

We are pleased to present this year's Wastewater Annual Report to you . . .

The Clean Water Act of 1999 passed by the North Carolina General Assembly requires wastewater collection or treatment systems to provide an annual report to their customers. This report summarizes the performance of the New Bern Wastewater Collection System and Wastewater Treatment Plant (WWTP) during the 12-month period from January 1, 2008 to December 31, 2008.

System Performance

The North Carolina General Assembly in the Clean Water Act of 1999 also requires municipalities, animal operations, industries and others who operate waste handling systems to issue news releases when a 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.

During the past twelve months, there were a total of 44 overflows of the New Bern Collection System. The Collection System is made up of the pipes and pump stations that transport the wastewater to the treatment plant. Six of these overflows were due to grease and debris in the sewer lines. Fifteen overflows were due to material and equipment failure. Twenty-two of the overflows were due to damage by contractors and others. Five of the total overflows reaching surface waters were in excess of 1,000 gallons. There were no overflows in excess of 15,000 gallons. Overflows were reported in accordance with State regulations to North Carolina Division of Water Quality.

The Wastewater Treatment Plant treated approximately 1.34 billion gallons of wastewater in 2008. The monthly average flow was 111.7 million gallons and the daily average was 3.72 million gallons. The peak flow of 6.60 million gallons per day was recorded on September 26, 2008. The plant was compliant for all monitoring permit requirements for the twelve months. The annual removal rate was greater than 99.2 % for oxygen demanding pollutants or 1332 tons for the year. The average biological oxygen demand for the effluent was less than 2 part per million. The annual removal rate was greater than 99.5 % for total suspended solids or 1156 tons for the year. The average annual total suspended solids for the effluent was less than 1 part per million. Approximately 724 million gallons were discharged to the quarry for reuse and 532 million gallons were discharged to the river.

Water Reclamation

Approximately 724 million gallons or 55.6 % of the annual treated wastewater went to the quarry. The reuse water containing nutrients was used to irrigate

a sod farm. This reduced the nutrient loading to the river. Two important nutrients that pollute our rivers are nitrogen and phosphorus. The reuse water reduced annual nitrogen loading to the river by 31,489 pounds and annual phosphorus loading by 7,606 pounds.

In addition to the main treatment facility, the City operates a smaller facility, New Bern Seven. The system operates under a separate permit. It utilizes a different process than the main treatment plant and its effluent goes to storage lagoons. The water in these lagoons is entirely reuse water. It is sprayed on a tree farm owned and operated by the City. Approximately 144 million gallons were treated by this facility last year and 122 million gallons were sprayed on the farm.

Pretreatment Program

Industrial sewage may contain significant quantities of toxic pollutants and other substances. These pollutants may interfere with the wastewater treatment system. Industries are required to provide treatment of process water to remove any such pollutants. The City in a Pretreatment Program supervises industries. The Program regulates and monitors the discharge from industries that enter the sewer system. There are seven industries permitted by the City, Moen, Chatsworth, BSH Dishwasher, BSH Laundry, BSH Range, Maola Milk and Ice Cream and Coastal Regional Solids Waste Management.

The Treatment Process

Wastewater treatment uses physical, biological and chemical processes to remove pollutants from water so it can safely be returned to the environment.

PRELIMINARY TREATMENT

Water passes through screens to remove large, non-degradable objects. A grit removal system eliminates sand and grit. A flow metering device provides flow data for operation of plant processes.

SECONDARY TREATMENT

The wastewater is then divided between two Biological Treatment Units (BTU).

- The wastewater enters a *fermentation stage* and mixes with return activated sludge from the secondary clarifier. The microorganisms in this environment release phosphorus from their cells.
- The next stage is the *first anoxic stage*, devoid of dissolved oxygen. Denitrifying microorganisms will use oxygen available in nitrates and release nitrogen gas.

- The wastewater then enters the biological oxygen demand/nitrification stage or a *carousel*. Dissolved oxygen is supplied in this stage for aerobic bacteria to accomplish three objectives. These microorganisms stabilize oxygen demanding organic material, nitrify ammonia to nitrates and nitrites, and remove phosphorus.
- Wastewater from this stage goes to the *second anoxic stage* where more denitrification takes place.
- The wastewater is *aerated* to further strip nitrogen gas, oxidize remaining ammonia and prevent the release of phosphorus.
- The discharge from the BTU enters two *secondary clarifiers*. These units provide a quiescent environment, which allow solids to settle. The settled material contains the nutrient laden microorganisms. Some of this material is circulated to the beginning of the BTU to provide microorganisms for the processes and a portion of the material is wasted or removed from the system. The clear water passes on to the next step.

TERTIARY TREATMENT

The effluent passes through a *deep bed filter system* to further polish the water. The material removed by the filters goes back into the system.

DISINFECTION AND DISCHARGE

The clear effluent is *disinfected* using liquid chlorine. Since chlorine is toxic, sodium bisulfite is used to remove all traces of the chemical. The wastewater is aerated in the final step. The effluent is discharged through *diffusers* to the Neuse River or to the City Water Reclamation Quarry.

Solids Handling

Solid material is removed from various stages of wastewater treatment. The material removed by the preliminary fine screen and grit removal system is not biodegradable. These items are washed and placed in a dumpster for sanitary disposal. The biodegradable solids (sludge) removed from the wastewater clarifiers go to three aerated sludge tanks. The combined volume of the three tanks is 1.0 million gallons. This slurry contains only 2% solids. The material has to be thickened. It is aerated until it is coagulated with polymer and applied to a belt filter press to remove water. Approximately 44.56 million gallons were pressed in 2008. The dewatered sludge is still unstable and hazardous. It then goes through pasteurization. It enters a thermo blender and sludge/lime mixer.

