in biological treatment systems. BPR is accomplished by exposing organisms in the system to control anaerobic, anoxic, and aerobic conditions in a manner that enhances growth of the types of organisms capable of storing large amounts of phosphorus in their cells. Subsequent removal of those cells from the wastewater also removes the stored phosphorus and can produce low concentrations of that element in the wastewater, without resorting to chemical treatment.

The Biological Nitrogen Removal process also takes place in the Aeration basins. This process works hand in hand with the Biological Phosphorus Removal process. This is accomplished by exposing the organisms to aerobic and anoxic conditions in the Aeration basins, which promotes Nitrification and Denitrification, which in turn removes the Nitrogen from the wastewater.

The Aeration basins discharge to a Clarifier influent control box and then from the control box to the center of the Clarifier basin. As the wastewater flows toward the Clarifier effluent weirs, the solids in the flow settle to the bottom of the tank. The Clarifier liquid flows over the effluent weirs for discharge to the Effluent Control Box. The settled sludge is removed from the Clarifiers by hydraulic differential created by RAS Pump Station. A portion of the activated sludge is returned to the aeration basins and the remaining portion is removed from the system as waste activated sludge (WAS). WAS is wasted to a one million gallon (MG) Biosolids Storage Tank prior to dewatering and composting the dewatered biosolids with chipped vegetative waste creating a "Class A Exceptional Quality" compost.

The Clarifier wastewater flows to the Traveling Bridge Sand Filter from the Clarifier Effluent. The Sand Filter is a continuous rapid-rate down flow gravity filter. This type of sand media filter enhances solids removal, reduces turbidity, removes chemical precipitate, reduces toxic chemicals and reduces BOD, COD, and TOC related to suspended solids. The influent floods the filter bed via the multiple inlet ports from the influent channel. The influent flows downward through the granular media and porous plates. Filtrate passes through the effluent/backwash port and into the channel. A traveling bridge contains and supports the backwash hood, which moves across the filter bed and automatically backwashes each cell while the remaining cells continue filtering the influent.

The filter effluent bypasses the existing chlorine contact chamber and is disinfected with ultraviolet light. (Sodium Hypochlorite and Sodium Biosulfite are used as an emergency back-up for disinfection and dechlorination if ever the ultraviolate light system fails). The disinfected effluent then passes through a Parshall flume and a cascade step aerator, then it is discharged by gravity to the Neuse River at Pipe 001. An effluent flood pump station pumps to the Neuse River during high plant and river flow conditions.

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Reclaimed Water and Constructed Wetlands (Outfall 002)

The City of Goldsboro operates a water reclamation facility for treating wastewater with a permit to discharge treated effluent directly to the Neuse River. In an effort to reduce the amount of nutrients discharged to the river, the City has initiated projects finding alternate uses for the highly treated effluent from the WRF.

A Reclaimed Water (non-potable) Pump Station pumps reclaimed water for three separate uses; for wash water on the belt filter presses in the Dewatering Building, for irrigation purposes, and to the constructed wetlands. After the reclaimed water is used to clean belt filter press, it is returned to the head of the plant for more treatment. Some of the reclaimed water is pumped to an off-site storage tank for irrigation of the city's golf course and to 114-acres of farmlands producing hay. There is also a portion of reclaimed water that is sent to 40-acres of constructed wetlands for further "polishing" treatment through a series of cells containing aquatic plants. The effluent from the constructed wetlands is discharged back to the river at Pipe 002. All reclaimed water receives ultraviolet light disinfection and chlorine for disinfection. The constructed wetlands effluent is de-chlorinated with Sodium Bisulfate prior to discharge.

Wastewater Pump Stations

The City has twenty-six (26) wastewater pump stations to pump wastewater collected by gravity sewer lines throughout the City of Goldsboro to the Water Reclamation Facility for treatment. These pump stations consist of motors, pumps, and pump controls. When wet wells begin to fill with wastewater, the pump controls turn the pumps on to move the wastewater towards the Water Reclamation Facility. All city pump stations are monitored from the Water Reclamation Facility by a telemetry system or by dialer system.

