

Welcome to the City's eighth annual summary of the performance of Durham's sewer system. This report is developed to inform our customers about the sewer system while meeting 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 must summarize the treatment works' and collection system's performance over a twelve-month period. In addition to making the report available to all customers, the City also submits the summary to the North Carolina Department of Environment and Natural Resources.

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 *used* 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. At the plant, wastewater is treated by physical, biological and chemical processes before it is returned to the environment via receiving streams. The City is interested in the health of downstream users, both human and wildlife, and works to ensure that Durham's wastewater is processed and deemed safe for all. As a result of the 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 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 to inform the public are distributed by the end of the next business day after the occurrence.

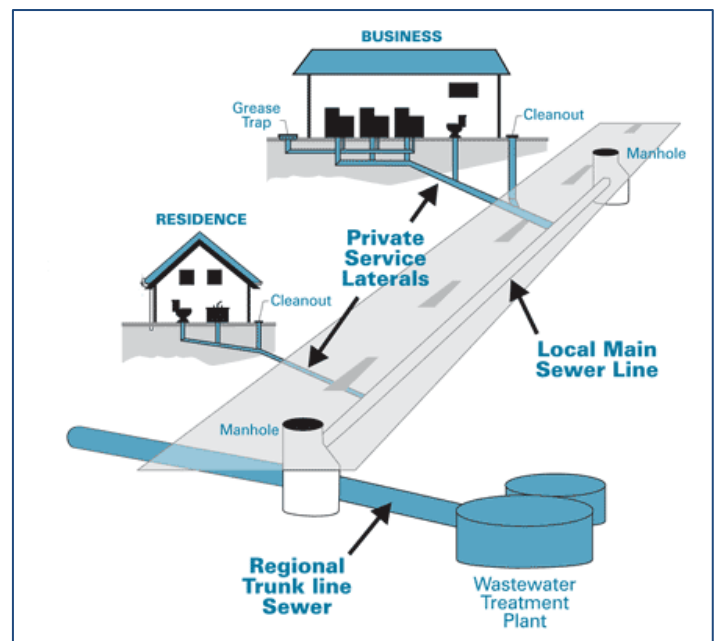


Figure 1: Simplified diagram of sewer system

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

Durham's Sewer System Facilities			
	Collection System	Water Reclamation Facilities	
Name of Facility	Operations Center	North Durham Water Reclamation Facility	South Durham Water Reclamation Facility
Permit number	WQCS00005	NCOO23841	NCOO47597
Address	1110 Martin Luther King Jr. Pky	1900 East Club Blvd.	6605 Farrington Rd.
Operator in Responsible Charge (ORC)	Tom Lucas	John Dodson	Robert Dodson
Phone number	919-560-4344	919-560-4384	919-560-4386

Down the Drain! Where does it go?

When wastes exit 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 in strategic areas 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 pump stations for the collection system are monitored and maintained by Plant Maintenance division staff.

Durham sits on a ridgeline that runs (loosely) along Pettigrew Street and the railroad tracks. Wastewater on the north side of the ridgeline flows to the North Durham Water Reclamation Facility (1900 E. Club Blvd) and is ultimately discharged into the Neuse River Basin. The South Durham Water Reclamation Facility (6605 Farrington Rd.) receives wastewater that flows south of the ridgeline. After processing, the discharge flows into the Cape Fear basin. Durham County owns and operates a third wastewater treatment plant that serves most of Research Triangle Park, Parkwood and a few other south Durham neighborhoods. The Durham County sewer system report is posted at www.co.durham.nc.us.

Collection System Performance

City departments continue to use the Geographical Information System (GIS) mapping of the collection system which provides an accurate method of tracking both operations and maintenance activities. Now, approximately 1200 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 sewer system.

In addition to the activities in the table (next page), crews inspected 1230 manholes, repaired/replaced 202 sewer services and responded to 606 blockages.

Maintenance Activities	
Activity	Linear Ft.
Lateral Service	33,265
Flushing	902,753
Inspections (TV'd)	512,944
Mains replaced	15,050
Easements mowed	604,520

Improper disposal of grease continues to be **the number one** cause of blockages in the sewer system. In fact, **67% of all blockages were caused by grease buildup in the lines.** Grease buildup is similar to plaque buildup in human arteries. Repeat blockages are a problem that city staff will focus additional resources on in the coming year. The City continues to promote 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 Program. Funding of infrastructure is a high priority of the department's Capitol Improvement Projects (CIP).

