



DURHAM COUNTY

Triangle Wastewater Treatment Plant PERFORMANCE ANNUAL REPORT

JULY 2016—JUNE 2017

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

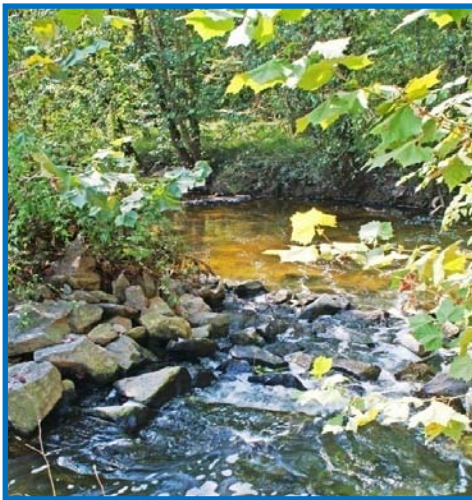
Owned and Operated by:

Durham County
Engineering
&
Environmental Services
Utilities Division

Contact:

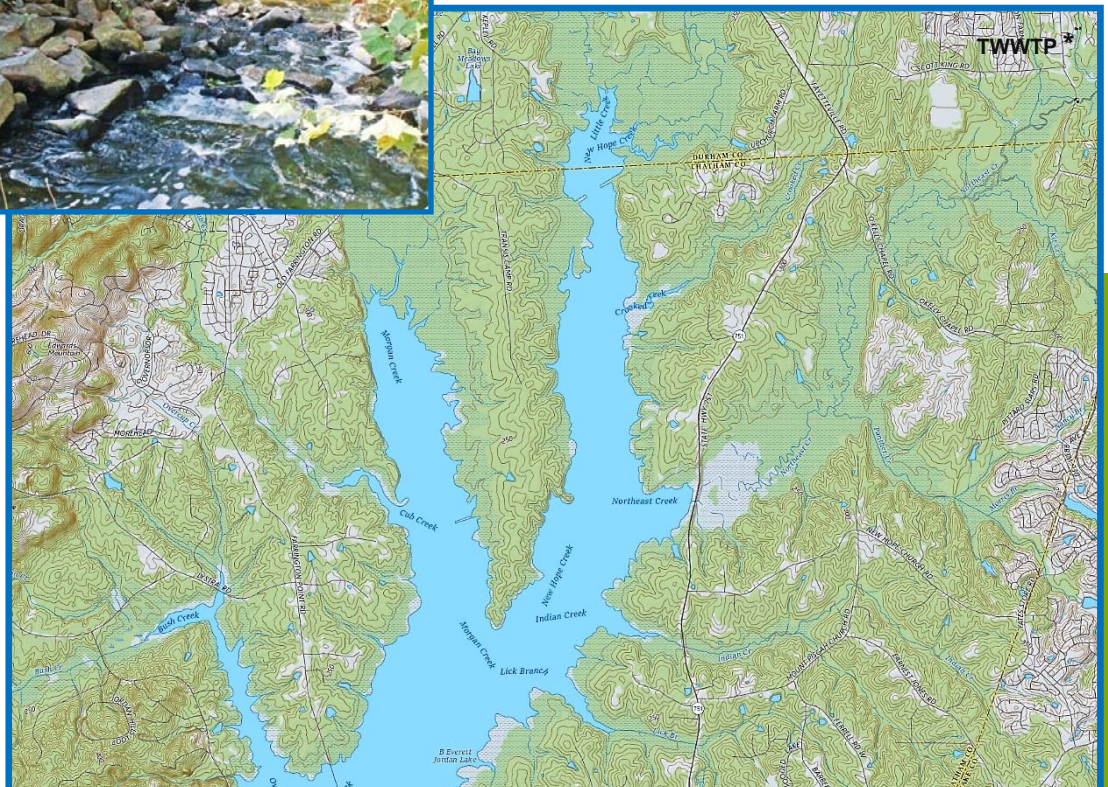
Stephanie Brixey
Acting Deputy Director

The Durham County Triangle Wastewater Treatment Plant's (TWWTP) effluent discharges into Northeast Creek. Northeast Creek flows into the New Hope Arm portion of Jordan Lake near Highway 751 and has an average hydraulic retention time of 418 days before discharging over the dam seventeen miles downstream. Jordan Lake is a water supply source for several communities, a recreational area for fishing and swimming, and a habitat for many aquatic animals.