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Performance: (July 1, 2015 to June 30, 2016)

Pipe 001 (WRF) Utilization System	Pipe 002 (Constructed Wetlands)	Reclaimed Wastewater
July 2015 Compliant	July 2015 Compliant	July 2015 Compliant
August 2015 Compliant	August 2015 Compliant	August 2015 Compliant
September 2015 Compliant	September 2015 Compliant	September 2015 Compliant
October 2015 Compliant	October 2015 Compliant	October 2015 Compliant
November 2015 Compliant	November 2015 Compliant	November 2015 Compliant
December 2015 Compliant	December 2015 Compliant	December 2015 Compliant
January 2016 Compliant	January 2016 Compliant	January 2016 Compliant
February 2016 Noncompliant	February 2016 Compliant	February 2016 Compliant
March 2016 Compliant	March 2016 Compliant	March 2016 Compliant
April 2016 Compliant	April 2016 Compliant	April 2016 Compliant
May 2016 Compliant	May 2016 Compliant	May 2016 Compliant
June 2016 Compliant	June 2016 Compliant	June 2016 Compliant

Pipe 001
City of Goldsboro Water Reclamation Facility-Noncompliant Pipe 001-February 2016, Monthly Flow average was 16.23mgd (Limit 14.2mgd). During the month of February 2016, the City of Goldsboro Water Reclamation Facility received a total of 7.35 inches of rain which caused extremely high flows coming to the plant

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Notification:

The Performance Annual Report for the Water Reclamation Facility along with the Performance Annual Report for the Collection System will be made available to the public at the Public Works Complex office and at the City of Goldsboro Water Reclamation Facility. The City is notifying citizens of the availability of these Performance Annual Reports by sending a printed message on the water bills. In addition, the Performance Annual Report is available on the City website.

Performance Annual Report

Certification:

I certify under penalty of law that this report is complete and accurate to the best of my knowledge. I further certify that this report has been made available to the users or customers of the named system and that those users have been notified of its availability.

Robert P Sherman

Robert Sherman
Responsible Person in Charge
Superintendent
City of Goldsboro Water Reclamation Facility

7-25-2016
Date

City of Goldsboro
P.O. Drawer A
North Carolina
27533-9701

Performance Annual Report

I. General Information

Facility/System Name: City of Goldsboro Sanitary Sewer Collection System
Responsible Entity: City of Goldsboro- Jose F. Martinez III, Public Works Director
Person in Charge/Contact: Donald McMullen
Applicable Permit(s): Goldsboro Waste Treatment – NC0023949;
Collection Permit – WQCS 00023

Description of Collection System or Treatment Process:

Gravity Flow Collection System

II. Performance

Text Summary of System Performance, July 1, 2015 to June 30, 2016

There were two (2) reportable sanitary sewer discharge and zero (0) non-reportable sanitary sewer discharge during the period of July 1, 2015 to June 30, 2016.

List (by month) any violations of the permit conditions or other environmental regulations. Monthly list should include discussion of any environmental impacts and corrective measures taken to address the violations.

On **November 23, 2015** at 500 E Holly Street, a reportable spill occurred due to a grease blockage resulting in ~150 gallons of sewage getting into the Big Ditch. The area was cleaned up and samples taken downstream. No environmental impacts were noted.

On **February 8, 2016** at the intersection of Marvin St and Olivia Lane, a reportable spill occurred due to heavy rainfall resulting in ~300 gallons of sewage getting into the Big Ditch. The area was cleaned up and downstream samples taken. No environmental impacts were noted.

City of Goldsboro
P.O. Drawer A
North Carolina
27533-9701

III. Notification

State how this reports has been made available to availability users or customers of the system and how those users have been notified of its availability.

The following notice was printed on customer's utility billings:

The Sanitary sewer annual performance report may be viewed at the City of Goldsboro Public Works Department, 1601 N. Clingman St., Phone 734-8674, and at our website, www.GoldsboroNC.gov.

IV. Certification

I certify under penalty of law that this report is complete and accurate to the best of my knowledge. I further certify that this report has been made available to users or customers of the named system and that those users have been notified of its availability.

Donald McMullen — 7-27-16

Responsible Person — Date

Donald McMullen

Title: Distribution & Collections System Superintendent

Entity: City of Goldsboro