



Sewer Collection and Wastewater Treatment Facilities Report for FY 2009-2010 (July 1, 2009 through June 30, 2010)

Over the first two years of the Cape Fear Public Utility Authority has realized many successes, particularly in the Authority's collection and treatment systems. Accomplishments include award-winning expansion and improvements completed at the Northside Wastewater Treatment Facility which enhanced the treatment process, expanded the treatment capacity and addressed odor concerns from the surrounding community. New sewer lines are continually being installed to replace sewer lines that are antiquated and failing, with some projects to include Princess Place Drive, Wrightsville Avenue, Front Street, and Kerr Avenue where aggressive rehabilitation and /or replacement projects have taken place over the last year. And pump stations, vital components of the wastewater system, are being maintained in the most effective manner to prevent financially and environmentally costly overflows. Just this past year, maintenance crews identified, planned and executed critical repair and replacement needs at the Hewletts Creek Pump Station 34, one of our larger stations, to minimize the potential for overflows.

The Authority is continuing to evaluate the sewer system and to identify needs and methods of repair based on the preservation of public health, protection of the environment and controlling costs to our customers. The guiding principles of the Authority are *Stewardship, Service, and Sustainability*. These principles are at the core of each decision made within the Authority and is guiding how we move into the future.

Matthew W. Jordan, PE
Chief Executive Officer

Questions, comments, or requests for additional copies of this report should be directed to the Cape Fear Public Utility Authority Customer Service Department at (910) 332-6550.

This report is available for viewing at the Cape Fear Public Utility Authority Customer Service Office or by logging onto our web-site at www.cfpua.org. Customers will be notified of its availability by printed notice on water and sewer bills. This report was completed by staff of the Cape Fear Public Utility Authority and is accurate to the best of our knowledge and belief.

Persons listed with corresponding facilities were designated as the "Operators in Responsible Charge" (ORC) of the respective systems.

Sweeney Water Treatment Plant
Permit No. NC0002879
ORC Bradley V. Jones
(910) 332-6739

NHC Water Treatment Plant
Permit No. NC0088307
Michael Richardson
(910) 332-6739



James A. Loughlin (Northside) Wastewater Treatment Plant
Permit No. NC0023965
ORC Geoffrey D. Cermak
(910) 332-6736



M'Kean Maffitt (Southside) Wastewater Treatment Plant
Permit No. NC0023973
ORC Milton S. Vann
(910) 332-6735



Walnut Hills Wastewater Treatment Plant
Permit No. NC0039527
ORC Carol D. Shidal
(910) 512-9481



Utilities Collection System Manager
Permit No. WQCS00012
ORC Robert Daughtry
(910) 332-6637

System Overview

CFPUA's sewage collection and wastewater treatment facilities provided service to homes, commercial establishments, and industries. For fiscal year 2009-2010 there were approximately 61,404 connections through which an average of 16.77 million gallons of wastewater traveled each day. This wastewater was collected, treated, and then discharged back into the Cape Fear River. The Authority also treated wastewater from Pender County and the Town of Wrightsville Beach.

Wastewater was treated at either of three facilities: the James A. Loughlin, the M'Kean Maffitt, or the Walnut Hills plants. The James A. Loughlin Plant (Northside Plant), located at 2311 North 23rd Street, is permitted to treat up to 10 million gallons of wastewater daily, the M'Kean Maffitt Plant (Southside Plant), located at 3436 River Road, is permitted to treat up to 12 million gallons daily and the Walnut Hills Treatment Plant is permitted to treat up to 100,000 gallons daily.



Each wastewater treatment plant uses physical, chemical, and biological processes to clean the wastewater. Screening and settling processes help remove most suspended materials. Biological processes, utilizing bacteria, aid with removing the remainder of the suspended materials and the dissolved substances. Leftover organic material undergoes further treatment at each plant. These nutrient-rich biosolids are used by local farming operations as soil amendment.

The Cape Fear Public Utility Authority is responsible for the daily operation of these facilities and with ensuring compliance with strict environmental standards. During this report period, operational wastewater expenditures of approximately \$10,331,190 were funded by customer's bimonthly user charges.

