



CITY OF DURHAM, NORTH CAROLINA

ANNUAL SANITARY SEWER SYSTEM REPORT

FY 2019-2020

Welcome to the City's annual summary of the performance of Durham's sanitary sewer system. In addition to informing our customers about the system, this report also meets the requirements of House Bill 1160 passed by the North Carolina General Assembly in 1999. The bill requires owners and/or operators of wastewater collection and treatment systems to provide an annual report to users or customers.

Each year's report summarizes the treatment works' and collection system's performance over a 12-month period. This report is available to all customers and is submitted to the N.C. Department of Environmental Quality.

About the Department

All water and sewer operational units are a part of the Department of Water Management. The Water and Sewer Maintenance Division is responsible for the operations and maintenance of the collection system. Sometimes referred to as the sanitary sewer system, this is the series of pipes that transport wastewater to the treatment facilities operated by the Wastewater divisions. Wastewater includes all domestic and process water from any drain leaving a residence, business, industry, or other facility and entering the collection system.

Wastewater travels through underground sewer pipes to the treatment plant, where it is treated by physical, biological, and chemical processes before it is returned to the environment via receiving streams.

The City is committed to protecting the environment and the health of downstream users by ensuring that Durham's wastewater discharges meet all applicable standards. Because of this high level of treatment, water downstream of a water reclamation facility may be cleaner than the water upstream of the facility.

This report describes the collection system operation, the wastewater



Construction is nearly complete at the Compliance Services building, which houses the state-certified Lab and the IWC/FOG program.

treatment process, and the City's grease reduction initiative. As with any large municipal system, occasional blockages cause backups and overflows. Included in this report is a table listing the spills and overflows that occurred this year and the steps taken to mitigate the impact and prevent recurrences. ALL incidents were reported to the state within 24 hours of their occurrence. By policy, news releases are distributed to the public by the end of the next business day after an occurrence.

The Annual Sanitary Sewer System Report is available at City Hall, Water Management and Public Works facilities, and on the City's website: www.durhamnc.gov/946. Additional copies of the report may be requested by calling Water Management at 919-560-4381.

Down the Drain! Where Does It Go?

When waste exits a home, business, or industry via piping, the wastewater enters the collection system.

These pipes carry wastewater away

from homes, businesses, schools, hospitals, and industries.

The waste flows by gravity or may flow to lift stations located at strategic points throughout the service area. Pumps in the lift stations do just that — they "lift" the wastewater to a higher elevation where it again flows by gravity, ultimately to one of the City's two water reclamation facilities. Sixty-four lift stations for the collection system are monitored and maintained by Lift Station Maintenance division staff.

Durham sits on a ridgeline that generally runs along Pettigrew Street and the railroad tracks. Wastewater on the north side of the ridgeline flows to the North Durham Water Reclamation Facility (WRF) on East Club Boulevard, and after treatment is ultimately discharged into the Neuse River Basin. The South Durham WRF on Farrington Road receives wastewater that flows south of the ridgeline. After processing, the facility's discharge flows into the Cape Fear Basin.

City of Durham's Sewer System Facilities			
	Collection System	Water Reclamation Facility	
Name of Facility	Water and Sewer Operations Center	North Durham Water Reclamation Facility	South Durham Water Reclamation Facility
Permit Number	WQCS00005	NCOO23841	NCOO47597
Address	1110 Martin Luther King Jr. Pkwy.	1900 East Club Blvd.	6605 Farrington Rd.
Operator in Responsible Charge (ORC)	Junior Mobley	John Dodson	Charles Cocker
Phone Number	919-560-4344	919-560-4384	919-560-4386

Durham County owns and operates a third wastewater treatment plant that serves most of Research Triangle Park, Parkwood, and a few other southern Durham neighborhoods. The Durham County sewer system report is posted at www.dconc.gov.

