DURHAM COUNTY

Triangle Wastewater Treatment Plant

PERFORMANCE ANNUAL REPORT

JULY 2019—JUNE 2020

Triangle Wastewater Treatment Plant
5926 NC Hwy. 55 E.
Durham, NC 27713
(919) 560-9033

Permits:

Wastewater Treatment Plant: NC0026051

Collection System: WQCS00038

Stormwater : NCG110054

Reclaimed Water: WQ0032821

Owned and Operated by:

Durham County Engineering & Environmental Services Utilities Division

Contact:
Stephanie Brixey
Deputy Director

Northeast Creek

The Utilities Division bears the responsibility for wastewater collection and treatment. The County's wastewater collection system and treatment facility provides service to homes, industries, and commercial establishments. Wastewater is all domestic and process water from any drain leaving a home, industry, or commercial establishment that enters the collection system. Wastewater travels through sewer pipes underground to the treatment plant where it is treated by biological and chemical processes. More about the process can be found on page 3. Currently, there are 6,400 connections to the collection system which resulted in an average of 3.39 million gallons of wastewater each day during fiscal year 2020. The wastewater is treated at the Triangle Wastewater Treatment Plant (WWTP) and discharges into the receiving stream, Northeast Creek.

The wastewater collection system consists of approximately one hundred and five miles of gravity lines and eleven miles of pressurized force mains, thirteen pump stations, and two thousand, three hundred manholes. Pump stations are also referred to as lift stations because that is exactly what they do. Where there are areas of higher elevation and the wastewater can no longer flow by gravity, there is a pump station where the flow is pumped or lifted to the higher elevation where it can again flow by gravity.

Wastewater treatment is a complex process that requires expensive equipment and skilled operations, maintenance, laboratory, solids handling, and engineering personnel working constantly to assure adequate treatment twenty-four hours per day, seven days a week, three hundred and sixty-five days a year.

Collection System

Durham County owns and maintains a wastewater collection system which includes 105 miles of gravity sewer, 11 miles of pressurized force mains, and 13 pump stations.

In the past 12 months Durham County had three reportable spills.

- On July 31, 2019, a spill estimated at 418,880 gallons of wastewater occurred as a result of stream bank erosion causing the pipe to collapse.
- On March 18, 2020, a spill estimated at 21,319 gallons of wastewater as a result of debris and grease in the line.
- On March 20, 2020, a spill estimated at 3,740 gallons of wastewater occurred as a result of a plug in the line.

The Durham County Utilities Division prides itself on providing a high level of customer service. All commercial and residential customers' questions and concerns are responded to in a timely manner. If you have a question or concern regarding the collection system, services or any item covered in this report, please call (919) 560-9033.

Reuse Water

The Triangle Wastewater Treatment Plant (TWWTP) operates a reuse water system. Some of the uses of this water include: landscape irrigation, industrial cooling, industrial process water and sewer cleaning. Approximately 207.4 million gallons of reuse water was distributed during the fiscal year.

Projects & Rehabilitation

Throughout the last year, the County has continued its efforts to rehabilitate aging collection system infrastructure and increase sanitary sewer capacity to facilitate economic growth in our service area. Some of these completed projects include:

⇒ 1,600 linear feet of 18" vitrified clay pipe (VCP) was replaced with ductile iron pipe (DIP) and C900 polyvinyl chloride (PVC) pipe;

⇒ Pipe bursting replacing 252 linear feet of 8" vitrified clay pipe (VCP) was replaced with high-density polyethylene (HDPE) pipe;

⇒ Lake Park Pump Station - a bypass connection and a new 7.5 horsepower pump were installed, and replaced impeller on older pump;

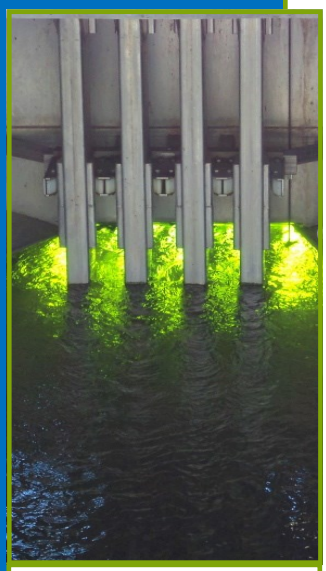
⇒ Central Park Pump Station – replaced the pump impellers;

⇒ Fairfield Pump Station – check valves and the automatic recirculation valve (ARV) was replaced; and

⇒ Page Road Pump Station – check valves and shut off valves were replaced.

