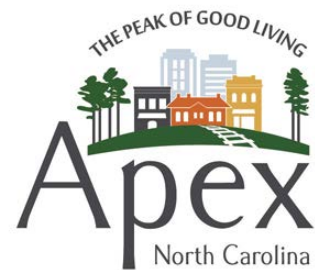


WASTEWATER REPORT 2016 / 2017



Wastewater and Collection System Newsletter

July 2016—June 2017

The Town of Apex is pleased to provide this annual performance report on the operation of your Municipal Water Reclamation Facility and Wastewater Collection System.

Wastewater Treatment

The Apex Water Reclamation Facility (WRF) is designed to treat 3.6 million gallons of wastewater a day. This past fiscal year over 396.90 million gallons were treated, with an average of 1.087 million gallons per day. This facility is designed to remove Biochemical Oxygen Demand (BOD), Total suspended solids (TSS), ammonia (NH₃), nitrogen, phosphorus and viruses from its discharge. Nitrogen and phosphorus are nutrients of concern. They have been identified as major contributors to algae growth in areas of the Neuse River Basin.

The Apex WRF provides preliminary treatment which involves debris screening and grit removal, secondary treatment where biological treatment and nutrient reduction occurs, tertiary treatment that removes most of the residual suspended matter and finally the disinfection stage where it 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 wastewater is treated to high levels that meet and exceed water quality standards. The reclaimed water from the Apex facility 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 Water Resources for compliance with NPDES effluent, surface water, groundwater, and pretreatment regulations. This fiscal year (2016-2017) we met and exceeded compliance requirements. Operators quote: *"Working together with the single goal of producing the highest quality effluent possible with the resources we have available."*

2016 PWOC Central Region O&M Award Winner Announcement

The Central Region of the NC Professional Wastewater Operators Committee has selected the Town of Apex Water Reclamation Facility for the 2016 Operations & Maintenance Excellence Award. This facility has demonstrated a consistent high level of professionalism and dedication to their customers and the environment. When you arrive at the WWTP you will notice the beautifully landscaped grounds and facilities. The staff is very proud of their facility appearance but also in achieving removal rates of BOD, TSS, NH-3 with an average efficiency of 99.2%. The Department of Environmental Quality has stated that the Plant's appearance is superb in comparison to other plants that they have visited. The State auditors even like to use the Apex facility to train new auditors.



The Central Region of the North Carolina Professional Wastewater Operators Committee selected the Apex Water Reclamation Facility for the 2016 Operations and Maintenance Excellence Award

**Report period: July 1, 2016
through June 30, 2017**

**NPDES Permit:
NC0064050**

**Collection System Permit:
WQCS00064**

**Land Application Permit:
WQ0001060**

**Reuse Permit:
WQ0021863**



Picture of cascade aeration . The purpose of this final treatment process is to maintain the discharge effluent dissolved oxygen concentrations above 5.0 mg/l.

Western Wake Regional Water Reclamation Facility

This facility is in partnership with the Towns of Cary, Apex and Morrisville. The facility currently discharges 5 million gallons each day. Apex contributes approximately 34% of the flow.

The WWRWMF is rated as an 18 million gallon per day, (MGD), wastewater treatment facility. It is designed to remove Biochemical Oxygen Demand, Total Suspended Solids, Total Nitrogen compounds, Total Phosphorous compounds, turbidity agents, and other undesirable constituents.

The facility releases highly treated and clean 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 NC0088846

Phone 919.469.4090 **Web** www.westernwakepartners.com



Apex / Cary Regional Biosolids Program

Biosolids are the nutrient-rich organic materials resulting from the treatment of domestic sewage at the wastewater treatment facility. 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 Western Wake Facility. The regional biosolids program uses heat dryer systems to produce dry, nutrient rich pellets, which can in turn 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 Environment and Natural Resources (NCDEQ) as systems that meet Class A Exceptional Quality (EQ) biosolids. The Town of Cary markets its fertilizer pellets under the name Enviro Gems and they are currently sold to a wholesaler who distributes the final product for use as a fertilizer for agricultural applications.

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.



The Skinny on Fats, Oils & Grease

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. It decreases pipe capacity and, therefore, requires that piping systems be cleaned more often and/ or some piping to be replaced sooner.

Grease in a warm liquid 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 shut-down of treatment plant units or messy backups in your home or business.

Grease from cooking, gravy, cooking oil, and sauces may look harmless as a liquid, but when it cools it gets thick and sticky. Pouring grease down your 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, putting in the freezer, then tossing it in the trash.

We can work together to achieve our goal; providing you with reliable service and protecting our lakes and streams.

Call (919) 249-3427 to ask how you can receive your FREE can lid, a plastic lid that fits metal cans and easy instructions. Your pipes will thank you for it!

