

# ROANOKE RAPIDS SANITARY DISTRICT

1000 Jackson St., Roanoke Rapids, NC 27870

Wastewater Treatment Plant 536-4884  
Collection System 537-9747  
Administrative Office 537-9137  
Pay-By-Phone (888) 626-9056



Board of Commissioners:  
P. W. Heaton, Jr., Chairman  
J. D. Bailey, Secretary  
E. J. St. Clair, Member

PERMITS:  
NPDES - NC0024201  
LAND APPLICATION - WQ0001989  
LAB - NC70  
COLLECTION SYSTEM - WQCS00027

Administrative Officers:  
Dan Brown, P.E., CEO  
Calvin Potter, Finance Officer  
Gregg Camp, ORC, WWTP  
Gregg Wilson, Supervisor, Collection Sys.

## 2013 Wastewater System Report [www.rrsd.org](http://www.rrsd.org)

### MISSION STATEMENT

**To affordably provide the highest quality water services; safely collect wastewater and return clean water to the environment while promoting public trust and partnerships to the benefit of our associates and satisfaction of our customers.**

The Roanoke River Wastewater Treatment Plant (WWTP) operated by the Roanoke Rapids Sanitary District (RRSD) treats wastewater from Roanoke Rapids, Gaston, Halifax County and Northampton County. Wastewater from industry, businesses, and homes enters collection system pipes and flows to the WWTP. Harmful pollutants, as determined by the North Carolina Division of Water Quality (DWQ), are removed by the treatment process. The public health and environment is protected through the discharge of high quality wastewater to the Roanoke River. Cost effective treatment is performed to maintain reasonable rates for customers of the RRSD.

DWQ has determined wastewater includes conventional and non-conventional pollutants. Conventional pollutants contain suspended solids from fecal matter or food. Non-conventional pollutants contain dissolved metals like copper and zinc. Pollutants can come from organic sources such as plant or animal origin or inorganic sources such as mineral origin. All pollutants combined and entering the treatment facility are called plant loading. Plant loading comes from two sources; controllable (industrial) and non-controllable (residential). Residential wastewater must meet RRSD's general use ordinance. It prohibits such items as petroleum products, toxic substances and cooking grease.

#### ROANOKE RIVER WWTP FUN FACTS

- Location: 135 Aqueduct Road; Weldon, NC 27890
- DWQ Plant Classification: IV (Largest State Classification)
- Hours of Operation: 24 hours a day, 365 days a year  
(Note: DWQ requires a licensed operator onsite at all times)
- Year Constructed: 1963.
- Treatment & Flow Capacity Expansion: 1983
- Original Design Capacity: 5.5 Million Gallons per Day (MGD)
- Current Design Capacity: 8.34 MGD
- Design Peak Flow: 12.5 MGD
- Treatment Type: Secondary Biological
- 2013 Average Daily Flow (ADF): 3.6 MGD
- 2013 ADF Range: 2.6 MGD to 6.9 MGD
- 2013 Minimum Flow: 2.1 ; 2013 Peak Flow: 14.4 MGD
- NPDES Permit Effective Period: 2012 – 2017
- Number of Employees: 13 (including eight Licensed Operators)
- Departments: Operations, Certified Laboratory, and Maintenance
- Year Clean Water Act Passed: 1970 (EPA established)

#### EN ESPANOL

- El informe contiene informacion importante sobre la
- calidad del agua residual en su comunidad. Traduz-
- calo o hable con alguien que lo entienda bien.

**Permit Violations** - In 2013 there were four permit limit violations, no monitoring and one reporting violation. **November:** One data point omitted reporting violation. TSS weekly violation = 54.81 (Permit limit = 45 mg/l) TSS monthly violation = 34.7 (Permit limit = 30 mg/l) % monthly removal = 82.2% (Permit limit = 85%)

**December:** TSS monthly violation = 38.83 mg/l (Permit limit = 30 mg/l) % monthly removal violation = 78.9% (Permit limit = 85%) Weekly Fecal Coliform = 502 colonies/100 ml (Limit = 400)

The State did not cite us for failing to achieve 85% removal for November or December. pH, Residual Chlorine & WET parameters were met.