Collection System Performance

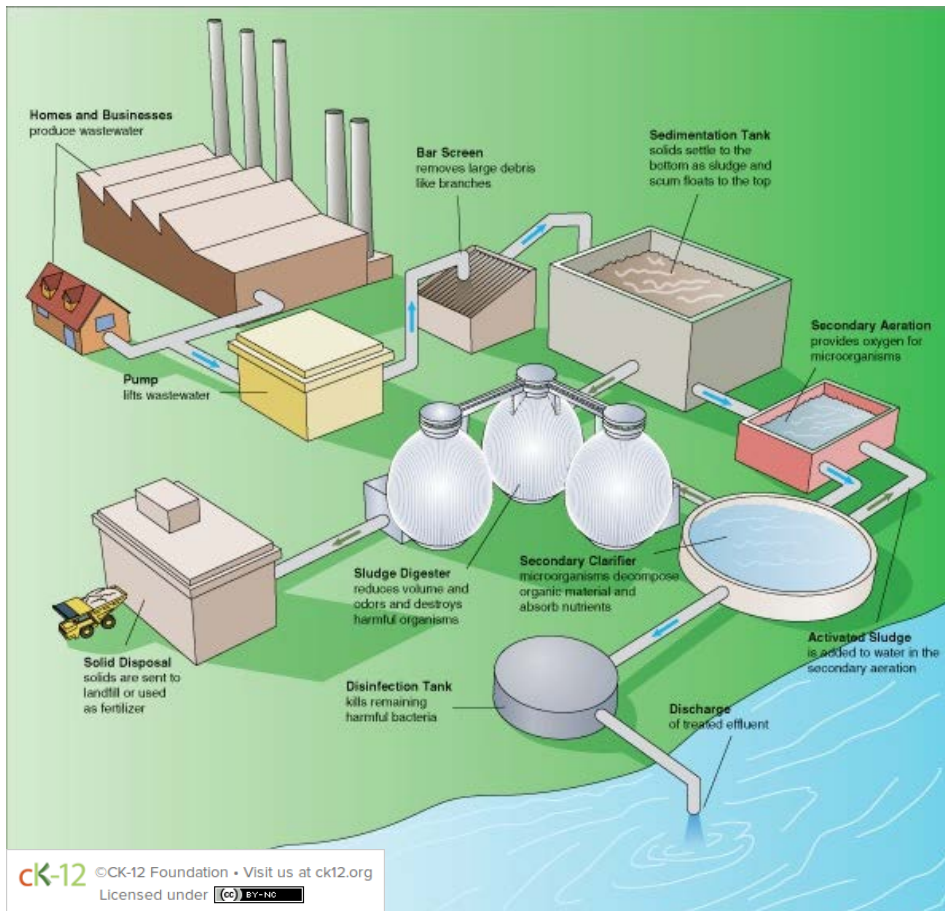
City departments use Geographical Information System (GIS) mapping of the collection system which provides an accurate method of tracking both operations and maintenance activities. Approximately

1,097 miles of the collection system are represented by GIS mapping.

During this reporting period, Water and Sewer Maintenance crews and City contractors conducted numerous maintenance activities to clean and rehabilitate the collection system. These maintenance activities include cleaning lateral services, flushing, camera inspection (CCTV), replacing mains, and mowing easements. Maintenance crews repaired/replaced 141 sewer services, 31 sewer mains, and responded to 671 blockages.

Improper disposal of grease and nonwoven materials contributed to approximately 16% of blockages in the sewer system (see pages 3 & 4).

City staff continues to focus resources on preventing repeat blockages and promoting a maintenance campaign to alleviate the environmental and financial impacts of this problem. One major element of the program has been an extensive cleaning of problem areas of the system. The second major element of the program is the education, prevention, and enforcement effort coordinated by the Department's Industrial Pretreatment/FOG Program. Funding of infrastructure rehabilitation is a high priority of the department's Capital Improvement Program (CIP).



Maintenance Activities	
Activity	Linear Feet
Lateral Service	26,648.40
Flushing	942,373
Inspections (CCTV)	83,689
Mains Replaced	31
Easements Mowed	190,555
Cured-in-Place Pipe	141,913

Water Reclamation Facilities Performance

The City's two wastewater treatment plants, North Durham and South Durham Water Reclamation Facilities (WRFs), have the combined capacity to treat (or reclaim) 40 million gallons per day (MGD) of wastewater. During this reporting period, the combined daily flow treated by the two plants was 18.91 MGD.

It's helpful to review each separately.

This illustration shows the typical wastewater treatment process. The City's water reclamation facilities at North and South Durham have similar layouts.



This October aerial photo shows construction on the B side of the North Durham WRF on East Club Boulevard in northern Durham.

North Durham WRF treated 3.6 billion gallons in FY 2020, at an average of 10.06 MGD.

