



APEX
NORTH CAROLINA

2022-2023

Annual Wastewater Report TOWN OF APEX



NPDES NC0064050

TOWN OF APEX

WASTEWATER TREATMENT

The Town of Apex Water Reclamation Division is dedicated to protecting public health and the environment by providing high quality wastewater treatment in an economically and ethically responsible manner to maintain the quality of life in Apex.

Every day millions of gallons of wastewater begin the journey from kitchen sinks, bathtubs, toilets, washing machines, dishwashers in homes and businesses throughout Apex, and travels through the Town's collection system to the Water Reclamation Facility (WRF). The Town of Apex owns and operates the Apex Water Reclamation Facility located in the Neuse River Basin and partners with the Town of Cary at the Western Wake Regional WRF, located in the Cape Fear River Basin. The Apex Water Reclamation Facility is designed to treat 3.6 million gallons of wastewater a day. This past fiscal year 460.3 million gallons were treated, with an average of 1.26 million gallons per day. This facility is designed to remove biochemical oxygen demand (BOD), total suspended solids (TSS), ammonia (NH-3), nitrogen, phosphorus and viruses from its discharge. We are proud to report during the past fiscal year the facility removed the pollutants (BOD, TSS, NH-3) with an average efficiency of 99.4%.

The Apex WRF provides preliminary treatment that involves debris screening and grit removal, secondary treatment (where biological treatment and nutrient reduction occurs) and tertiary treatment that is achieved by rotating disc filters. The final treatment process is the disinfection stage where the water is disinfected by the use of high intensity ultraviolet lamps. Critical equipment is monitored 24 hours a day with a data acquisition system, and the facility is equipped with three standby generators.

The treated water from the Apex WRF is discharged into an unnamed tributary of Middle Creek in the Neuse River Basin under the National Pollutant Discharge Elimination System (NPDES) permit number NC0064050. The WRF maintains a certified analytical laboratory approved by the State of NC and the EPA. The laboratory is certified to perform environmental analysis and report monitoring data to the Division of Environmental Quality (DEQ) for compliance with NPDES effluent, surface water, groundwater, and pretreatment regulations.

This fiscal year (2022-2023) we met and exceeded all compliance requirements.

TOWN OF APEX

COLLECTION SYSTEM PERFORMANCE

The Town's wastewater collection system consists of over 300 miles of pipe, 288 miles of gravity sewer and 37.85 miles of force main pipe. The Town also owns and maintains 31 pump stations, with Pleasant Park pump station coming online soon. All stations are equipped with Aquavx Scout unit automated controls, standby power, audible/visible alarms, and automated monitoring devices. All stations are monitored daily by the Collection System staff with the use of SCADA equipment. These pump stations operate 24 hours 7 days a week, 365 days a year. The Town's collection system operates under the permit number WQCS00064 issued by the State of North Carolina.

Sanitary Sewer Overflow (SSO) occur when problems in the system cause sewage to flow out of manhole covers, service clean outs or plumbing fixtures. The Town strives to have zero spills from our collection system but items such as grease, trash or debris, can disrupt the sewer system and cause a spill. Other issues, such as excessive storm water from rain events, pipe age and pump station equipment failure can also contribute to SSO's.

In an effort to minimize or to prevent spills, the Collection system staff uses video equipment for inspections and incorporates routine flushing for preventive maintenance. In addition, the Town has a rapid response program with 24-hour on call personnel to help mitigate spills. The staff is required to inspect and clean at least 10% of sewer lines each year. This past fiscal year, over 358,065 linear feet (67.8 miles), roughly 20% of sewer lines, were cleaned by flushing and 151,836 feet (28.7 miles) were CCTV inspected. The Town of Apex implemented a new tool this year, called the Sewer Line Rapid Assessment Tool (SL-RAT), which allowed for an additional 228,007 linear feet (43.1 miles) of sewer line to be inspected.

This fiscal year we experienced zero SSO's!



WESTERN WAKE REGIONAL WATER RECLAMATION FACILITY

This facility is in partnership with the Towns of Cary, Apex and Morrisville. The Western Wake Regional Water Reclamation Facility (WWRWRF) is a central part in a major organization that provides a regional wastewater treatment solution to meet the needs of our area's growing population.