**Bypasses** - All bypasses must be reported, by phone, to DWQ within 24 hours of first knowledge. A written report must follow within 5-days with corrections. In 2013 there were five bypasses: 5/21, 956,400 gallons; 2-events on 6/7, 260,000 gallons; 2-events on 12/29, 64,200 gallons, due to heavy, intense rainfall.

**Bypass Control** - Wastewater that comes into the plant faster than can be treated due to storms is stored in two tanks capable of holding approximately 750,000 gallons. These two tanks are also used when maintenance on plant equipment requires draining and holding wastewater. In 2013 approximately 5,468,491 gallons were stored and returned to the plant from various high flow events and maintenance projects. At an ADF of 3,600,000 gallons in 2013 this is over a whole day's worth of flow prevented from bypassing. Since use of these tanks began in 2000 55,201,158 gallons of wastewater has been prevented from bypassing. At the 2013 ADF of 3,600,000 this would be 15.3 days of flow. A full load diesel generator is used prevent bypasses during a power outage. In 2013 there were 3-power outages. The total time of power outage for all three events was three hours. A total of 938,882 gallons were prevented from bypassing without normal power supply.

**NPDES Permit Limits**

Effluent Parameter	Weekly	Monthly	2013 Actual
TSS	45 mg/l	30 mg/l	18.7 mg/l
CBOD	37.5mg/l	25 mg/l	5.3 mg/l
Fecal Coliform	400 colonies	200 colonies	30 colonies

ph = continuous monitoring must be between 6.0 and 9.0 units.  
 Residual Chlorine = continuous monitoring must be less than 50 ppb.  
 WET = quarterly testing must be Pass.  
 Note: - Permit requirements for TSS & CBOD removal are 85%.  
 - Also test only/no limit parameters include nitrogen, phosphorus, dissolved oxygen & metals such as chromium & mercury.



**The District uses New Vacuum Truck to Clean Sewer Line**

**Collection System** - The collection system consists of six pump stations and 130 miles of sewer pipes connecting homes and businesses to the WWTP. Main sizes are 8 inches in subdivisions and 12 to 30 inches along the river and creeks. The oldest pipes have been in the ground and in use since before 1930. During 2013 over 31.87 miles of sewer lines were TV inspected and cleaned; 19 miles (approximately 69 acres) of outfalls and cross country lines were cut and cleared by RRSd. In 2013 we had 10 reportable Sanitary Sewer Overflows (SSO) at six locations; totaling 223,050 gallons. In 2013, RRSd purchased a new Vac-con truck, rehabbed 290 ft. section of 8" clay pipe, rehabbed 18-manholes, applied Root Control treatment on 9,293 ft. of line and rebuilt our Hwy 48 lift station. During 2013 District employees performed 5 point repairs on sewer lines:

1. 1336 Williams St. - replaced 5ft. of 8" sewer line with PVC.
2. 608 Carolina St. - replace 8ft. of service line with DIP.
3. Fairfield Apartments - replaced 5 ft. of sewer line with PVC.
4. South Bay St. - replaced 24 ft. of sewer line with DIP over storm drain.
5. 344 East Littleton Rd. - replaced 6 ft. of sewer with PVC.

- **HYDRO-PAY - 537-9137**
- **ONLINE BILL PAY - www.rrsd.org**
- **PAY-BY-PHONE - (888) 626-9056**



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The Roanoke Rapids Sanitary District takes great pride in providing its customers with a Water and Wastewater system that runs smoothly. Our Board and Management team insist that we put customer service as a top priority.

The District invests significant resources in manpower and assets to provide modern equipment to help meet the needs of the Department to provide good customer service. We have recently purchased a new Vac-con truck to jet and clean grease and debris from our some 130 miles of sewer lines and to keep our lift stations clear of debris so they can operate normally. We also have updated our Camera Van with Modern equipment to better see problems in our sewer mains. We have purchased a valve exerciser and excavator to help keep our water main valves working smoothly, so if we have a break we can stop the flow and we can also detect any broke valves in our system.

