City of Clinton: Wastewater Systems
Annual Performance Report

January 2015 through December 2015

I. General Information

Facility/System Name:	City of Clinton Collection System and Norman H. Larkins Wastewater Publicly Owned Treatment Works
Responsible Entity:	Jeff Vreugdenhil, Director Public Works and Utilities
Person(s) in Charge/Contact:	Jeff Vreugdenhil, Director Public Works and Utilities Neil D. Carroll, Wastewater Treatment Manager Michael Christopher Medlin, Utilities Superintendent Lisa Osthues, Environmental Programs Manager
Applicable Permit(s):	Collection System Permit WQCS00079 NPDES Discharge Permit NC0020117 Land Application Permit WQ0002890

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II. Collection System and Treatment Process Description

A. Collection System

The City of Clinton maintains approximately 91 miles of wastewater collection lines with 14 lift major stations, 61 simplex lift stations, 1612 manholes, and approximately 3,550 connections. The Collection System is staffed by ten (10) full time state certified personnel, led by the City's state certified Utilities Superintendent and Operator in Responsible Charge. The Collection System staff is responsible for the routine required inspection, maintenance and cleaning, as well as repair and upgrading of the collection lines, manholes, connections and simplex lift stations.

The Collection System is permitted by the state, and must adhere to state permit requirements. The system's use is regulated by the City's Sewer Use Ordinance, Chapter 22, Article V. Sewers, of the City of Clinton Code of Ordinances. The ordinance includes provisions for domestic and industrial users, as well as restrictions and requirements for treating wastewater prior to disposal in the City's Collection System with devices such as grease traps, or sand filters.

B. Wastewater Treatment Plant

The Collection System discharges to the Norman H. Larkins Wastewater Treatment Plant. The treatment plant is staffed by five (5) certified full time Wastewater Operators, a Certified Maintenance Technologist, an Environmental Programs Assistant / Backup Laboratory Analyst, a Certified Laboratory Analyst, the Chief Wastewater Operator, the Environmental Programs Manager / Laboratory Supervisor, and the Operator in Responsible Charge / Wastewater Treatment Manager. The Operator staff and the Utility Maintenance Tech are also responsible for the operation and maintenance of the City's fourteen (14) duplex lift stations.

The plant is permitted by the state to treat five (5) million gallons of wastewater per day by tertiary biological methods. Following mechanical separation of solids and biological treatment, the treated wastewater is filtered, disinfected, and received by the Williams Old Mill Branch which enters the Great Coharie Creek of the Cape Fear River Basin. Wasted biosolids are aerobically digested and recycled through a land application program which is managed per North Carolina and EPA regulations. The on-site Wastewater Laboratory monitors the incoming wastewater (influent), in-process water and biosolids, and outgoing water (effluent) and biosolids routinely to ensure the treatment processes are successful and that the water and biosolids adhere to state and federal standards. Additionally, the City is a member of the Lower Cape Fear River Program, and up and downstream monitoring is conducted via this program on behalf of the City.

The Environmental Programs Manager administers a state approved Pretreatment Program, which is required for any POTW to accept wastewater from any significant industrial user. The goals of the Pretreatment Program are to protect the waters of the state by preventing pollutant pass-thru of the treatment facility, prevent interference with the wastewater treatment process, promote beneficial use of treated biosolids, and to protect the worker and the public health. These goals are accomplished through a program of cooperation between the POTW and the industrial users in which the industries maintain wastewater treatment operations in situ to reduce the amount of pollution in the influent of the wastewater treatment facility. The POTW helps the industries maintain a state of compliance through the issuance of Industrial User Permits, enforcement response, regular communication and inspections and sampling.

III. Safety

For the calendar year of 2015, the City of Clinton Public Works and Utilities, Water and Sewer Division, as well as the Wastewater Treatment Division both received Certificates of Safety Achievement from the NC Department of Labor. The certificates are awarded in recognition of the outstanding safety and health efforts of each division that resulted in a substantial reduction of injuries and illnesses, and the promotion of safer working conditions for that year. The Water and Sewer Division received their First Year Silver Certificate, and the Wastewater Treatment Division received their Third Year Gold Certificate.

IV. Certifications

A. Collection System

For the calendar year of 2015, the City of Clinton Collection System employees earned or maintained the following certifications:

- All staff maintained existing certifications.
- Three staff members earned his/her Collection Systems Operator Grade II Certification.

B. Wastewater Treatment

For the calendar year of 2015, the City of Clinton Wastewater Treatment Plant employees earned or maintained the following certifications:

- All staff maintained existing certifications.
- One staff member earned his/her Biological Wastewater Operator Grade II Certification.
- One staff member earned his/her Collection Systems Operator Grade II Certification.
- One staff member earned his/her Collection System Operator Grade III Certification.