TWWTP staff take pride in their work to ensure that our effluent discharge is of high quality to protect Northeast Creek.

The Durham County wastewater collection and treatment system serves over 10,000 residential, commercial, and industrial customers in Southeast Durham County, including the Research Triangle Park.



Northeast Creek Discharge Point (top left picture)

Collection System

Durham County owns and maintains a wastewater collection system which includes 95 miles of gravity sewer, 9 miles of pressurized force mains, and 13 pump stations.

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

- On April 25, 2017, a spill estimated at 70 gallons of wastewater occurred resulting from root intrusion into a sewer lateral line.
- On May 25, 2017, an estimated 750 gallons spilled into a stormwater retention pond that discharges to an unnamed tributary of Stirrup Iron Creek due to debris in the line.
- On June 13, 2017, a spill estimated at 1,101,450 gallons of wastewater, occurred due to a collapsed section of sewer 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 99.2 million gallons of Reuse water was distributed during the fiscal year.



Projects & Rehabilitation

In the past year the County has continued its efforts to rehabilitate aging infrastructure and increase sanitary sewer capacity to facilitate increased population growth in our service area.

Construction started on the Stirrup Iron Pump Station Improvement Project to install a grinder and a new concrete pad for the odor control chemical storage tank. The grinder will help limit solids build-up in the wet well. Plans and specifications were prepared to increase the capacity of the Slater Road pump station. A sanitary sewer hydraulic model for the Stirrup Iron pump station sewer basin was developed to help direct the capital improvement plan. Additionally, the old influent pump station was demolished as part of our continued effort to improve safety.

Biosolids System

The TWWTP generates waste biological residuals (approximately 600 million wet pounds per year), which are dewatered by centrifuges. The dewatered cake (approximately 14.5 million wet pounds per year) is transported to McGill's Composting, 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) Bulb System

The TWWTP was compliant in all sampling events for the past year, while treating 1.84 billion gallons of wastewater.

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 organic 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 take 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 returned to the BNR for further treatment.

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

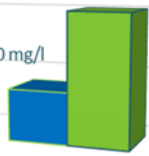
The **Ultraviolet Disinfection** treatment process is used to remove all disease causing bacteria without harmful by-products.

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

5.0 mg/l Monthly Avg. Permit Limit

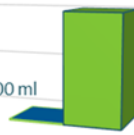
<2.0 mg/l



BIOCHEMICAL OXYGEN DEMAND

200 cfu/100ml Monthly Avg. Permit Limit

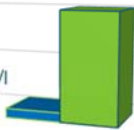
1.83 cfu/100 ml



FECAL COLIFORM

30 mg/l Monthly Avg. Permit Limit

<2.5 mg/l



TOTAL SUSPENDED SOLIDS

1.0 mg/l Monthly Avg. Permit Limit

<0.1 mg/l



AMMONIA-NITROGEN

111,207 lbs. Annual Permit Load Limit

89,702 lbs.



TOTAL NITROGEN

8,432 lbs. Annual Permit Load Limit

4,451 lbs.



TOTAL PHOSPHORUS



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 workers' health and safety. Currently, there are forty-three 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. Currently, thirteen of these labs are 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.



Amalgam Separators

“EPA Issues a Final Rule Governing Amalgam Separators”

EPA promulgated pretreatment standards to reduce mercury discharges from dental offices into the POTW under regulation 40 CFR Part 441 effective July 14, 2017. Any dental offices that use or remove amalgam must operate and maintain an amalgam separator. If an existing dental office currently has an amalgam separator, it must be replaced with an ISO 11143 compliant amalgam separator after its lifetime has ended but no later than June 14, 2027. New dental offices must comply with the final rule immediately.

Dental offices will not be considered Significant or Categorical Industrial Users. They will be required to submit a one-time compliance report to the POTW that will include information about the facility, the operation of the facility, and a certification statement signed by an authorized representative that the dental office meets the requirements of the final rule. Additional information can be found at: <https://www.epa.gov/eg/dental-effluent-guidelines>.

August 31, 2017

Notification:

This Performance Annual Report covering July 1, 2016 through June 30, 2017, 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.

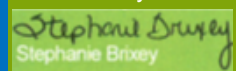
Main Library
300 N. Roxboro St.

South Regional Library
4505 S. Alston Ave.

Website
www.dconnc.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 Braxey

Acting Deputy Director