In FY 2020, NDWRF discharged 63,867 pounds of total nitrogen and 6,176 pounds of total phosphorous - both well under permit requirements and in compliance with Stage 1 of the Falls Lake Rules for nutrient reduction, which went into effect January 1, 2016.

For June (2020) the State issued a Notice of Violation (NOV) for a monthly BOD exceedance. The limit is 5 mg/L and the effluent monthly June average was 5.89 mg/L. BOD measures how much oxygen is needed to break down organic matter in the wastewater. NDWRF met all other permit requirements during this year.

Current construction on site, which is slated for completion in late fall 2020, includes additional clarifiers, new screening facilities, and other process improvements.

South Durham WRF treated 3.230 billion gallons in FY 2020, or an average of 8.85 MGD.

The total nitrogen discharge in FY 2020 was 185,236 pounds, and the total phosphorus discharge was 8,576 pounds.

Phase I Process Improvements began in January 2018. This \$33 million, three-year construction project is moving on schedule with plans that include a new preliminary treatment facility with fine bar screens, modern grit collection equipment, and a two million gallon equalization tank; new air diffusers

in the aeration basins; a new 160-foot diameter final clarifier; and a new ultraviolet (UV) treatment facility.

The South Durham WRF completed the fiscal year without any state issued NOVs.

You can learn more about the City's wastewater treatment process at www.durhamnc.gov/1124.

Industrial Waste Control/FOG

Industrial Waste Control (IWC) staff survey facilities discharging into the sewer system and issue permits to facilities in certain categories, determined by the type of business activity they conduct or the type(s) of wastewater discharged from their facility.

Permit limits are established based on the ability of the receiving treatment plant, either the North Durham WRF or South Durham WRF, to assimilate, treat, and remove substances from the waste. Staff monitors 20 industrial users and more than 800 commercial establishments with high-strength discharges.

To help in the effort to reduce grease blockages in the sewer system, the IWC staff coordinates the education and inspection portion of the grease reduction initiative. FOG (fats, oils, and grease) may enter the sewer system from either household drains or through poorly maintained grease traps in restaurants and other food service establishments.

To meet the 250 mg/L limit for FOG, food preparation and/or processing facilities must clean their interceptor systems (grease traps) on a monthly basis. More frequent cleaning will be required if a facility discharges more than 250 mg/L of FOG. Less frequent cleaning may be permitted if the facility can demonstrate that the 250 mg/L limit can be met with an alternate cleaning schedule. Cleaning and maintenance records must be maintained for three years and available for inspection on request.

While restaurants and other food service establishments typically use commercial processors to collect and remove grease from their grease traps, it is not practical for homeowners and residential customers to contract such services.



For this reason, the City has provided a collection container for used cooking oil at the Waste Disposal and Recycling Center at 2115 East Club Boulevard.

To further help residents keep fats, oils, and grease out of the sanitary sewer, Water Management provides small residential grease collection units called Fat Trappers.

Customers can call 919-560-4386 and ask IWC staff about how to obtain a complimentary Fat Trapper.

DO

- Collect FOG in containers and dispose of it properly.
- Remove FOG from kitchen utensils, equipment, and food prep areas with scraper/towels/broom.
- Keep FOG out of wash water.
- Place food scraps in a waste container for solid wastes.

DON'T

- Pour FOG down the drain.
- Wash fryers/griddles, pots/pans, and plates/utensils until FOG is removed.
- Use hot water to rinse FOG off of surfaces.
- Use the drain as a means to dispose of food scraps.

The toilet is NOT a trash can!

Sanitary sewers are designed to handle human waste, toilet tissue, and approved industrial commercial wastes. But nonwoven materials such as disinfectant wipes and diapers cause problems. Although products may be labeled flushable, that does not mean they readily break down within the sewer system. These items can cause sewer overflows and damage pumps and other infrastructure.

Just because you can flush them doesn't mean you should!

"Flushable" products like wet wipes, baby wipes, pre-moistened towelettes, cleaning wipes, tissues, and paper towels can wreak havoc on your home plumbing, septic tanks, and our City sewer system. They create clogs and damage equipment. In your home, they can get caught at 45-degree elbows and cause backups. If they make it into the sewer system, they tend to obstruct pipes and lead to sewer overflows that impact streets, creeks, and streams. When an obstruction makes it all the way to one of our wastewater treatment plants, it can get trapped in the pumps and cause tens of thousands of dollars in damage.

Do your part: throw trash items in the garbage, not down the toilet.