Biosolids System

The TWWTP generates biological residuals (approximately 5,120 wet tons per year), which are dewatered by centrifuges. The dewatered cake (approximately 900 wet tons per year) is transported to McGill Environmental Systems, where it undergoes further biological treatment to produce a Class A biosolid. These biosolids are beneficially used as soil amendments in commercial landscaping and agricultural activities.



Ultraviolet (UV) System

In the past year, while treating 1.24 billion gallons of wastewater, the TWWTP was compliant in all sampling events except for one BOD violation.

Treatment System & Process

The **Influent Pump Station (IPS)** is used to pump raw wastewater (sewage) to the treatment process to be biologically treated. The IPS is sized for 12 million gallons per day average flow.

The **Fine Screens** are used to remove fine materials from the wastewater such as grit, sand, egg shells, etc. All of the organic materials are washed off and used in the biological treatment process.

The **Five Stage Biological Nutrient System** is where all biological treatment takes place, such as removing ammonia through nitrification and denitrification processes as well as the removal of phosphorus.

The **Chemical Polishing** process removes any phosphorus that is remaining after the biological treatment process. Methanol is used in this polishing process to add additional BOD to support the denitrification treatment process.

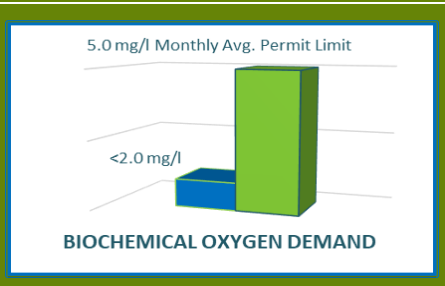
The **Clarifiers** are where the biomass is separated from the treated wastewater and then is returned to the BNR for further treatment.

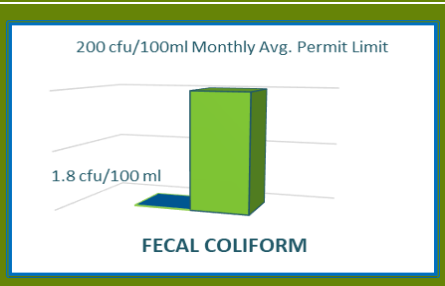
The **Tertiary Filters** are next in the clarification process which removes all remaining unsettled biomass in the treatment process.

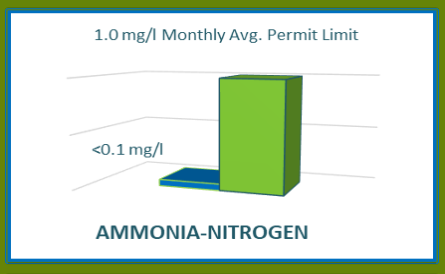
The **Ultraviolet Disinfection** treatment process is used to remove all disease causing bacteria without creating harmful by-products.

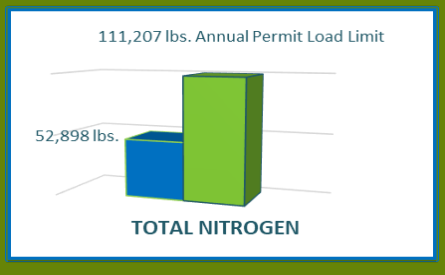
The **Reaeration** stage of the treatment process adds dissolved oxygen to the treated wastewater to meet required permit limits before it is discharged to Northeast Creek.