Wastewater Treatment Plant Influent & Effluent (before and after treatment)



Plant Performance

The Cape Fear Public Utility Authority treatment plants operated under NPDES permits. These complex permits include monitoring requirements and discharge limits. Some vary with seasons and have different maximums for daily values, weekly averages, monthly averages, and quarterly averages. Limits are set by the N.C. Department of Environment and Natural Resources to protect the streams receiving our discharges. Permits can be reviewed at our plants upon request.

In compliance with these permits, the CFPUA's laboratory conducted 32,620 lab analyses during this report period. Any one of these tests could have resulted in a value that caused us to violate the limits of the NPDES permit. A violation would also result if a sample was not taken at its specified time, was accidentally dropped, or was allowed to linger longer than permitted before refrigeration and testing.

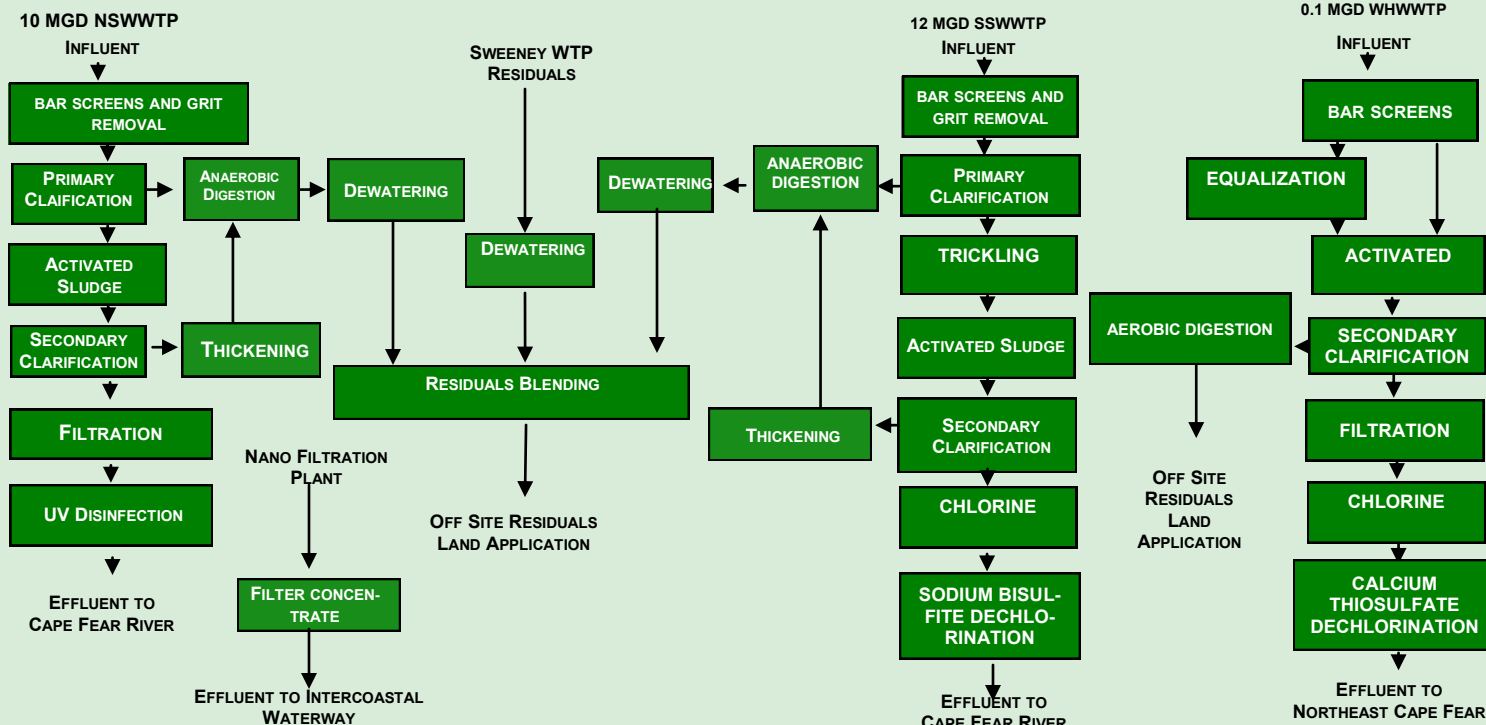
During this report period, the Cape Fear Public Utility Authority treated about 6.12 billion gallons of wastewater and returned it to our streams. Comparing all numerical limits within the NPDES permits with all corresponding measurements, the CFPUA achieved 100.0% compliance overall.