Our employees have been trained to operate this new equipment safely and have been trained in traffic control to minimize any inconvenience the public. We have been accepted into the Star Program by the North Carolina Dept. of Labor and we are striving to keep the public and our employees' safe by reducing or trying to eliminate accidents.

### **How a Sewer System Works**

A typical sanitary sewer is constructed of pump stations and a network of below ground pipes connected to each building or residence that is used to transport sewage to a wastewater treatment plant. A property owner's sewer pipes are called private service laterals and connect to the public sewer lateral, local mainline and regional trunk lines. Operation and maintenance of the public lateral, mainlines and regional trunk lines are the responsibility of the Sanitary District.

### **What is a Sewage Overflow**

A sanitary sewer overflow (SSO) is any overflow, spill, release, discharge or diversion of wastewater from a sanitary sewer system. SSO's include: (i) overflows or releases of wastewater that reach waters of the State; (ii) overflows or releases of wastewater that do not reach waters of the State; and (iii) wastewater backups into buildings and on private property that are caused by blockages or flow conditions in a sanitary sewer, other than a building lateral. Wastewater backups into buildings caused by a blockage or other malfunction of a building lateral that is privately owned is a SSO when sewage is discharged off of private property into streets, storm drains, or waters of the State.

### **Common Causes**

Grease builds up inside and eventually blocks sewer lines. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors. Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps, or undersized sewers can cause blockages. Grease and root intrusion are the most common cause of pipe blockages. Infiltration and inflow happen when groundwater or rainwater enters the sewer system through pipe defects and illegal connections. Pipes are not large enough to carry rain water along with wastewater and this can cause wastewater to back up in a system.

### **What to look For**

Sewage spills can be very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed.

Look for:

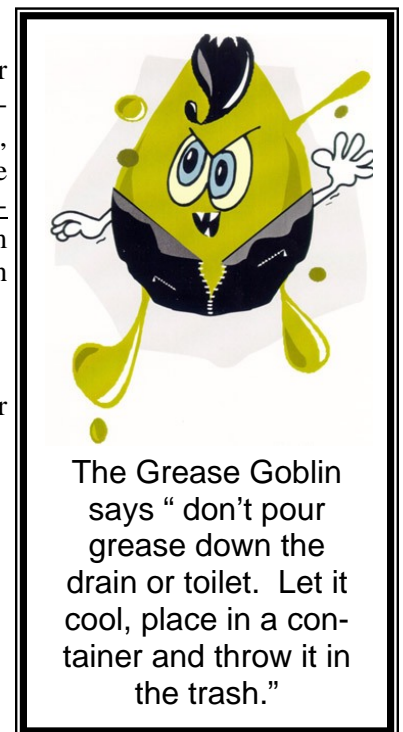
- Drain backups inside the building.
- Wet ground and water leaking around manhole lids on your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls, ground around a building

### **How you can prevent Sewage Spills**

- Never put grease down garbage disposals, drains or toilets.
- Perform periodic cleaning to eliminate grease, debris and roots in your sewer lateral.
- Repair any structural problems with your sewer system.

### **CAUTION!**

Keep people and pets away from the sewer spill area. Untreated sewage has high levels of disease-causing viruses and bacteria.



**If the Sanitary District can help in anyway. Please call us at 252-537-9747**

## WASTEWATER PROGRAMS AND SERVICES

**Pretreatment Program** - The pretreatment program monitors local industries that discharge a controllable load. Overloading may interfere with the WWTP or cause pass through of the plant of a pollutant. The plant capacity to treat pollutant loading from controllable and uncontrollable sources is known from plant design capacity; verified by the results of certified lab testing. Available pollutant loading may be allocated to industry or left in reserve for future growth. Just as DWQ issues RRSd a permit to limit our discharge to the Roanoke River; RRSd issues industry permits to limit discharge to the WWTP.

**FOG Program** - Fats, Oils and Grease (FOG) are a controllable load discharged by restaurants or homeowners. The program is regulated by Ordinance as a condition of the Collection System Permit issued under a DWQ administrative order to reduce SSOs ( Sanitary System Overflows). One full time employee is responsible for public education, enforcement and inspection of grease traps. Placing ads in newspapers and distributing brochures to restaurants help educate the public about both the monetary and environmental benefit that the elimination of FOG has on the District. In addition to homeowner plumbing bills and collection system costs, FOG loading interferes with WWTP processes.