Notice Under the Americans With Disabilities Act

The City of Durham will not discriminate against qualified individuals with disabilities on the basis of disability. Anyone who requires an auxiliary aid or service for effective communications, or assistance to participate in a City program, service, or activity, should contact the office of the ADA Coordinator, voice: 919-560-4197, TTY: 919-560-4809, or email: ADA@durhamnc.gov, as soon as possible but no later than 48 hours before the scheduled event.

Spills and Overflows from July 2019 to June 2020

Location	Date	Volume Discharged (gallons)	Cause	Remedy
24 Phauff Ct.	7/10/2019	850	Roots	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
658 Forge Rd.	7/11/2019	400	Grease/Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
22 Providence Ct.	8/6/2019	425	Roots	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
1400 Morreene Rd.	9/12/2019	1,000	Roots	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
10 Upchurch Cir.	9/17/2019	1,200	Pipe Failure	Crews repaired the main, remediated the spill site, flushed the creek, and pumped the untreated wastewater back into the collection system.
2328 Roda Dr.	9/26/2019	5,000	Pipe Failure	Crews repaired the main, remediated the spill site, flushed the creek, and pumped the untreated wastewater back into the collection system.
1616 Cooper St.	10/2/2019	10,000	Pipe Failure	Crews repaired the main, remediated the spill site, flushed the creek, and pumped the untreated wastewater back into the collection system.
2816 Ross Rd.	10/3/2019	12,000	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
3015 Weymouth St.	10/11/2019	80	Other (Unknown Blockage)	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
733 Rutherford St.	10/12/2019	1,925	Grease	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
3 Capri Ter.	10/26/2019	300	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.

Spills and Overflows from July 2019 to June 2020 (continued)

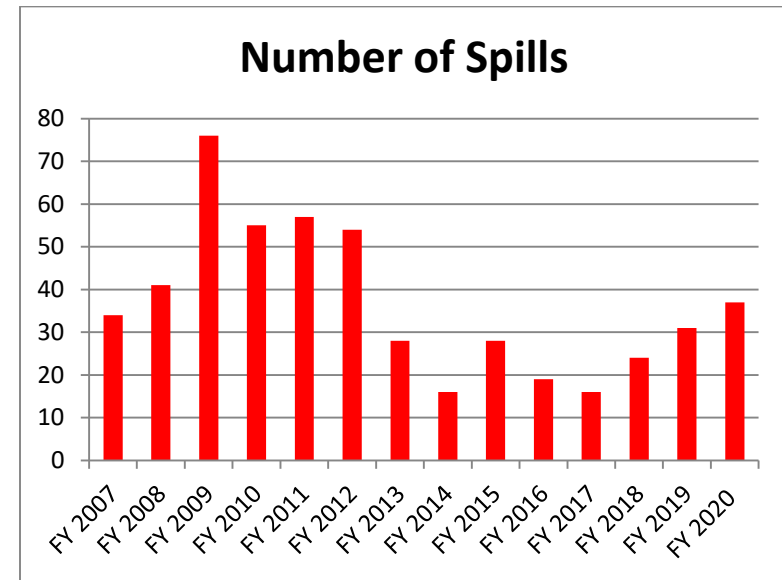
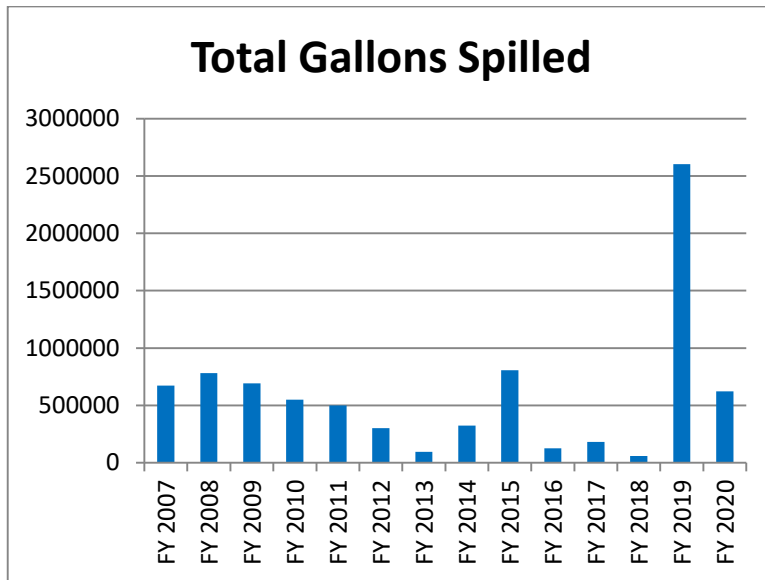
1805 Milan St.	10/27/2019	600	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
1012 Bluestone Rd.	11/5/2019	2,060	Debris in Line	Crews jetted the main, removed manhole insert, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
33 Jenee Ln.	11/16/2019	19,250	Debris in Line	Crews jetted the main, removed a tree limb, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
413 Farintosh Valley Ln.	11/25/2019	1,575	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
811 Arnette Ave.	12/5/2019	172	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
Duke University, Maxwell Ave. (Smith Warehouse, Bay 6)	12/9/2019	45	Debris in Line	Duke Maintenance contacted a contractor; did not go through City of Durham.
1201 Vintage Hill Pkwy.	1/8/2020	7,500	Pipe Failure	Crews shut down the pump station to repair the force main; vacuum trucks cleaned spill.
4023 Wake Forest Rd.	1/16/2020	7,400	Grease/Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
2321 Stroller Ave.	1/26/2020	970	Roots	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
904 Lambeth Cir.	2/4/2020	225	Other	Crews removed contractor plug, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
Rockwood Park	2/6/2020	168,075	Severe Weather	Heavy rain and winds started in the early morning on 2/6/2020 and continued through mid-morning the next day.
3201 Coachman Way	2/6/2020	24,050	Severe Weather	Heavy rain and winds started in the early morning on 2/6/2020 and continued through mid-morning the next day.
1912 Essex Rd.	2/6/2020	67,800	Severe Weather	Heavy rain and winds started in the early morning on 2/6/2020 and continued through mid-morning the next day.
3014 Sparger Rd. (Lift Station)	2/11/2020	3,000	Pump Station Equipment Failure	No solids were found from the wet well. The GFCI receptacle was reset and pumps were activated, eliminating the spill. This occurred during a rain event with heavy flow in associated unnamed tributary. Tested creek for ammonia and found nothing.

