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Wastewater Annual Report

..... 2018



Helping to ensure a clean river system is our commitment.

GUC's wastewater system includes two major components: the collection system and the treatment process. Our highly-trained, state-certified staff does an excellent job with both. Wastewater collection/treatment is a 24-hour-a-day, 7-day-a-week responsibility. Ultimately, our goal is to protect both the environment and the quality of life not only for the Greenville region, but for our neighboring communities as well. Each city and town along the Tar-Pamlico River Basin is affected by the quality of water discharged from the respective wastewater treatment plants.

The Clean Water Act of 1999, passed by the NC General Assembly, requires wastewater systems to provide an annual report to their customers. This report summarizes the performance of our Wastewater Collection System and Wastewater Treatment Plant (WWTP) during the 12-month period from July 1, 2017 to June 30, 2018.

During this period, we collected, transported and treated an average of 9.55 million gallons of wastewater per day (mgd) - a total of more than 3.49 billion gallons. We are proud of our collection/treatment system and the job we do in protecting the public health and environment, meeting regulatory requirements and accommodating the orderly growth of the community.

System Performance

During the past 12 months, the total estimated volume from all recorded overflows was 1,175 gallons or approximately 0.00004 percent of the total volume of wastewater that was collected, transported and treated. There were a total of four overflows on our wastewater collection system. Three of these overflows were due to debris and one due to a mechanical malfunction. None of the overflows reaching surface

waters exceeded 1,000 gallons. All overflows were reported in accordance with State regulations to the NC Division of Water Resources. There were no Notices of Violation or penalties assessed for any overflow.

The WWTP continued to remain compliant for all permit requirements for the past 12 months. The average percent removal for conventional pollutants

remained very high at 99.94% for oxygen-demanding pollutants and 99.9% for total suspended solids. Nutrient removal rates were also very good at 55% for total phosphorus and 81% for total nitrogen. There were no Notices of Violation issued to the WWTP by regulatory agencies during the past 12 months.

KEEPING YOU INFORMED

The NC General Assembly enacted legislation in 1999 requiring municipalities, animal operations, industries and others who operate waste handling systems to issue news releases

when a waste spill of 1,000 gallons or more reaches surface waters. A waste spill of 15,000 gallons or more requires a news release as well as a paid public notice.

The Collection System

The network of pipes that constitutes the wastewater collection system includes over 404 miles of gravity pipeline and 76 miles of pressure pipeline ranging in size from 4" to 48" in diameter. The gravity pipelines receive flow from over 29,750 connections and transport it to one of 37 pump stations. The wastewater is then pumped via

the pump stations and pressure pipelines to the WWTP where it is treated prior to being returned to the Tar River. This network of pipelines and pump stations collects and transports approximately 10 million gallons of wastewater every day from homes and businesses in Greenville and parts of Pitt County.

Our wastewater collection system is operated and maintained under a system-wide Wastewater Collection System Permit (#WQCS00014) issued by the State of North Carolina Division of Water Resources. Construction of the system is accomplished through individual non-discharge permits issued by the State for each new extension.

How We Protect The System

We'd like to reduce system overflows to 0% so we work hard to protect our system. The following is an overview of the ways we try to protect our system and prevent overflows:

I/I Investigations. Infiltration/Inflow (I/I) is extraneous water that gets into the wastewater collection system—any water other than sewage. We have an extensive program that includes smoke testing, closed-circuit TV inspection and flow monitoring to assist us in identifying areas of extraneous flow. Once we have located problem areas, we take steps to remediate the problem. During the past year, our crews TV inspected an average of more than 11,500 linear feet of sewer main each month.

Routine Pipe Cleaning. Each month we routinely cleaned an average of more than 21,000 linear feet of sewer pipe with special high-pressure equipment designed to remove grease and

other debris from the system and inspected 1,723 manholes. This routine cleaning and inspection program further reduces the potential for system blockages and overflows.

Priority Cleaning. Portions of the wastewater collection system are more problematic than others and require more frequent cleaning. These portions of the system are cleaned a minimum of once annually to prevent blockages and/or overflows.

Fats, Oils and Grease (FOG) Program. Residual fats, oils and grease are a by-product of food service establishments. Commercial customers that serve food or process meat, etc. are required to have grease interceptors. These grease removal devices are designed to remove animal fats and vegetable oils, leading causes of sewer line blockages. Commercial customers that service or wash motorized vehicles are

also required to have sand/oil interceptors. These devices help protect the wastewater collection system by removing sediments, oil, grease and light petroleum products from the wastewater discharge.

Education. We have an active educational campaign involving fliers, door hangers, newsletters, and advertising designed to inform the public on ways they can help us protect the sanitary sewer system. Each year we welcome hundreds of students who visit and tour the WWTP as part of their education. Our state-of-the-art treatment system offers a unique opportunity for young people to see how biological science applies to the real world. We have also hosted tours for individuals from the community who have an interest in seeing how the plant operates. For further information, or to schedule a tour, please call (252) 551-2066 or (252) 551-3304.