Staff Training & Certification

Wastewater collection and treatment facilities require highly-skilled staff to operate and maintain them effectively and efficiently. Wastewater treatment and collection personnel are certified through the Water Pollution Control System Operators Certification Commission and are governed by N.C. State law and regulations administered through NCDENR. To become certified, one must have suitable education and experience, must satisfactorily complete required coursework, and must pass a state-administered examination. In addition to initial certification, wastewater operators are required to attend six hours of continued education annually to maintain each certification they possess.

During the period covered by this report, the Wastewater Treatment Division was authorized to staff 40 full-time permanent positions. Of those, 30 staff members possessed wastewater system certifications. The Utility Services Division had 55 employees dedicated to line maintenance and wastewater collection, and 22 staff members possessed wastewater system certifications.

REPRESENTATION OF THE CAPE FEAR PUBLIC UTILITY AUTHORITY'S WASTEWATER



Water Treatment Plants

The Cape Fear Public Utility Authority operates two water treatment plants totaling 33.5 million gallons per day of water treatment. Sweeney WTP, which is currently capable of producing water at the rate of 27.5 million gallons per day, withdraws water from the Cape Fear River above U.S. Lock & Dam #1 in Bladen County. Raw water from the river is pumped 23 miles to the plant where it is treated and cleaned before being pumped into the distribution system. A majority of the suspended material and organic matter that is removed from the raw water during treatment is condensed, thickened and is transferred by pipeline into a holding tank at the James A. Loughlin Wastewater Treatment Facility where it undergoes additional treatment. To be as efficient as possible, a majority of the water produced during the thickening and clarification process is "recycled" back to the head works of the plant and combined with the raw water coming from the Cape Fear River while the remainder is discharged into the Cape Fear River under the requirements of our NPDES (National Pollution Discharge Elimination System) permit. Solids created during the production of drinking water are sent to the wastewater plant where they are dewatered as much as possible before being land applied at several sites within surrounding counties. A new nano-filtration membrane treatment plant is currently producing up to 6 million gallons of softened and treated water to serve approximately 15,000 CFPUA customers in the northern part of New Hanover County. Groundwater, taken from both the Castle Hayne and Upper Pee-Dee aquifers, is the source of water for this treatment plant, and once filtered provides these customers with a high quality and reliable drinking water source. The filtered concentrate is then discharged into the Intracoastal Waterway under a NPDES permit. Daily flows at both plants are recorded and effluent monitoring is performed according to permit requirements.

Collection System

Did you know?

- The Cape Fear Public Utility Authority operates a sewage collection system comprised of approximately 840 miles of gravity line, 20,315 manholes, 142 pump stations, and 500 miles of pressurized sewage force main.

- The Cape Fear Public Utility Authority cleans and maintains over 1300 miles of sewer main right-of-ways.

How do spills happen?

There are several possible causes of sewer overflows. Tree roots can find their way into sewer lines and create obstructions. Foreign objects can be dropped in sewers and manholes. The flushing of non-biodegradable materials down the toilet has become a significant cause of service main stops. Roots from trees and other vegetation can enter sewer lines causing the lines to stop up completely or partially. Excessive rainfall can cause overloading of sewer lines or pump stations.

The single most common cause of overflows is sewer pipes blocked by grease that result in raw sewage over-flowing into parks, yards, and streets. The cleanup causes increased operation and maintenance costs which impacts all people within the service area.

The Utility Services Division clears obstructions such as the ones listed above on service lines using its jet trucks and combination jet and vacuum trucks. During the reporting period the division handled 138 main stops and 865 sewer service calls .

Our crews are available 24-hours a day, 365 days per year to prevent and respond to sewer service blockages, overflows and other emergencies

It should be noted that of the 6.12 billion gallons of sewage treated by the Authority during this reporting period, approximately 99.998 % of the sewage that entered into the system was successfully treated and returned safely to the environment.