The facility currently discharges 7.21 million gallons a day. Apex contributes approximately 3.74 mgd of the total flow. The WWRWRF is currently permitted to treat and discharge 18 million gallon per day (MGD). The wastewater treatment facility is designed to remove Biochemical Oxygen Demand, Total Suspended Solids, Total Nitrogen compounds, Total Phosphorous compounds, and other undesirable constituents. The facility releases highly treated wastewater back to the natural environment. The facility uses advanced monitoring and controls to treat the wastewater. The treated water from the Western Wake Regional Water Reclamation Facility is discharged into the Cape Fear River just downstream of the Buckhorn Dam. The Facility NPDES permit number is NCO088846.

GREASE

IS IT REALLY A PROBLEM?

In the sewage collection and treatment business, grease is singled out for special attention because of its poor solubility in water and its tendency to separate from the liquid solution. Large amounts of oil and grease in the wastewater cause trouble in the collection system pipes and the wastewater treatment plant. Oil and grease decreases pipe capacity and therefore, requires piping systems be cleaned more frequently, piping to be replaced sooner, and/or may cause a sewer overflow.

Grease in a warm liquid form may not appear harmful. But, as the liquid cools, the grease or fat congeals and causes nauseous mats on the surface of settling tanks, digesters, and the interior of pipes and other surfaces which may cause a shutdown of treatment plant units or messy backups in your home or business.

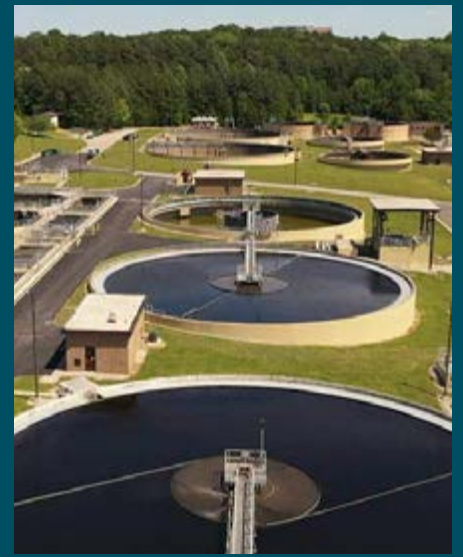
Grease from gravy, cooking oil, and sauces may look harmless as a liquid, but when it cools it gets thick and sticky. If grease is poured down the drain, it sticks to pipes and eventually causes clogs and messy overflows.

Prevent backups in your home by pouring all bacon, fried chicken, and other cooking grease into a can, place lid on top of can and put inside of freezer, when full, dispose of can in the trash.

We can work together to achieve our goal; providing reliable service and protecting the environment.

TIPS FOR GREASE DISPOSAL

- Can the grease! Pour cooking oils and grease into a metal can, allow time to cool, and store in the freezer. When the can is full, place in the trash bin. Remember: Can it, cool it, trash it!
- Be aware of the "hidden oils" (salad dressings, cheese, cookies, pastries, sauces and gravies).
- Wipe off all fats, oils, grease and food residue from dishes and cookware into trash bins.
- Use a strainer in the sink to collect excess food particles.
- Clean up grease spills with absorbent material and place into trash bins.



BIOSOLIDS

The Regional Approach

Biosolids are the nutrient-rich organic materials resulting from the treatment of domestic sewage at the wastewater treatment facilities. The biosolids are processed to reduce or eliminate pathogens and minimize odors, forming a safe, beneficial agricultural product.

The Town's biosolids program uses a regional approach in which nutrient rich organic byproducts generated from Apex's WRF and the WWRWRF are treated together at the Western Wake Facility. The regional biosolids program uses heat dryer systems to produce dry, nutrient rich pellets, which can be used as a fertilizer in agricultural applications.

The heat dryer systems used are approved by the US Environmental Protection Agency (USEPA) and the North Carolina Department of Environmental Quality (NCDEQ) as systems that meet Class A Exceptional Quality (EQ) biosolids.

The Apex Water Reclamation facility produced and hauled 260 dry tons to the Western Wake Regional WRF in the 2022-2023 fiscal year.

In summary, the WRF advanced treatment process removes most of the wastewater nutrients and the biosolids management process allows the remaining nutrients to be beneficially recycled.

