

# TOWN OF APEX 2010 – 2011 ANNUAL WASTEWATER REPORT

The Town of Apex is pleased to provide this annual performance report on the operation of your Municipal Water Reclamation Facility and Wastewater Collection System.

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Report Covers Fiscal Year  
July 1, 2010 - June 30, 2011

NPDES Permit:  
NC0064050

Collection System Permit:  
WQCS00064

Biosolids Land Application Permit:  
WQ0001060

Reuse Water Permit:  
WQ0021863

**Water Reclamation Facility (WRF):** The WRF is designed to treat an average of 3.6 million gallons of wastewater a day. This past fiscal year over 824 million gallons were treated, with an average of 2.26 million gallons per day. The facility is designed to remove BOD, TSS, ammonia, phosphorus, and bacteria and viruses from its discharge. Critical equipment is monitored 24 hours a day with a computerized data acquisition system. The facility is also equipped with three standby generators.

The WRF provides preliminary treatment which involves debris screening and grit removal; secondary treatment where biological treatment occurs and nutrient removal; tertiary treatment that removes much of the residual suspended matter and finally it is disinfected by the use of high intensity ultraviolet lamps. The wastewater is treated to high levels that meet and exceed water quality standards. The reclaimed water is discharged into a unnamed tributary of the Neuse River Basin under the National Pollutant Discharge Elimination System (NPDES) permit number NC0064050. This permit is



Neuse River Basin

issued to the Town of Apex by the State of North Carolina under the authority of the US Environmental Protection Agency.

**Biosolids Program:** Biosolids are the nutrient-rich organic materials resulting from the treatment of domestic sewage at a wastewater treatment facility. Through biosolids management, solid residue from the wastewater treatment is processed to reduce or eliminate pathogens and minimize odors, forming a safe, beneficial agricultural product. Farmers and gardeners have been recycling biosolids for ages. Bio-solids can be applied as fertilizer to improve and maintain productive soils and stimulate plant growth.

Biosolids contain valuable nutrients such as nitrogen, phosphorus,

calcium and micronutrients like zinc and copper, which are essential to plant growth. Recycling biosolids on farmland remains the most cost effective and environmentally safe method for the Town to manage its biosolids. The Town has approximately 1,500 acres of farm land available under this permit. Biosolids generated at the WRF are stabilized in aerobic digesters. The organic reduction meets the Class B requirements set forth by the State of North Carolina Division of Water Quality. This fiscal year about 254 dry tons were added to farmland as soil amendments and fertilizer in accordance with the Town's Land Application permit.

**Staffing:** Operation of the WRF and the Collection System is provided by the Public Works and Utilities Department. There are twenty-two employees that provide day-to-day operation and 24-hour response to all WRF and Collection System emergencies. Employees are certified by the State of North Carolina for proficiency in plant operation, pump station maintenance, collection system repair, land application, water reuse, laboratory analysis, and pretreatment management.

## Laboratory and Pretreatment Program

**Laboratory:** The Water Reclamation Facility maintains a certified analytical laboratory approved by the State of North Carolina and the EPA. The laboratory is certified to perform environmental analysis and report monitoring data to the Division of Water Quality for compliance with NPDES effluent, surface water, groundwater, and pretreatment regulations under the laboratory certificate number 267. This year, over 41,000 analyses were performed for process control, stream monitoring, and compliance requirements. The data

reported during this fiscal year (2010– 2011) was in compliance with the NPDES permit.

**Pretreatment:** The purpose of the pretreatment program is to protect the WRF. Industrial wastewater discharges are monitored through the program. Specific permits are issued to each industry specifying maximum amounts of pollutants that may be discharged to the sewer system. The Staff conducts routine monitoring and inspection of these industries to ensure compliance. The Town's Oil

and Grease program requires the inspection of all commercial, institutional and industrial facilities that utilize oil/grease separation units. We require food preparation and service facilities to control fats, oils and grease with properly sized grease interceptors and regular grease trap cleanings. The inspects restaurants, institutions such as schools, churches and nursing homes, grocery stores and convenience stores to ensure compliance with the Town's Sewer Use Ordinance.