Water Reclamation Facility Plant Performance

The City's two treatment facilities – 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 average daily flow treated by the two plants was 17.28 MGD, with **no violations** of any applicable state and federal regulations at either of the City's two facilities. This volume represents approximately two million gallons less per day than was treated in the previous year, as customers responded to the drought with increased conservation.

Both North Durham and South Durham WRFs are implementing automated computer system upgrades (known as SCADA). These systems control plant processes and the upgrades will allow for better data handling and management. In addition, a new lab data management system will be implemented (OPS) to improve efficiency. These upgrades will be completed in FY 2009.

An optimization study was completed for both facilities. As a result, South Durham implemented operation changes and additional chemical feed systems for nutrient removal will be added. North Durham implemented operational changes as well, and a separate return sludge line will be installed as a result of the study. North Durham will also upgrade its ultraviolet disinfection process and a new aeration tank will be installed.

Reclaimed Water

The City of Durham was pleased to begin offering reclaimed water to customers after receiving our bulk reclaimed water permit in December 2007. Reclaimed water is available at no charge to customers who take at least 250 gallons directly from the North Durham WRF. Only customers that have completed the required training may obtain permits for bulk reclaimed water from the North Durham WRF.

The bulk reclaimed water project reduces the amount of drinking water that is required for non domestic purposes. While clean and safe for many uses, the law requires certain precautions for human contact. Reclaimed water can be used for irrigation, dust control, street sweeping and in decorative fountains, among other things. The City began using reclaimed water instead of potable drinking for sewer line flushing as well for irrigation in certain areas. To date, 373 individuals have been certified to haul and use reclaimed water.

Analytical Support

Most laboratory analyses are performed at the City's state-certified laboratory located at the South Durham Water Reclamation Facility site. In addition to providing lab support for the reclamation facilities, the laboratory provides analytical support for the Water Supply and Treatment Division, the City's Storm Water Program and the City's Industrial Pretreatment Program. While the Storm Water Division of the Public Works Department is charged with eliminating illegal discharges into the storm sewers, the Industrial Pretreatment Program manages industrial and non-residential discharges into the City's sanitary sewer system. Each year, lab staff members conduct approximately **74,000 analyses on 50 different test parameters** to ensure compliance with permits and for process control.

Industrial Pretreatment Program/Grease Reduction Initiative

Industrial Pretreatment Program staff survey facilities discharging into the sewer system and issue permits to facilities in certain categories, determined either by the type of business activity they conduct or the type(s) of waste discharged from their facility. Permit limits are established based on the ability of the receiving treatment plant – either the North Durham Water Reclamation Facility or the South Durham Water Reclamation Facility – to assimilate, treat and remove substances from the waste. Currently, staff monitors thirteen significant industrial users and hundreds of commercial establishments with high-strength discharges.

To help in the effort to reduce grease blockages in the sewer system, the Industrial Pretreatment Program staff coordinates the education and inspection portion of the grease reduction initiative. Grease enters the sewer system from both household drains as well as poorly maintained grease traps in restaurants and other food service establishments. To meet the 250 mg/L limit for FOG (fats, oil and grease), food preparation and/or processing facilities must clean their removal systems (grease traps) on a monthly basis. More frequent cleaning will be required if



Figure 2: Grease can be poured directly into a Fat Trapper with a sealable liner.

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 removal records must to 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 – at no extra cost to citizens – a collection container for used cooking oil at the Waste Disposal and Recycling Center at 2115 East Club Boulevard. The Industrial Pretreatment Program distributes small residential grease collection units called Fat Trappers. Customers can call 560-4386 and ask for Pretreatment staff for more information on the Fat Trapper.