C. Laboratory

For the calendar year of 2015, the City of Clinton Wastewater Treatment Plant Laboratory successfully passed all annual proficiency testing, and maintained certification for twelve (12) pollutant test methods. The WWTP Laboratory was recognized by Environmental Research Associates during the 2015 calendar year as a Laboratory of Excellence for achieving 100% acceptable data in proficiency testing.

V. System Maintenance and Improvements

A. Collection System

During the 2015 calendar year, Collection System personnel performed routine cleaning of approximately 48,500 ft. of collection lines. They have been working closely with NCDOT on ongoing highway NC24 improvements, and have replaced twenty feet of eight inch sewer lines in connection with the project. The crew has begun utilizing a new camera system which allows for better assessment of conditions within the Collection System.

In addition to routine maintenance the following repairs and/or upgrades were made to the system in 2015:

Collection System Repairs/Upgrades in 2015
120 Feet of Collection lines replaced
140 Feet of new 4 inch service connections added to system
2 Manhole rings and covers replaced, and 1 new manhole installed
18 New cleanouts installed
4 New connections added
Camera assessment of over 5000 feet of Collection System main performed
Installation of 100 amp transfer switch at high school lift station

B. Wastewater Treatment Plant

During the calendar year of 2015, in addition to routine maintenance of the plant and effluent outfall receiving waterways, the following major repairs, replacements or upgrades were made to the WWTP:

Wastewater Treatment Plant Repairs/Upgrades in 2015	
Jan -2015	Replaced two SO_2 regulators at chlorine contact chamber
Feb - 2015	Rebuilt valve actuator cylinders for filter 5 with all new neoprene rings
Feb - 2015	Rebuilt mudwell turbine pump and replaced shaft bearings
March - 2015	Repaired pump for Jet Aeration Basin including 2 new impellers with protective ceramic coating and rebuilding and rewinding of submersible pump motor
Apr - 2015	Refurbished primary clarifier 'A' with new concrete wall and protective coating
Dec - 2015	Replaced impellers and wear rings on 2 return sludge pumps

VI. Performance: Summary of Performance for Reporting Period

A. Collection System Performance

The City of Clinton applied for renewal of the Collection Systems permit #WQCS00079 in May of 2015, and received permit renewal on June 24, 2015, effective November 1, 2015 through October 31, 2023.

A summary of sanitary sewer overflows follows:

Sanitary sewer overflows may result from a variety of causes: inflow and infiltration due to high water levels; blocked pipes from rags, roots, and grease accumulation; broken lines from corrosion or construction activity; power failures at pump and lift stations within the system. The City of Clinton is routinely working to maintain and improve the efficiency of our Collection System by increasing routine maintenance of lines and lift stations and participating in an ongoing education program in which citizens are instructed in the importance of proper disposal of household waste, including fats, oils, and grease. The City is encouraging its citizens and system users to recycle used cooking oil, avoid the use of 'flushable' wipes, and limit garbage disposal usage, in particular. Flyers were distributed to areas throughout the City in 2015, and City staff participated in additional public outreach opportunities such as the Sampson County Business Expo.

January 6th, 2015
A spill estimated to be 450 gallons from manhole #0433 located on West Elizabeth St. occurred due to debris in the line. The debris was determined to be a trash bag full of garbage as well as a large mass of loose wipes from a domestic source. Approximately 50 gallons of the spill waters were estimated to have entered the Dollar Branch. Clean-up was performed by physically removing the debris. The crew built an earthen berm to keep spill water from flowing into the drainage ditch, and lime was applied to the area directly adjacent to the manhole. The remaining debris was removed and disposed of in the landfill. Samples were collected up and downstream from the entry point to surface waters. As required, the spill was reported to NCDEQ, DWR. At this time, there is no known environmental impact to the receiving stream. Flyers were distributed to the surrounding residences instructing residents on what can and cannot be disposed of in the City's Collection System.
September 22nd, 2015
A spill estimated to be 450 gallons from manhole #1440 located in Dogwood Circle occurred due to a cold grease blockage in the line. Approximately 50 gallons of the spill waters were estimated to have entered the Dollar Branch. The grease and a few rags were removed, and the line was cleared with a line jetter. Clean-up was performed, and lime was applied to the area directly adjacent to the manhole. The remaining debris was removed and taken to the landfill. Samples were collected up and downstream from the entry point to surface waters. This section of sewer line has had continual problems with grease blockages. The city has spoken to the management of the apartment complex that feeds this line about proper disposal of fats, oils, and grease and proper use of the Collection System. This section of the Collection System is cleaned and inspected at least twice per year in an effort to prevent similar occurrences. Also, flyers discussing fats, oils, and grease as well as what can and cannot be flushed are distributed city wide annually. Targeted flyers were redistributed following this event. As required, the spill was reported to NCDEQ, DWR. At this time, there is no known environmental impact to the receiving stream.