**WASTEWATER  
DATA  
2010 – 2011**

| Month            | Flow<br>MGD |        | Biochemical<br>Oxygen<br>Demand<br>MG/L |        | Ammonia<br>MG/L |        | Total<br>Suspended<br>Solids<br>MG/L |        | Fecal<br>Coliform #<br>/100ML |        | Dissolved<br>Oxygen<br>MG/L |        | Total<br>Nitrogen<br>MG/L |        | Total<br>Phosphorus<br>MG/L |        |
|------------------|-------------|--------|---|--------|-----------------|--------|--------------------------------------|--------|-------------------------------|--------|-----------------------------|--------|---------------------------|--------|-----------------------------|--------|
|                  | Limit       | Actual | Limit                                   | Actual | Limit           | Actual | Limit                                | Actual | Limit                         | Actual | Limit                       | Actual | Limit                     | Actual | Limit                       | Actual |
| <b>July</b>      | 3.6         | 2.231  | 5                                       | 2.21   | 1.0             | <0.10  | 30                                   | <2.50  | 200                           | 3      | >5                          | 7.5    | **                        | 3.14   | 2*                          | 0.943  |
| <b>August</b>    | 3.6         | 2.624  | 5                                       | <2.00  | 1.0             | <0.10  | 30                                   | <2.50  | 200                           | 2      | >5                          | 7.6    | **                        | 3.48   | 2*                          | 1.24   |
| <b>September</b> | 3.6         | 2.342  | 5                                       | 2.58   | 1.0             | <0.10  | 30                                   | <2.50  | 200                           | 2      | >5                          | 7.5    | **                        | 3.62   | 2*                          | 0.864  |
| <b>October</b>   | 3.6         | 2.327  | 5                                       | <2.00  | 1.0             | <0.10  | 30                                   | <2.50  | 200                           | 2      | >5                          | 8.1    | **                        | 3.96   | 2*                          | 1.16   |
| <b>November</b>  | 3.6         | 2.146  | 10                                      | <2.00  | 2.0             | <0.10  | 30                                   | <2.50  | 200                           | 1      | >5                          | 8.4    | **                        | 3.98   | 2*                          | 0.504  |
| <b>December</b>  | 3.6         | 2.238  | 10                                      | 2.73   | 2.0             | <0.10  | 30                                   | <2.50  | 200                           | 2      | >5                          | 8.9    | **                        | 5.42   | 2*                          | 0.339  |
| <b>January</b>   | 3.6         | 2.300  | 10                                      | 3.65   | 2.0             | <0.10  | 30                                   | <2.50  | 200                           | 2      | >5                          | 9.7    | **                        | 5.52   | 2*                          | 0.646  |
| <b>February</b>  | 3.6         | 2.279  | 10                                      | 3.04   | 2.0             | 0.101  | 30                                   | <2.50  | 200                           | 1      | >5                          | 9.4    | **                        | 5.04   | 2*                          | 0.910  |
| <b>March</b>     | 3.6         | 2.113  | 10                                      | 2.87   | 2.0             | 0.807  | 30                                   | <2.50  | 200                           | 2      | >5                          | 9.0    | **                        | 6.09   | 2*                          | 1.36   |
| <b>April</b>     | 3.6         | 2.289  | 5                                       | 3.29   | 1.0             | 0.115  | 30                                   | <2.50  | 200                           | 2      | >5                          | 8.5    | **                        | 4.20   | 2*                          | 0.815  |
| <b>May</b>       | 3.6         | 2.201  | 5                                       | 2.08   | 1.0             | 0.380  | 30                                   | <2.50  | 200                           | 3      | >5                          | 7.8    | **                        | 4.85   | 2*                          | 0.723  |
| <b>June</b>      | 3.6         | 2.022  | 5                                       | <2.00  | 1.0             | 0.464  | 30                                   | <2.50  | 200                           | 1      | >5                          | 7.8    | **                        | 4.34   | 2*                          | 1.43   |

Million Gallons a Day (MGD)      Milligrams per Liter (MG/L)      Milliliter (ML)      \*\* Yearly lbs. limit (40,547 lbs.)      \* Quarterly avg. limit (2.0)

The Town's Water Reclamation Facility treats wastewater 24 hours a day, 7 days a week, 365 days a year. We are proud to report during the past fiscal year, the facility removed pollutants (BOD, TSS, NH-3) with an average efficiency of 99.1%. The Facility treated over 824 million gallons of wastewater and met all monitoring data requirements and sampling frequencies set forth in the National Pollutant Discharge Elimination System permit.

- Total nitrogen pounds (lbs) discharge for fiscal year: 30,603 lbs/year
- Quarterly average for Phosphorus (mg/l) : 0.918 mg/l / qt avg.