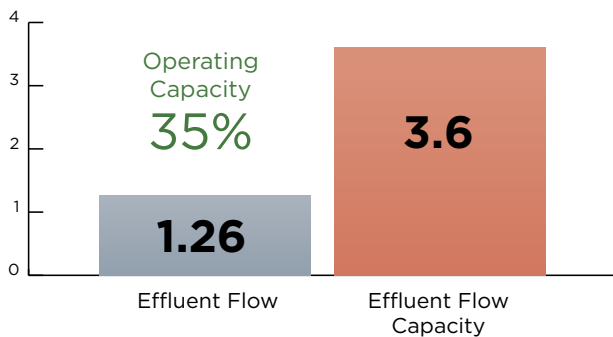
WASTEWATER TREATMENT DATA

We are pleased to report this past fiscal year, the facility removed pollutants (TSS, BOD, NH-3) with an average efficiency of 99.4%.

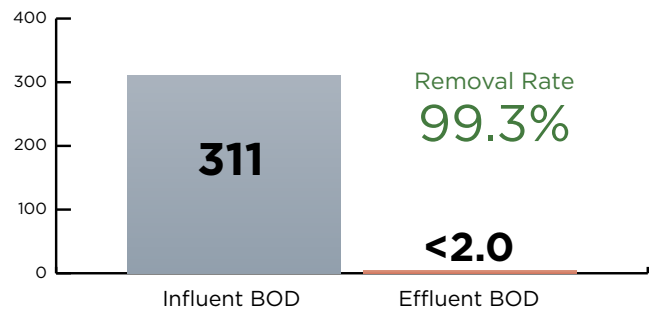
Plant effluent flow discharges into an unnamed tributary of Middle Creek. BOD determines the amount of oxygen required to oxidize organic and inorganic compounds. In other words, BOD refers to the strength of wastewater in terms of the biodegradable material. TSS refers to the dry weight of suspended solids in a sample of water trapped by a filter. These constituents are used to determine the food (BOD) to microorganism (TSS) ratios. The nitrogen compound is a nutrient that can cause algal blooms (eutrophication), reducing the amount of oxygen in the water. Excess amounts of ammonia-nitrogen is toxic to aquatic life.



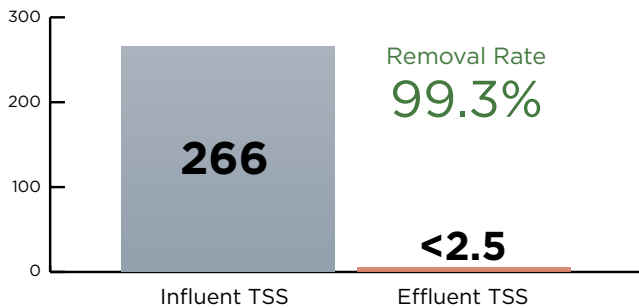
Effluent Average Annual Flow Compared to Plant Capacity in Million Gallons Per Day (MGD)



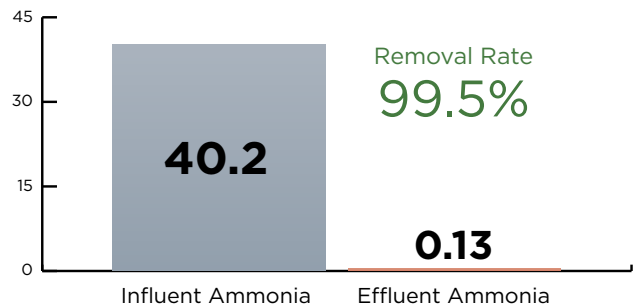
Annual Biochemical Oxygen Demand (BOD) Removal in mg/L



Annual Total Suspended Solids (TSS) Removal in mg/L



Annual Ammonia Nitrogen (NH3-N) Removal in mg/L



Operation of the WRF and the Collection System is provided by the town's Water Resources Department. There are thirty (30) employees that provide day-to-day operation and 24-hour response to all WRF and Collection System emergencies. Employees are certified by the State of North Carolina for proficiency in wastewater treatment, pump station maintenance, collection system repair, land application, water reuse, laboratory analysis, and pretreatment management.

Contact us at (919) 362-7055 or (919) 249-3360

- Wastewater information is certified by William Beattie, WRF Manager (ORC)
- Collection System information is certified by Keithy McNeill, Collections System Supervisor
- Michael Deaton, P.E. Water Resources, Director
PO Box 250 Apex NC, 27502 www.apexnc.org