Please call the Cape Fear Public Utility Authority Operations Division to report a sanitary sewer blockage or overflow by calling our 24-hour emergency number at 910-332-6565.



Where does the grease come from?

A byproduct of cooking, grease comes from meat fats, lard, oil, shortening, butter, margarine, food scraps, baking goods, sauces, and dairy products. When washed down the sink, grease sticks to the insides of sewer pipes located on your property and in the streets. Over time, it can build up and block the entire pipe.

What can you do to help?

1. Never pour grease down sink drains or into toilets; instead put grease in a collection container, such as a Fat Trapper. Call Cape Fear Public Utility Authority Environmental Compliance at 332-6558 to order a Fat Trapper;
2. Scrape grease and food scraps into a can or the trash for disposal or recycling where available;
3. Put baskets/strainers in sink drains to catch food scraps and other solids, and empty them into the trash;
4. Put materials like wipes, napkins, cat litter, cotton balls, and feminine hygiene products in the trash. While they may say 'flushable,' these materials will not break down as they should and can cause serious problems in your sewer lines and in the system; and
5. Speak with your friends and neighbors about how to keep grease and other materials out of the sewers.

Ways we are helping...

1. Our root control program uses both non-toxic chemical root control methods and mechanical equipment to remove roots from the system.

2. We replace and refurbish old, leaking lines and manholes to reduce the amount of rainwater entering the collection system. During this reporting period, our crews replaced or rehabilitated 2560 feet of sewer line.

3. We have an on-going cleaning and inspection program to monitor and maintain our sewer system, including jetting, high pressure washing, and closed circuit television inspection of lines. During this Fiscal Year:

- 160.8 miles of sewer lines were cleaned which is 9.1% more than the collection system permit requires.
- Approximately 50.9 miles of the gravity system were videoed by closed circuit television to evaluate its condition and to identify the need for further maintenance.

4. Environmental Stewardship is a fundamental philosophy and guiding principal of CFPUA. Due to the commitment by the Authority Board and staff to develop an environmental management system, we were recognized as an Environmental Partner in the North Carolina Department of Environment and Natural Resources' Environmental Stewardship Initiative (ESI) by NCDENR Secretary Bill Ross in December of 2008. We are continuing to actively participate in this program. This program is designed to promote and encourage superior environmental performance, proactive environmental management and continual improvement.

We are implementing an environmental management system based on the ISO 14001 international standard. This system is based on the Plan-Do-Check-Act management model that drives continual improvement. Implementation of this system will provides a formal process that will enable staff to better analyze, control and reduce the environmental impact of our activities and operate more effectively and efficiently.

2009/2010 Highlights

Ogden Interceptor Replacement Update

The Ogden Interceptor is a portion of the collection system that carries on average 4 MGD of sewage from the Northern portions of New Hanover County along the Smith Creek Watershed to the Northside Wastewater Treatment Plant. During this reporting period, multiple failures have occurred on this sewer line; therefore, the process of replacing the entire 8,500 linear feet of sewer pipe began.

On March 12, 2010, the CFPUA Board of Directors declared the situation of the multiple and imminent failure of this entire line a special emergency and authorized contracts to be approved to begin its replacement. Work began to replace the first section of line near the intersections of Kerr Avenue and Grathwol Drive the same month. Beginning in August 2010, the remaining portion of the line is in the process of replacement and the entire project should be completed by the end of 2010. The replacement of this sewer line will minimize its potential for environmental impact within this watershed and increase the reliability of providing this vital service for our customers in Northern New Hanover County into the future.



Capital Improvement Plan (CIP) Update

A critical component of CFPUA's long term planning is the development of a ten year capital improvement program (CIP). Early on, we established our guiding principles of Stewardship, Sustainability and Service that represent our business philosophy, defines our organization and guides our daily activities. Several documents influence our CIP and among these are the approved CFPUA Strategic Plan and the draft Integrated Water Resources Master Plan. These documents provide an overarching summary of issues facing the Authority and, when adopted, will offer long term policy guidance. Developing a long term CIP is arguably the Authority's most important undertaking to date. The expansion and upgrade of the Southside Wastewater Treatment Plant from 12 million gallons per day to 16 million gallons per day is one example of the many capital improvement projects that CFPUA is undertaking. A new aeration basin, tertiary filtration, and UV disinfection are some of the new processes being added and existing facilities will be upgraded to provide improved wastewater treatment. By undertaking projects to increase our system capacity and improve our treatment capabilities, the Authority is positioning itself to handle the future demands of our growing region.