**COLLECTION INFORMATION 2010 – 2011**

**Collection System**

The Town's wastewater collection system consists of approximately 186.5 miles of pipe. There are 157 miles of gravity sewer and 29.5 miles of force main pipe. The Town also owns and maintains 20 pump stations. The pump stations are equipped with automated controls, standby power, audible/visible alarms, and programmable telephone dialers. All stations are checked daily by the Wastewater Collection System staff. These pump stations operate 24 hours a day, seven days a week, 365 days a year. The Town's collection system operates under the permit number WQCS 00064 issued by the State of NC.

minimize or to prevent spills, the Collection system staff uses video equipment for inspections and incorporates routine flushing for preventive maintenance. In addition, the Town has a rapid response program with 24-hour on call personnel to help mitigate spills.

The staff inspects and cleans at least 10% of sewer lines each year. During the past fiscal year, over 107,602 linear feet of sewer lines were cleaned by flushing, and 72,109 feet were inspected by remote video.

This year we've been busy replacing/repairing pipe using a method called slip lining or **Cured-In-Place Pipe (CIPP)**. This is a jointless, seamless pipe within-a-pipe with the capability to rehabilitate pipes ranging in diameter from 6-110 inches. A resin-saturated felt tube made of polyester is inverted or pulled into a damaged pipe. Little to no digging is involved in this trenchless process, making for a more environmentally friendly method than traditional "dig and replace" pipe repair methods. About 3,088 feet of pipe was slip-lined in the areas of Ellington, Knowlwood, Brooklyn, and James St.

This fiscal year we had four spills (**SSO**) to report.

- Incident occurred 7/27/10. Location: Waterford Green pump station. Estimated spill amount: 6,500 gallons. Cause: Inflow and infiltration, over five inches of rain in one hour. No adverse effects on nearby creek.
- Incident occurred 7/27/10. Location: Perry Farms pump station. Estimated spill amount: 19,000 gallons. No adverse effect on nearby stream. Cause: Inflow and infiltration, five inches of rain in one hour
- Incident occurred 8/4/10. Location: Summit Lake Apartments. Cause: excessive grease buildup in sewer pipe, caused a partial blockage. Estimated spill amount: 13,500 gallons. Clean up involved placing lime around contaminated area. No adverse effects on the receiving creek.
- Incident occurred 4/12/11. Location: E. Williams St. Cause: excessive grease and tree roots, in sewer pipe caused a partial blockage. Estimated spill amount: 600 gallons. Clean up involved placing lime around contaminated area. No adverse effects on nearby creek.



**Videoting sanitary sewer lines help prevent spills. We inspected over 72,000 feet of our collection system this fiscal year.**

**Sanitary Sewer Overflow (SSO)**

SSOs occur when problems in the system cause sewage to come out of manhole covers, service clean outs or plumbing fixtures. Everyday millions of gallons of wastewater begin the journey from kitchen sinks, bathtubs, toilets, washing machines, and dishwashers in homes and businesses, and travels through the collection system to the Water Reclamation Facility. The Town strives to have zero spills from our collection system. In an effort to

**Grease Control**

Did you know each year there are more than 15,000 sewer overflows in North Carolina? Many of these overflows are directly related to the improper disposal of oil and grease in kitchen drains. Grease congeals on sewer pipes, which causes wastewater to flow back into homes and businesses or directly into waterways.

materials, such as grease and other household items and debris from entering the sewer system. The Town's Oil and Grease Program is designed to limit illegal discharges of fats, oil, and grease from homes and business into the wastewater collection system. Small amounts of grease entering the collection system can accumulate over time to cause blockages resulting in an SSO which can harm the environment and cost thousands of dollars to clean up. We strive to maintain the sewer infrastructure at the highest quality and

provide exceptional service.

**You can help too.**

- Please put used oil and cooking grease in collection containers for proper disposal.
- Remove oil and grease from kitchen utensils with scrapers or paper towels.
- Place food scraps in trash containers.

We can work together to achieve our goal; providing you with reliable service and protecting our lakes and streams.

**Easements**

**What is a Public Utility Easement?**

This is a legal document that conveys limited property rights from the Grantor (Property Owner) to the Grantee (Town of Apex). This document is recorded in the Wake County Register of Deeds. A Public Utility Easement creates a non-exclusive, perpetual right to use a portion of your property for Public Utility purposes. This provides the Town with access rights to repair, replace, test, inspect, enlarge, change, maintain and/or remove the Public Utility located within the easement.

**Easement?** The property owner continues to own the land and only gives up defined rights on the portion of your land used for the easement. Maintenance of the property within the easement is the responsibility of the property owner.

**Can I make improvements within the Easement?** Easements are typically granted to the Town with the understanding that the property owner may make improvements to the area such as irrigation, fences and furniture. As part of the agreement, the Town is permitted to remove any of these improvements for the purpose of

maintaining and/or replacing the Public Utility.