**Bio-Solids Program** - Removal of TSS and CBOD by the wastewater treatment process produces solids, which must be treated using anaerobic digestion and lime stabilization to reduce harmful pathogens. The anaerobic digestion process heats primary solids to 95° F with mixing in the absence of oxygen. Lime stabilization raises the pH of secondary solids to 12.0 for a specified period of time. Thousands of tests are performed annually on residual solids to ensure regulated levels of treatment are met. In 2013, approximately 3,831,600 gallons of solids were stabilized. Once stabilized, solids can be land applied for its nutrient value, moisture content, and soil amendment properties. DWQ issued RRSd a 5-year

**Land Application** permit in 2007 that authorizes the District to safely manage the application of bio-solids. The District has over 3,100 acres permitted with local area farmers for this program. There are periods when crop rotations or weather conditions prevent land applying bio-solids. In 2004, the District purchased 150 acres of pasture land for bio-solids application. In 2013, 1,004,000 gallons were applied to the site. The site is developed as a model site with the help of the Soil Conservation Service. Trees have been cut, areas fenced off and buffer zones created.



## DEFINITIONS

- I/I - Inflow of rain water or water from swollen creeks. Infiltration of ground water into old deteriorated collection system pipes. Excess I/I is expensive to treat at the WWTP and uses valuable capacity reserved for future economic development. *It is a violation of the Sewer Use Ordinance to connect roof drains or basement water pumps to the wastewater collection system.*
- NPDES - DWQ issues RRSd a National Pollutant Discharge Elimination System permit, which is reviewed and approved by the Environmental Protection Agency (EPA). During the next five years DWQ will do extensive testing not only on the waters of the Roanoke River but also its aquatic life to validate the limits that must be met in the NPDES permit.
- PPA - Priority Pollutant Analysis tests for dozens of wastewater contaminants. Conventional (oil & grease), Metals (lead) Volatile organic (benzene) Acid-extractible (phenol) & Base neutral (fluorene). EPA has determined these to be harmful to the WWTP. Elevated levels of the constituents can cause permit violations. They must be removed.
- CBOD - Carbonaceous Biochemical Oxygen Demand represents the Biological Oxygen Demand (BOD) from organic compounds and oxidation of inorganic compounds like ferrous iron and sulfide. Any BOD from nitrifying organisms, which consume oxygen in the nitrification process of converting ammonia to nitrate, is removed by adding a nitrification inhibitor. Effluent is tested for CBOD daily and the results are reported to DWQ monthly. Over 97% of CBOD in the wastewater is removed.
- TSS - Total Suspended Solids include all particles suspended in water which will not pass through a filter. Suspended solids are present in residential wastewater and many types of industrial wastewater. Effluent is tested for TSS daily and the results reported to DWQ monthly. Over 94% of the TSS in the wastewater is removed.
- Effluent - Treated wastewater discharge into a receiving stream which is the Roanoke River.
- Bypass - Incomplete treatment of wastewater into the Roanoke River. Considered as a spill.
- WET - Whole Effluent Toxicity refers to the total toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater (effluent). RRSd uses the "Pass or Fail" Chronic Toxicity test procedure and it is one way EPA implements the Clean Water Act's prohibition of the discharge of toxic pollutants in toxic amounts. Quarterly WET tests measure our wastewater's effect on the water flea's (*Ceriodaphnia Dubia*) ability to survive, grow and reproduce.
- mg/l - A milligram per liter of water is equivalent to 1 ppm (part-per-million) because a liter of water weighs 1,000 grams and a milligram is 1 one thousandth of a gram. 1 ppm = 1 drop of gas in an auto gas tank or one minute in two years.\*
- ppb - A part-per-billion is equivalent to 1 microgram (ug/l) per liter of water. 1 ppb = one second of time in 32 years or about one drop of water in a swimming pool.\*

\*Analogies are used to help people understand the magnitude of a concentration; not to minimize the risk of a concentration-its effect on human health or the environment