Facebook, Twitter and Instagram are three communication tools we use to keep customers, agencies, the media and the public up-to-date about GUC.

Follow us at Facebook.com/GreenvilleUtilities, Twitter.com/guc_info, and Instagram.com/GreenvilleUtilities.

The Treatment Process

Wastewater treatment is the biological process of removing pollutants from the water so it can be returned safely to the environment. It is the “last line of defense” against water pollution. GUC’s WWTP protects the environment from water that may contain disease-causing bacteria or other pollutants.

Our WWTP was built in 1985 with a capacity to treat 10.5 mgd. In 1995, the plant was expanded and upgraded to treat a capacity of 17.5 mgd, with a future expansion capacity to 35 mgd. The upgrade included a state-of-the-art sustainable treatment technology known as biological nutrient removal. The complex nutrient removal system has since been optimized and now produces some of the highest quality reclaimed water in the industry.

The WWTP discharges treated effluent into the Tar River, which is permitted by the State of North Carolina under its National Pollutant Discharge Elimination System program. The discharged effluent adheres to the target limits for total nitrogen and total phosphorus as part of our membership in the Tar-Pamlico Basin Association (TPBA).

The WWTP operates under a permit issued by the State of North Carolina, Department of Environmental Quality, Division of Water Resources. The National Pollutant Discharge Elimination Permit

(#NC 0023931) allows Greenville Utilities to discharge treated water back into the Tar River. For many of the tested pollutants, the water returned to the Tar River is much cleaner than when withdrawn for use.



Stages of Wastewater Treatment

Treatment is accomplished through a three-stage process: Primary, Secondary and Tertiary.

Primary Treatment

1. Water passes through screens to remove plastics, wood and other floating objects, as well as sand, grit and other heavy solids.

Secondary Treatment

2. To remove any remaining solid materials in the water, compressed air (O₂) is supplied in an aeration tank to stimulate growth of helpful microorganisms, which consume organic matter in the wastewater.
3. The nutrient removal process uses bacteria to remove nutrients (like nitrogen and phosphorus) that are harmful to aquatic life.
4. A secondary clarification tank allows the microorganisms and solid wastes to form clumps and settle to the bottom. Some of this residue is mixed with air again and reused in the aeration tank. The remaining residue is used in our beneficial reuse/recycle program.

Tertiary Treatment

5. The water then passes through a deep-bed sand filter before it is disinfected.
6. Next, the water passes through an ultraviolet disinfection system in which the light inactivates bacteria in the water so it cannot reproduce.



7. The filtered and disinfected water is then returned to the aquatic environment of the Tar River.

Biological residue (biosolids) from the treatment process is handled by our Dewatering Facility. The dewatered biosolids are mixed with organic fillers and processed to produce compost. A private compost firm turns our treatment plant process residue into environmentally-friendly reusable material.

System Improvements

Southside Pump Station

Improvements. Work has been completed on GUC's largest wastewater pumping station. With a total design capacity of 22.3 mgd, the Southside Pump Station is critical to the reliable operation of GUC's wastewater collection system. Improvements included replacement of a large junction box that distributes the wastewater flow between two wet wells at the site, an air handling and odor control system was installed to minimize the impacts of corrosive gases, and a new screening structure was installed to remove solids coming into the station and reduce periodic clogging of pumps and buildup of solids in the wet wells.

Sewer Interceptor Replacement Project. The Harris Mill Run Sewer Interceptor replacement project has been completed. The

Harris Mill Run sanitary sewer interceptor, located within the City's Medical Park District, provides service to Vidant Medical Center, ECU's Health Sciences Campus, and adjacent areas. The upgraded 21-inch diameter pipe should have adequate capacity to serve the maximum development which is anticipated to occur within the service area in future years.

Air Piping Improvements.

The 20-year old aeration system piping at the WWTP has been replaced with new wrapped carbon steel piping. The old piping was nearing end of life and leaking, costing our ratepayers and estimated \$200k/year in operational expense. The successful replacement is now delivering air critical to the treatment processes at the WWTP.

Regional Pump Station

Upgrades. Design is underway on a project to improve operations and reliability at the Green Mill Run Pump Station (GMRPS) and Fork Swamp Pump Station (FSPS). Improvements include the addition of waste stream grinders at each stations, as well as replacement of the bar screen structure and bar screens at each station. The bar screen removes solids coming into the stations and reduces periodic clogging of pumps and buildup of solids in the wet wells. The concrete structures and bar screens are in need of replacement due to severe degradation attributable to corrosive gases contained in the wastewater. The project will also analyze flows to ensure adequate capacity at GMRPS for the next 20 years.