**What does this mean to me?**

Do not place objects on manhole covers. Fences are not permitted to be installed inside easements without Public Works and Utilities Department approval. Gates fourteen feet wide may be required. No permanent structures are to be erected within the easement. Keep the easement clear of debris and material, especially around manhole access points. Planting of trees and shrubs within the easement is not permitted without permission.

**Who owns and maintains the**

*Placing grease in its proper place can help prevent Sanitary Sewer Overflows.*



**Maintenance of the property within the easement is the responsibility of the property owner.**

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2010 – 2011



Western Wake Partners  
Regional Wastewater  
Management Facilities

The Towns of Apex, Cary, and Morrisville (Western Wake Partners) have been working in partnership for years to ensure adequate wastewater treatment capacity for the region's future. This joint effort to study, locate, design, permit, and construct the Western Wake Regional Wastewater Management Facilities (WWRWMF) is anticipated to conclude in August 2014.

On April 13, 2011, NCDENR Construction Grants & Loans granted authorization for the Partners to construct the new 18 MGD Western Wake Water Reclamation Facility. With this authorization, the Partners advertised for bids for Contract I, Treatment Works. The bids for WWRWMF Contract I were opened on June 15, 2011.

The Partners' commitment to community outreach during the entire process ensures that focused attention is given to neighboring communities as facilities are constructed and operated. For continued updated information, please visit: [www.westernwakepartners.com](http://www.westernwakepartners.com). If you have any other questions or concerns about the project, please contact the Apex Public Works Department at 919-249-3427.

**System Operator:**

Town Of Apex Public Works  
and Utilities Department

**Contact Information:**

Tim Donnelly, PE

Public Works and Utilities

Director

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Town of Apex Public  
Works and Utilities  
Department

Apex, North Carolina,  
The Peak of Good Living



Flows to the stormwater system (through curbs on the edge of the street and through stormwater inlets) usually go to the nearest creek, stream, or lake. (Neuse River pictured above.)

**Illicit Discharge Basics**

**Is Stormwater treated at a treatment plant?**

No! The storm sewer system is often confused with the sanitary sewer system. In Apex, these are two distinctly separate systems. Flows to the sanitary sewer system (e.g. flushing toilets, shower drains, kitchen sink drains, etc.) are treated at the Apex Water Reclamation Facility. Flows to the storm water system (through curbs on the edge of the street and through stormwater inlets) usually go to the nearest creek, stream, or lake and do not receive treatment at a plant.

**What is an illicit discharge?**

An illicit discharge is the release of pollutants or non-stormwater materials to the stormwater system. The result is untreated discharges that contribute high levels of pollutants including heavy metals, toxins, oil and grease, solvents, nutrients, viruses, and bacteria to receiving water bodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

**What is Apex doing about illicit discharge detection and elimination (IDDE)?**

In 2008, the Town of Apex adopted an ordinance to establish an IDDE program including a provision for assessing civil

penalties on violators. Environmental Programs personnel investigate illicit connections and improper disposals to the Town's stormwater system. Examples of such investigations include someone dumping paint or yard debris into a storm drain or creek, or a spill of a hazardous material that enters the stormwater system.

**What can I do?**

You can do your part by keeping all non-stormwater materials away from and out of all curb inlets, grates, and water bodies in Town. You can also report illicit discharges.

**IDDE Reporting**

*How do I report an illicit discharge?*  
To report an illicit discharge in Town, please call Public Works at 249-3427. Many environmental problems can be resolved as a result of these investigations. You can make a difference by calling!

*What do I say when I call?*

Please have the following ready when you call:

1. Your name and contact information (if you would like a follow-up call).
2. Location of the incident.
3. When you witnessed the incident (date and time).
4. What materials were involved in the incident.

**What happens after I call?**

Once you report an illicit



Apex staff sampling stormwater

discharge, the information is recorded in our database. An Environmental Programs staff member will investigate and take samples as necessary. Per the IDDE ordinance, a civil penalty may be issued depending on the severity of the incident.

**Storm Drain Marking**

The Town of Apex Storm Drain Marking Program is a great hands-on opportunity for volunteers to help educate their community about the importance of stormwater pollution prevention.

The program allows volunteers to adhere watershed specific markers on storm drains to remind citizens that storm water runoff can wash pesticides, fertilizers, pet waste, litter, oil and other automotive fluids, sediment, and household chemicals in to our valuable creeks, rivers, and lakes. Call Public Works at 249-3427 to schedule an event.