SPILLS AND OVERFLOWS FROM JULY 2007 THROUGH JUNE 2008

LOCATION	DATE	VOLUME Gallons discharge	VOLUME Gallons to creek	CAUSE	REMEDY
Cheek Rd & Midland Terrace	07/01/07	48	48	Grease Blockage	Cleaned and Tved main line
Sawmill Pkwy & Vintage Hill Pkwy	07/07/07	500	0	Spill from Jet/Vac Tank	Repaired truck holding tank gasket
5202 Reams Run Rd	07/09/07	50,000	50,000	Grease blockage	Cleaned and Tved main line
Erwin Road & Fulton Street	07/24/07	750	750	Blockage of rags	Cleaned and Tved main line
3812 Darby Road	07/31/07	50	50	Blockage of roots	Cleaned/Sawed Roots/Tved main line
4121 Trotter Ridge Road	08/06/07	100	100	Blockage of grease/rags	Cleaned and Tved main line
Rosedale Ave & Gunter Street	08/07/07	3,000	3,000	Grease blockage	Cleaned and Tved main line
Bedford Street & Nations Avenue	08/07/07	4,300	4,300	Blockage of grease/roots	Cleaned/Sawed Roots/Tved main line
1300 Juniper Street	08/09/07	13,000	13,000	Blockage of grease	Cleaned and Tved main line
1805 Fidelity Street	08/23/07	1,500	1,500	Blockage of grease/rags	Cleaned and Tved main line
718 Grandview Drive	09/03/07	900	900	Blockage of grease/rags	Cleaned and Tved main line
700 Big twig Lane	09/04/07	1,500	1,500	Grease Blockage	Cleaned and Tved main line
Muldee Street & Cheek Road	09/09/07	13,000	13,000	Blockage of rags	Cleaned and Tved main line
102 E.Murray Avenue	09/11/07	50	50	Blockage of roots/rags	Cleaned/Sawed Roots/Tved main line
University Drive & James Street	09/13/07	100	100	Grease Blockage	Cleaned and Tved main line
2108 Pershing Street	10/01/07	9,000	9,000	Blockage of roots/pipe failure	Cleaned and Tved main line - Replaced 6' of line
1919 Wilshire Place	10/04/07	100	100	Blockage of roots	Cleaned/Sawed Roots/Tved main line
1615 Infinity Road	10/16/07	3,000	3,000	Pump Station Failure	Bubbler system repaired
218 Alexander Street	10/15/07	800	800	Grease blockage	Cleaned and Tved main line
506 E.Forest Hills Blvd	10/19/07	100	100	Grease blockage	Cleaned and Tved main line
1035 Sherwood Drive	11/11/07	7,200	7,200	Vandalism	Bolt down frame & cover installed
401 Case Street	11/20/07	14,400	14,400	Blockage of grease/roots	Cleaned/Sawed Roots/Tved main line
Duke University Rd & Swift Ave	11/22/07	6,000	6,000	Grease blockage	Cleaned and Tved main line
Keystone Place Pump Station	11/26/07	36,000	36,000	Grease blockage	Cleaned and Tved main line
1904 Birmingham Avenue	12/04/07	400	400	Blockage of roots	Cleaned/Sawed Roots/Tved main line
3 Enzo Circle	12/07/07	14,000	14,000	Blockage of grease/rags	Cleaned and Tved main line
5 Beckham Place	12/08/07	900	100	Blockage of grease/roots	Cleaned/Sawed Roots/Tved main line
1004 Cheviot Court	12/08/07	7,200	4,000	Blockage of grease/rags	Cleaned and Tved main line
Swift Avenue & Pettigrew Street	12/12/07	600	600	Blockage of grease/rags	Cleaned and Tved main line
5216 Penrith Drive	12/14/07	1,200	1,200	Grease blockage	Cleaned and Tved main line
117 Milton Road	12/20/07	1,200	1,200	Blockage of roots	Cleaned/Sawed Roots/Tved main line
5028 Butternut Road	12/24/07	700	700	Blockage of rags	Cleaned and Tved main line
2809 Dark Circle	12/31/07	2,400	2,400	Grease blockage	Cleaned and Tved main line
Nixon Street Dead End	01/02/08	36,000	6,000	Grease blockage	Cleaned and Tved main line
500 Hardee Street	01/06/08	5,700	5,700	Grease blockage	Cleaned and Tved main line
Morehead Avenue & Burke Street	01/13/08	500	500	Grease blockage	Cleaned and Tved main line
3431 Dover Road	01/15/08	500	500	Blockage of grease/roots	Cleaned/Sawed Roots/Tved main line
Duke University Rd & Oregon St	01/16/08	1,800	1,800	Blockage of grease/roots	Cleaned/Sawed Roots/Tved main line
933 Belvin Avenue	01/24/08	500	500	Grease blockage	Cleaned and Tved main line