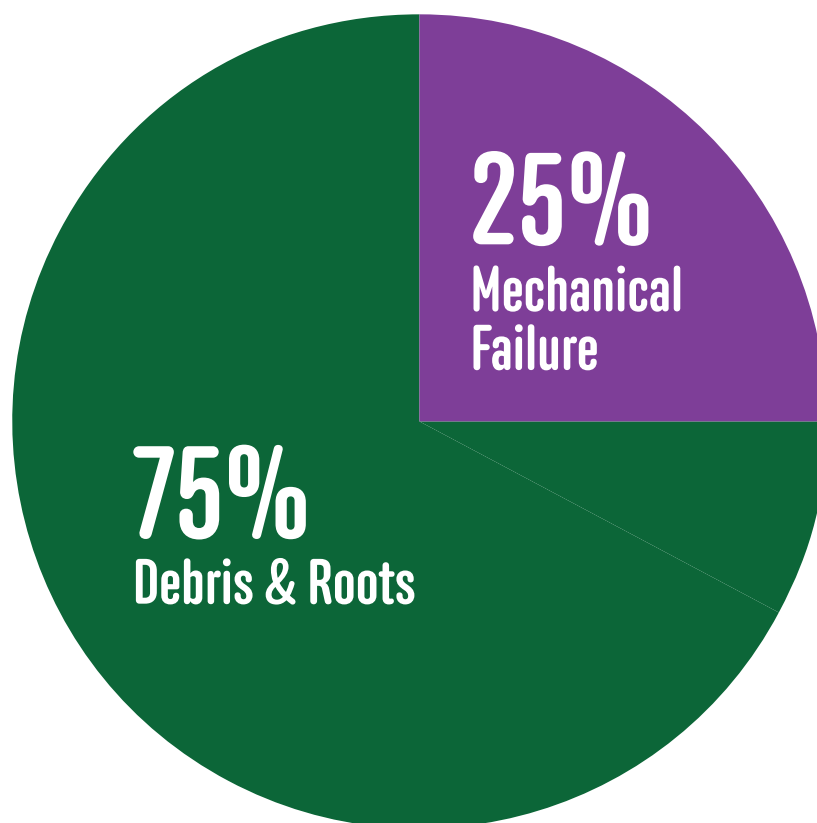
Help Prevent Overflows

Essentially, a wastewater collection system is like a transportation highway. A series of pumps and pipes transports wastewater from our customers to the WWTP. We have to do all we can to make sure “traffic” isn’t allowed to back up. On the highway it would be called a traffic jam. In our case, when “traffic” backs up, it’s called an overflow. Overflows are bad for

the environment and can result in stiff penalties from state regulators.

Most overflows occur when a blockage prevents the normal flow of wastewater. This causes a build-up in the pipe that can eventually spill out of the top of a manhole or clean-out. Historically, the majority of overflows on our system are

caused by blockages, which often occur as a result of improper disposal of grease, flushable wipes, and other debris. Some overflows are caused by excessive inflow and infiltration or leaks into the sewer system. In addition, some problems are caused by tree roots, pipe failure or pipes damaged by private utilities contractors.



FY 2017-18 Causes of Overflows

Cease the Grease

Grease is a real “pain in the drain” because it can clog sewer lines, which can lead to sewer spills. GUC does everything it can to prevent sewer spills, but we can’t do it alone. We need your help!

The best way you can “cease the grease” is to never pour grease (things like oil, butter, margarine, shortening, pan drippings and sauces) down the drain. Instead, let it cool down, collect it in a container—like a used soup can or mayonnaise jar—and throw it away in the trash.

And don’t believe your friends who say (1) it’s okay to pour grease down the drain as long as you run the water at the same time, or (2) it’s perfectly fine to dump grease if you use your garbage disposal to break it up. These are myths. It’s never okay to pour any type of grease down the drain. Here are some more ways to help prevent sewer spills:

- Wipe or scrape your dishes before washing them.
- Remove excess oil from pots and pans with a paper towel

and throw away the towel in a trash can.

- Use strainers in sink drains to collect food scraps and throw away the scraps in the trash.

Thanks for your help, and please spread the word about how important it is to “cease the grease.” Together, we can protect our sewer system and the environment. For more information, call (252) 551-1551.



Call (252) 329-2199 to get a Cease the Grease can lid.



Flushables and Your Wastewater System

Human waste and toilet paper should be the only thing going down the toilet. Unfortunately, over the years, some people have turned the toilet into a trash can. From medications and sanitary products to deceased pet fish and cigarette butts, if it fits, people flush it.

Flushing these types of items down the toilet unnecessarily wastes water (up to five gallons of water with every flush), causes blockages in home plumbing and the public wastewater system and most importantly can result in huge impacts on our sewers, the

environment and the water we strive to protect. Below is a list of items that people commonly flush that should **NOT** be going down the toilet:

- ♦ Sanitary Products
- ♦ Paper Towels
- ♦ Diapers
- ♦ Baby Wipes
- ♦ Facial Tissues
- ♦ Condoms
- ♦ Dental Floss
- ♦ Prescription/Over-the-Counter Medications

All of these are made of materials that don't break down and can cause blockages and overflows. The trash is the proper place for the disposal of these items.

For more information about what you can do to protect the wastewater system and the environment call (252) 551-1551.

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