Quicklime is added and raises the sludge pH to above 12. The chemical reaction produces heat. Still additional heat is needed for pasteurization. It is supplied by the electrical heat system of the thermo blender. The final sludge product resembles soil. It is used for fertilizer for farmland and home gardens. The City produced 5312 tons of sludge that was used by local farmers. The City monitors the sludge and its usage in accordance with the North Carolina Division of Water Quality 503 Regulations for Sewage Sludge.

Education

The City of New Bern has an active educational campaign. Each year we welcome students who visit and tour the Wastewater Treatment Plant as part of their education. Our state-of-the-art treatment facility offers a wonderful opportunity for students to see how biology and chemistry applies to wastewater treatment. We also host tours for civic organizations and individuals interested in how the plant operates. For further information or to schedule a tour, please call 252.639.7556.

Information Available

If you have any questions about this report or concerning your water utility, please contact the Wastewater Treatment Plant at 252.639.7556 or the Wastewater Laboratory Supervisor at 252.639.7559. If you want to learn more, attend any of the regularly scheduled Board of Aldermen Meetings. They are held on the second and fourth Tuesdays of each month at 7:00 p.m. in the City Hall Courtroom, 300 Pollock St.

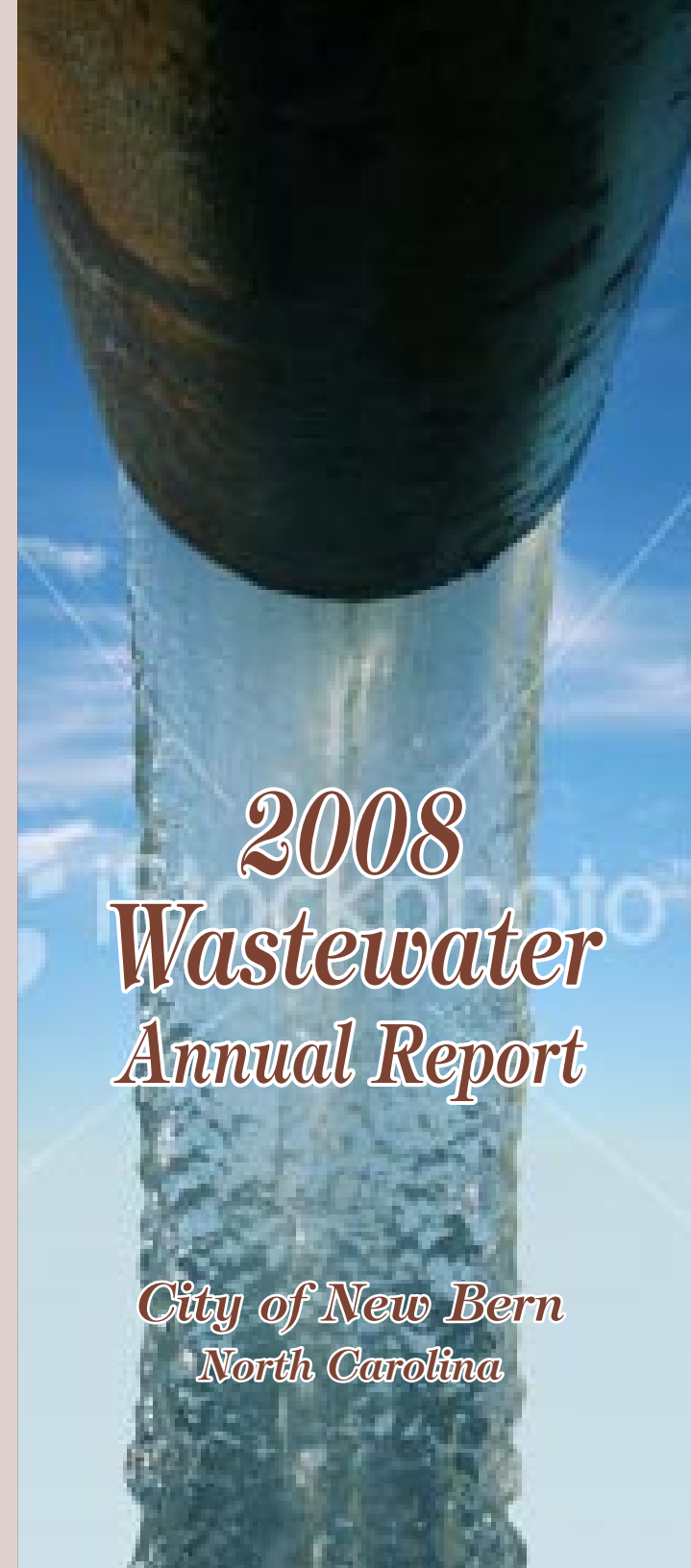
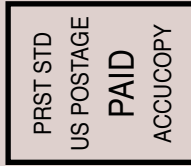
Oil and Grease

Thirteen percent of the wastewater overflows for the collection system this past year were due to grease build up in sewer lines. Grease traps that service restaurants are being inspected annually. In addition, restaurants are required to submit proof of grease trap clean outs. Restaurants are being fined for violating the Sewer Ordinance. You can also take part in the reduction of grease build up in sewer lines by collecting fat, oils and grease in a container and disposing of it in the trash. Do not pour fats, oils and greases down the drain. Material that is non-degradable placed in the sewer system encourages the build up of grease. Place these articles in the trash. Remember, proper disposal of trash saves YOU, the tax payer money!

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Return Service Requested



2008 Wastewater Annual Report

*City of New Bern
North Carolina*