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LOCATION	DATE	VOLUME Gallons discharge	VOLUME Gallons to creek	CAUSE	REMEDY
1614 Alcott Street	01/27/08	1,800	1,800	Blockage of grease/rags	Cleaned and Tved main line
Main Street & Gary Street	01/30/08	141,000	141,000	Grease blockage	Cleaned and Tved main line
2721 Thelma Street	01/31/08	1,000	1,000	Grease blockage	Cleaned and Tved main line
314 Reynolds Avenue	02/02/08	900	900	Blockage of roots/rags	Cleaned/Sawed Roots/Tved main line
Chapel Hill Blvd & Tower Blvd	02/07/08	250	60	Grease blockage	Cleaned and Tved main line
530 Hardee Street	02/07/08	8,600	8,600	Blockage of grease/rags	Cleaned and Tved main line
1801 Williamsburg Road	02/07/08	30,000	30,000	Blockage of grease/rags	Cleaned and Tved main line
1629 Cole Mill Road	02/08/08	50	25	Blockage of debris	Removed broken clean out cap & flushed service
118 Lake Shore Drive	02/09/08	9,600	9,000	Grease blockage	Cleaned and Tved main line
800 Fargo Street	02/19/08	8,600	8,600	Blockage of grease/rags	Cleaned and Tved main line
1400 Morreene Road	02/19/08	30,000	30,000	Blockage of grease/rags	Cleaned and Tved main line
433 Murray Avenue	02/22/08	14,400	14,400	Blockage of rags	Cleaned and Tved main line
Woodcroft Parkway Clubhouse	02/27/08	3,000	3,000	Grease blockage	Cleaned and Tved main line
217 S.Mangum Street	03/03/08	500	500	Grease blockage	Cleaned and Tved main line
Bacon Street & Lantern Place	03/06/08	3,600	3,600	Grease blockage	Cleaned and Tved main line
4144 Wallingford Place	03/10/08	30,000	30,000	Blockage of grease/rags	Cleaned and Tved main line
Geer Street & Milan Street	03/14/08	14,000	14,000	Blockage of grease/rags	Cleaned and Tved main line
707 Obsidian Way	03/27/08	36,000	36,000	Pipe Failure	Cleaned and Tved main line - Replaced 31' of DIP
2816 Ross Road	04/02/08	13,000	13,000	Blockage of grease/rags	Cleaned and Tved main line
608 W.Club Blvd	04/09/08	200	200	Blockage of grease/rags	Cleaned and Tved main line
1205 Oval Drive	04/15/08	200	200	Grease Blockage/Leaking Joint	Cleaned and Tved main line – Repaired Joint
313 Foster Street	04/24/08	200	200	Blockage of debris	Cleaned and Tved main line
608 Yancey Street	04/29/08	5,000	5,000	Pipe Failure	Cleaned and Tved main line - Replaced 14' of line
1729 Euclid Road	04/30/08	500	600	Blockage of roots	Cleaned/Sawed Roots/Tved main line
MLK Jr. Parkway & Cher Drive	04/30/08	10,000	5,000	Grease blockage	Cleaned and Tved main line
609 Melbourne Street	05/05/08	13,000	13,000	Vandalism	Bolt down frame & cover installed
608 Yancey Street	05/08/08	700	700	Pipe Failure	Replaced 10' of VCP with DIP
1500 Mathison Street	05/10/08	13,000	13,000	Blockage of grease/rags	Cleaned and Tved main line
1209 Lincoln Street	05/12/08	8,600	8,600	Blockage of grease/rags	Cleaned and Tved main line
5320 Newhall Road	05/12/08	20,000	20,000	Blockage of roots/rags	Cleaned/Sawed Roots/Tved main line
1217 Sedwick Road	05/19/08	1,200	1,200	Blockage of grease/roots	Cleaned/Sawed Roots/Tved main line
6412 Forrest Ridge Drive	05/20/08	180	100	Grease blockage	Cleaned and Tved main line
2702 Lindbergh Street	05/27/08	8,600	8,600	Blockage of roots	Cleaned/Sawed Roots/Tved main line
2509 Fairlawn Road	06/15/08	500	500	Blockage of roots/rags	Cleaned/Sawed Roots/Tved main line
2613 Owen Street	06/16/08	14,400	10,000	Grease blockage	Cleaned and Tved main line
1321 Newcastle Road	06/26/08	8,640	8,640	Grease blockage	Cleaned and Tved main line
3730 Hermine Street	06/30/08	500	250	Blockage of roots	Cleaned/Sawed Roots/Tved main line

Total Number of Spills = 76

Total Volume = 690,718 Gallons