Spills and Overflows from July 2019 to June 2020 (continued)

707 West Murray Ave.	2/15/2020	18,370	Grease/Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
1101 Hamlin Rd.	2/17/2020	176,400	Pipe Failure	Crews repaired the pipe, remediated the spill site, flushed the creek, and pumped the untreated wastewater back into the collection system.
309 West Morgan St.	2/19/2020	4,000	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
2917 Salvone Ct.	2/21/2020	12,500	Vandalism	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
24 Phauff Ct.	2/21/2020	11,400	Vandalism	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
5210 Peppercorn St.	3/2/2020	3,250	Debris in Line	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
Hillandale Golf Course	3/12/2020	4,900	Grease	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
1600 Hillandale Rd.	3/29/2020	4,800	Grease	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
2624 Ross Rd.	4/4/2020	39,600	Debris in Line	Crews jetted the main, walked the ditch while checking ammonia levels, dammed the ditch and flushed with a diffuser to dechlorinate the water, then pumped the water back into the collection system.
1708 Woodburn Rd.	5/17/2020	264	Roots/Debris in Line	Blockage was cleared by a flush truck. Crews set up a pump downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
25 Phauff Ct.	5/29/2020	7,500	Debris in Line	Crews jetted the main, walked the ditch while checking ammonia levels, dammed the ditch and flushed with a diffuser to dechlorinate the water, then pumped the water back into the collection system.
3811 Vair St.	6/2/2020	1,500	Debris in Line	Crews jetted the main, walked the ditch while checking ammonia levels, dammed the ditch and flushed with a diffuser to dechlorinate the water, then pumped the water back into the collection system.

Spills and Overflows from July 2019 to June 2020 (continued)

822 East NC HWY 54	6/10/2020	3,275	Other	Crews jetted the main, remediated the spill site, dammed the creek downstream, flushed the creek, and pumped the untreated wastewater back into the collection system.
Total: 37		623,661		



It's important to note that a number of overflows come from blockages caused by "flushable" wipes. These products don't break down sufficiently and tend to obstruct pipes. If they travel all the way to one of our wastewater treatment plants, they become trapped in pumps and can cause tens of thousands of dollars in damage. We urge those who use wipes to place them in the trash