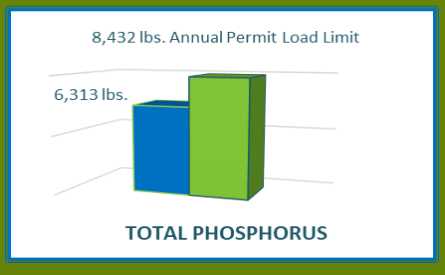
Effluent Annual Average Data











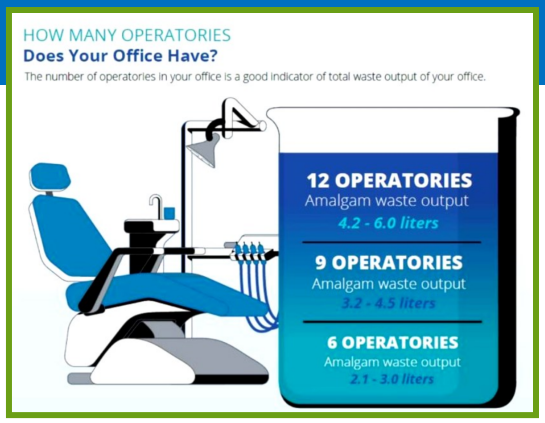
Clarifier

Lab & Pretreatment Program

The Triangle Wastewater Treatment Plant's (TWWTP) laboratory staff collects and analyzes wastewater samples as required by the NPDES permit and the reclaim water permit. Currently, the laboratory is certified by the Division of Water Resources Laboratory Certification Branch to analyze ammonia, biochemical oxygen demand, total residual chlorine, conductivity, dissolved oxygen, fecal coliform, pH, temperature, and total suspended solids. Staff determines the age and health of the activated sludge and identifies microorganisms, such as amoebae, bacteria, ciliates, flagellates, nematodes, rotifers, and water bears.

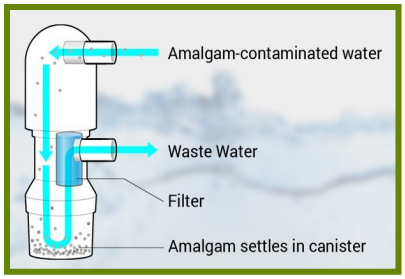
The TWWTP implements an Industrial Pretreatment Program (IPP) to control pollutants which may cause pass through or interfere with the treatment plant's processes, which may contaminate sewage sludge, or potentially be hazardous to worker's health and safety. Currently, there are forty-nine permitted industries that are regularly inspected and monitored to ensure their discharges meet specific permit limits. Thirteen of these industries are Significant Industrial Users (SIUs). Biosafety Laboratories in our service area have also been identified and eighteen are currently permitted. Several of the Industrial Pretreatment Permit holders are required to certify that their facility has followed biosafety procedures consistent with the fifth edition of the Biosafety in Microbiological and Biomedical Laboratories, US DHHS -PHS, -CDC and -NIH for the deactivation of Biosafety Level 1, 2, 3 or 4 materials prior to discharge to the sewer system.

DENTAL AMALGAM RULE



Dental amalgam, typically referred to as a "silver filling" is made of liquid mercury and a powder containing a mixture of other metals such as silver, tin, copper, and zinc. The pollutant of concern in this alloy is mercury, which has a bioaccumulative toxic effect when introduced into the environment, especially in aquatic ecosystems. Amalgam discharged to the POTW has the potential to enter the creek through the effluent discharge.

The Dental Amalgam Rule applies to dental dischargers and became effective July 14, 2017, for the purpose of reducing the amount of mercury that is discharged by dental offices. The rule requires dental offices to collect dental amalgam containing mercury in an amalgam separator or similar amalgam removing device. In compliance with the Dental Amalgam Rule, Durham County has conducted and continues to survey all dentist in the service area. The survey requires dentists to complete a One-Time Compliance Report detailing amalgam collection and disposal practices to protect the Triangle WWTP and Northeast Creek. The One-Time Compliance Report is due no later than October 12, 2020. Any dental facility that began discharging after July 14, 2017, was required to comply with the rule immediately.



August 31, 2020

Notification:

This Performance Annual Report covering July 1, 2019 through June 30, 2020, was forwarded to the NC Department of Environmental Quality. Public Notice of the report was advertised in the Durham Herald Sun newspaper and is available for review at the following locations:

Clerk to the Board
200 East Main St.

Main Library
300 N. Roxboro St.

South Regional Library
4505 S. Alston Ave.

Website
www.dconc.gov

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.

Stephanie Brixey
Deputy Director

By putting Fats, Rags, Oils, and Grease down the drain, FROG builds up inside pipes and can cause a complete blockage. Clogged pipes overflow in your home and in the environment resulting in increased cost to residents due to repair and maintenance costs.