Planning for the Future

- The CFPUA will be designing and constructing wastewater facilities to meet projected demand requirements in response to growth in the City and County.
- The Authority and Pender County have begun design on a wastewater treatment plant to serve portions of the US 421 corridor in New Hanover and Pender counties. Construction on this plant should begin in late 2011.
- The Authority will continue the installation of a new force main from Pump Station 35 to the Northside Wastewater Treatment Plant to provide additional flexibility in flow management and increased capacity for the collection system.
- The Authority will be decommissioning the Walnut Hills Wastewater Treatment Plant and rerouting sewage to the recently upgraded Northside Wastewater Treatment Plant. The Walnut Hills plant has served portions of northern New Hanover County for 40 years.

Asset Management

The Authority is developing an Enterprise Asset Management Plan to implement a proactive approach to the management, operation, and maintenance of the treatment plants, wastewater collection system, and water distribution system. The Plan will guide the acquisition, use and disposal of infrastructure assets to optimize service delivery and minimize cost. Understanding the system performance, system characteristics, changing conditions, and operation and maintenance practices will help guide our management program to minimize the need for costly emergency responses and help prevent problems from occurring.

Focus areas of the program are maintenance strategies, customer/community/stakeholders, employee development, environment, financial performance, and organizational development. A Computerized Maintenance Management System will be the first step in our Enterprise Asset Management Plan, and it will be operational by December 2010. The program vision statement: To be a professional organization providing industry leading water and wastewater Stewardship, Sustainability and Service.

Contact Us

Information (910) 799-6064
Customer Service & Billing (910) 332-6550
Emergencies / Reporting Sewer Spills (910) 332-6565

Customer service and payment centers are at the CFPUA Administration Building located at 235 Government Drive and at 305 Chestnut Street. For more information about the Authority, customers can call (910) 799-6064 or visit the Authority's website at www.cfpua.org.

Programs designed to better serve you...

Odor and Corrosion Control

Nuisance odors are prevented by passing fumes through granular activated carbon. Hydrogen peroxide is injected into wastewater to control odor production and corrosive action. Extended field trials have identified alternate products suitable for use within the CFPUA system. The Authority is currently designing and installing a new dosing network, enable a much broader range of potential products to be fed from a broader range of candidate dosing locations, ensuring a more effective and efficient operation. Together with the new dosing network, overhauling the odor corrosion control program contract to permit a more competitive bidding environment and better overall value will provide a more economical solution to system odor and corrosion control.

Coastal Environment

Planned improvements to the treatment plants will expand capacity to support new customers and improve the quality of effluent to the Cape Fear River.

Lower Cape Fear River Program

CFPUA takes an active role in organizations that are dedicated to preserving the quality of our waterways. CFPUA's representatives served on a stakeholder committee participating with State representatives in investigating solutions to low dissolved oxygen within the Cape Fear River estuaries through imposition of Total Maximum Daily Loads (TMDLs).

Safety

CFPUA's safety committee has remained active at all levels to provide a safe work environment for its employees. CFPUA was recently recognized by the North Carolina Department of Labor for outstanding safety achievement and health efforts contributing to reductions in injuries and illness and for promoting safer working conditions.

Residuals Management

Solids produced by wastewater processing are referred to as residuals or, when returned to the soil, biosolids. Residuals have beneficial amendment and nutrient value when recycled in this manner. CFPUA could produce two types of residuals: Class A product available for general public use as a soil additive/amendment; and Class B product suited for incorporation into the soil by land application as an additive/amendment. Approximately 2,764 acres in New Hanover, Brunswick, Pender, Columbus, and Bladen counties have been permitted to receive Class B residuals. During this report period, CFPUA processed 21,976 cubic yards of residuals.