B. Wastewater Treatment Plant Performance

During the calendar year of 2015, the City of Clinton Norman H. Larkins WWTP treated approximately 1.04 billion gallons of wastewater. The plant and its associated laboratory facility underwent routine inspection by the North Carolina Department of Environmental Quality (NCDEQ) for the calendar year of 2015. Both were found to be in compliance with state and federal regulations.

The following table summarizes plant performance for the calendar year 2015 in comparison with Nation Pollutant Discharge Elimination System (NPDES) permitted limits:

NORMAN H. LARKINS WASTEWATER TREATMENT PLANT EFFLUENT ANALYSIS

Parameter	Limit Interval	Spring / Summer (April 1 to October 31)		Fall / Winter (Jan 1 to March 31 and November 1 to December 31)	
		NPDES Limits	Measured Values; Range or Mean	NPDES Limits	Measured Values; Range or Mean
Flow	Mean Monthly	5.0 MGD	**2.7 MGD**	5.0 MGD	**3.0 MGD**
pH	Daily	6.0 to 9.0 S.U.	**6.7 to 7.9 S.U.**	6.0 to 9.0 S.U.	**6.8 to 7.7 S.U.**
Residual Chlorine	Daily Maximum	17.0/50.0 µg/L	**33.0 µg/L**	17.0/50.0 µg/L	**49.4 µg/L**
BOD_5	Mean Monthly	5.0 mg/L	**3.4 mg/L**	10.0 mg/L	**4.5 mg/L**
Ammonia Nitrogen	Mean Monthly	1.0 mg/L	**<1.0 mg/L**	2.0 mg/L	**<1.0 mg/L**
Total Suspended Residue	Mean Monthly	30.0 mg/L	**3.3 mg/L**	30.0 mg/L	**13.0 mg/L**
Fecal Coliform	Geometric Mean Monthly	200 cfu/ 100 mL	**20 cfu/100 mL**	200 cfu/ 100 mL	**22 cfu/100 mL**
Dissolved Oxygen	Daily Minimum	6.0 mg/L min.	**6.0 to 8.4 mg/L**	6.0 mg/L min.	**6.3 to 12.9 mg/L**
Temperature	Daily	Monitor	**21.0 to 31.6°C**	Monitor	**12.0 to 26.5 °C**
Conductivity	Daily	Monitor	**1362 µmhos/cm**	Monitor	**1177 µmhos/cm**
Total Cyanide	Quarterly	Monitor	**< 5 µg/L**	Monitor	**<5 µg/L**
Total Nitrogen	Monthly	Monitor	**29.1 mg/L**	Monitor	**22.7 mg/L**
Total Phosphorus	Monthly	Monitor	**13.6 mg/L**	Monitor	**10.8 mg/L**
Total Copper	Quarterly	Monitor	**6.0 µg/L**	Monitor	**2.5 µg/L**
Total Zinc	Quarterly	Monitor	**36 µg/L**	Monitor	**59 µg/L**
Total Mercury(LL)	Quarterly	Monitor	**3.07 ng/L**	Monitor	**<0.5 ng/L**
Total Lead	Monthly	Monitor	**<10 µg/L**	Monitor	**<10 µg/L**

The Norman H. Larkins Wastewater Treatment Plant had only (1) non-compliance event for the 2015 reporting period. This event was reported to the North Carolina Department of Environmental Quality (NCDEQ) as required. The POTW received a notice of violation for the non-compliance event. No civil penalty was issued to the POTW.

2015, Month of February, Week of February 28
The monthly and weekly Total Suspended Solids average was exceeded for effluent. The event was due to of a combination of frozen ground at our solids land application site and high water from an excess of precipitation. Due to heavy sleet, freezing rain, and snow, the land application sites became unsuitable for the administration of biosolids. The Fayetteville Regional Office was appealed to for special dispensation, but the action was not approved. Since the sludge could not be moved off site, the plant became overloaded with solids, and the heavy precipitation caused filters to become overburdened, sending the excess suspended solids into the effluent. In order to prevent similar events from occurring, the Wastewater Treatment Plant is currently in the process of planning a future expansion which will include an increase in the number of aerobic digesters as well as an up-front equalization/holding tank. These improvements will allow the plant to accommodate an increase in the amount of sludge held onsite and will provide additional capacity for heavy rain and severe weather events.

V. Notification

This report will be published in the Sampson Independent, and included on the City of Clinton website at: http://www.cityofclintonnc.com/services/public_works_and_utilities/wastewater_treatment.php.

VI. Certification

This report was certified on April 28, 2016 by Mr. Jeff Vreugdenhil, Director of Public Works and Utilities, Mr. Neil Carroll, Wastewater Treatment Manager, and Mr. Michael Christopher Medlin, Utilities Superintendent. Signatures are on file at the Clinton City offices, and may be viewed upon request.