Collection System Performance

The Town's wastewater collection system consists of about 288 miles of pipe, 245 miles of gravity sewer and 43 miles of force main pipe.

The Town also owns and maintains

25 pump stations equipped with automated controls, standby power, audible and visible alarms, and programmable telephone dialers. All stations are checked daily by the Wastewater Collection System staff. These pump stations operate 24/7, 365 days a year. The Town's collection system operates under the permit number WQCS 00064 issued by the State of NC.



Sanitary Sewer Overflow (SSO)

SSOs occur when problems in the system cause sewage to flow out of manhole covers, service clean outs or plumbing fixtures. Everyday millions of gallons of wastewater begin the journey from kitchen sinks, bathtubs, toilets, washing machines, and dishwashers in homes and businesses, and travels through the collection system to the Water Reclamation Facility.

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, 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 inspects and cleans at least 10% of sewer lines each year. During the past fiscal year, over 173,000 linear feet (32.8 Miles) of sewer lines were cleaned by flushing, and 54,260 feet (10.2 miles) were CCTV inspected. This fiscal year we repaired about 12,127 feet of sanitary sewer pipe using a method called Cured-In-Place-Pipe (CIPP). Little to no digging is involved in this process, making for an environmental friendly method. These particular repairs were made in the Historic Downtown area.

2016-2017 Sanitary Sewer Overflows:

Date	Location	Cause of spill	Gallons
10/08/2016	Perry Farm Lift station # 2	Infiltration/Inflow caused by Hurricane Mathew	14,400

Operation of the WRF and the Collection System is provided by the Water Resources Dept. Our 28 employees 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 plant operation, pump station maintenance, collection system repair, biosolids, water reuse, laboratory analysis, and pretreatment management.

Apex Water Reclamation Facility Data

Fiscal Year July 1, 2016 to June 30, 2017 | Monthly Average

Month	Flow MGD		Biochemical Oxygen Demand MG/L		Ammonia MG/L		Total Suspended Solids MG/L		Fecal Coliform # /100ML		Dissolved Oxygen MG/L		Total Nitrogen MG/L		Total Phosphorus MG/L	
	Limit	Actual	Limit	Actual	Limit	Actual	Limit	Actual	Limit	Actual	Limit	Actual	Limit	Actual	Limit	Actual
July	3.6	0.967	5	<2.00	1.0	<0.10	30	<2.50	200	1	>5	7.3	**	2.7	2*	0.10
August	3.6	0.939	5	<2.00	1.0	<0.10	30	<2.50	200	1	>5	7.3	**	3.3	2*	0.52
September	3.6	0.919	5	<2.00	1.0	<0.10	30	<2.50	200	1	>5	7.2	**	3.6	2*	0.67
October	3.6	1.174	5	<2.00	1.0	<0.10	30	<2.50	200	2	>5	7.5	**	3.7	2*	0.63
November	3.6	0.930	10	<2.00	2.0	<0.10	30	<2.50	200	1	>5	7.7	**	3.3	2*	0.39
December	3.6	0.971	10	<2.00	2.0	0.126	30	<2.50	200	1	>5	8.3	**	3.5	2*	0.45
January	3.6	1.246	10	<2.00	2.0	<0.165	30	<2.50	200	1	>5	8.3	**	4.0	2*	1.1
February	3.6	1.086	10	3.97	2.0	0.107	30	<2.50	200	2	>5	8.2	**	4.1	2*	1.2
March	3.6	1.104	10	2.10	2.0	<0.10	30	<2.50	200	1	>5	8.3	**	3.4	2*	0.50
April	3.6	1.293	5	<2.00	1.0	<0.10	30	<2.50	200	1	>5	8.0	**	3.2	2*	0.32
May	3.6	1.206	5	<2.00	1.0	0.101	30	<2.50	200	1	>5	7.4	**	3.5	2*	0.58
June	3.6	1.114	5	<2.00	1.0	1.08	30	<2.50	200	1.2	>5	7.3	**	3.6	2*	0.34

Million Gallons per Day (MGD) Milligrams per Liter (MG/L) Milliliter (ML) ** Yearly lbs. limit (40,547 lbs.) * Quarterly Avg. limit (2.0) mg/l

The Town's Water Reclamation Facility treats wastewater 24 hours a day, 7 days a week, 365 days a year. We are proud to report during the past fiscal year, the facility removed pollutants (BOD, TSS, NH-3) with an average efficiency of 99.2% . The Facility treated over 396.90 million gallons of wastewater and discharged treated water to a unnamed tributary of Middle Creek in the Neuse River Basin. We are happy to inform you the Apex Water Reclamation Facility met or exceeded all report regulations and monitoring requirements set for in our NPDES permit.

July 1, 2016— June 30, 2017 Total Nitrogen pounds (lbs.): 11,515 lbs. Total Phosphorus (mg/l) quarterly average: 0.64 mg/l